

2016 Abstracts

33rd Annual Meeting of the American Society for Metabolic and Bariatric Surgery

Presented at

SM
ObesityWeek 2016

October 31 – November 4, 2016

Ernest N. Morial Convention Center

New Orleans, Louisiana



About the American Society for Metabolic and Bariatric Surgery

The ASMBS is the largest national society for this specialty. The vision of the Society is to improve public health and well-being by lessening the burden of the disease of obesity and related diseases throughout the world.

Founded in 1983, foremost American surgeons have formed the society's leadership and have established an excellent organization with educational and support programs for surgeons and integrated health professionals. The purpose of the society is to advance the art and science of metabolic and bariatric surgery by continually improving the quality and safety of care and treatment of people with obesity and related diseases by:

- Advancing the science of metabolic and bariatric surgery and increase public understanding of obesity.
- Fostering collaboration between health professionals on obesity and related diseases.
- Providing leadership in metabolic and bariatric surgery the multidisciplinary management of obesity.
- Advocating for health care policy that ensures patient access to prevention and treatment of obesity.
- Serving the educational needs of our members, the public and other professionals.

About ObesityWeekSM

ObesityWeeksm is a unique, international event focused on the basic science, clinical application, surgical intervention and prevention of obesity. Co-locating both TOS and ASMBS annual meetings brings together world-renowned experts in obesity to share innovation and breakthroughs in science unmatched around the globe. Attendees will enjoy the diverse educational opportunities, networking events, and scientific synergies created through the collaboration of these leading obesity organizations.

2016 ASMBS Program Committee

The Program Committee is responsible for developing and arranging all of the annual educational events for the ASMBS with the annual conference being the primary educational event. The committee identifies needs, professional gaps, and barriers; reviews and grades submitted abstracts; selects relevant topics and educational design; secures guest speakers; contributes to the development of overall conference programming.

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Future Obesity Week Event Dates

2017

**Washington, DC | Oct. 29 – Nov. 2
Gaylord National Convention Center**

2018

**Nashville, TN | Nov. 12 – Nov. 16
Music City Center**

2019

**Las Vegas, NV
Mandalay, Bay**

Educational Overview and Information

Purpose

The American Society for Metabolic and Bariatric Surgery is committed to providing tools for physicians and integrated health professionals as they participate in the Maintenance of Certification program, a lifelong learning process which includes areas of self-assessment and quality improvement of practice performance by physician specialists. Presentations of papers submitted from the most current research, as well as invited lecturers, promote the exchange of information and experiences between those practiced in bariatric surgery and newcomers to the field. The Scientific Session is offered as a culmination to the selection of courses presented in various learning formats designed to meet the needs of the learner. The primary goal is continual improvement in the competence and performance of those in the field of bariatric surgery which will result in improved patient outcomes.

Target Audience

The conference is designed for all clinical and academic surgeons and support staff, including any health professional involved in the care of the patient with obesity, who wish to increase their knowledge of the surgical and perioperative management of the patient with obesity. The conference is also designed for those seeking practical pearls and hands-on experience to modify their practice and thereby achieve more favorable patient outcomes.

Educational Objectives

Upon completion of this conference, physicians and support staff should be able to:

- Define, discuss and solve specific challenges in the treatment of patients who suffer from obesity and obesity-related and metabolic diseases and conditions
- Describe the development and use of new techniques to achieve weight loss by surgery in patients with obesity
- Examine the broad scope of patient care services
- Identify the specific needs of bariatric patients and assist in targeting their care in a coordinated multidisciplinary team effort

Accreditation Statements

The American Society for Metabolic and Bariatric Surgery (AMSBS) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The American Society for Metabolic and Bariatric Surgery designates this educational activity for a maximum of 38.75 AMA PRA Category 1 Credit(s)TM.

Physicians should only claim credit commensurate with the extent of their participation in the activity.

Nursing Credits (up to 38.0 CE contact hours) are provided by Taylor College, Los Angeles, California (possibly may not be accepted for national certification.)

APA and NASW credits for the ASMBS Masters in Behavioral Health Course are pending. This course is co-sponsored by Amedco and the American Society for Metabolic and Bariatric Surgery (ASMBS).

Educational Disclaimer

The primary purpose of this conference is education. Information presented, as well as publications, technologies, products, and/or services discussed, are intended to inform you about the knowledge, techniques and experiences of bariatric surgeons who are willing to share such information with colleagues. A diversity of professional opinions exists in bariatric surgery, and the views of the conference's faculty are offered solely for educational purposes. Faculty's views neither represent those of the ASMBS nor constitute endorsement by the Society. The ASMBS disclaims any and all liability or damages to any individual attending this conference and for all claims, which may result from the use of information, publications, technologies, products, and/or services of the meeting. Faculty disclosure statements have been requested from the speakers and will be presented in the conference materials.

Paper Sessions

* Presentation under consideration for the John Halverson Young Investigator Award

Wednesday, November 2, 2016

Paper Session I: TOP PAPERS AND VIDEOS

10:15am–12:00pm

- 10:20am** **A101-Decreasing Readmissions through Opportunities Provided (DROP): The First National Quality Improvement Collaborative from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP)**
 Main Presenter: John M Morton, MD MPH FACS FASMBS
 Co-Authors: Kristopher Huffman; Teresa Fraker; Cliff Ko, MD; Anthony T Petrick, MD FASMBS; Stacy A Brethauer, MD; Elizabeth Berger, MD; Jennifer Bradford, MFA
- 10:40am** **A102-Weight loss and comorbidities in revisional gastric bypass compared to a control group of primary gastric bypass. A population study from the Scandinavian Obesity Surgery Registry (SOReg).**
 Main Presenter: Stephan S Axer, MD
 Co-Authors: Ingmar Näslund, MD PhD; Eva Szabo, MD
- 11:00am** **A103-Post-Bariatric Surgery Hypoglycemia: Our Thirty Year Experience**
 Main Presenter: Alex D Michaels, MD
 Co-Authors: W. Brenton D French, BS; Jennifer Kirby, MD PhD; J. Hunter Mehaffey, MD; Matthew G Mullen, MD; Peter T Hallowell, MD; Bruce Schirmer, MD
- 11:20am** **A104-Incident Substance Use and Misuse among Adults following RYGB and LAGB: 7 Year Follow-up**
 Main Presenter: Wendy C. King, PhD
 Co-Authors: David R Flum, MD; Marcelo W Hinojosa, MD FACS; Jia-Yuh Chen, MS; Melissa Kalarchian, MS PhD; Gretchen E. White, MPH; Anita P Courcoulas, MD MPH; Samer G Mattar, MD FASMBS; Bruce M Wolfe, MD FASMBS; Gregory F Dakin, MD; Alfons Pomp, MD; Kristine J Steffen, PharmD PhD; Scott G Engel, PhD; James E Mitchell, MD; Walter J Pories, MD; Susan Z Yanovski, MD
- 11:40am** **A105-First Report from the American Society of Metabolic and Bariatric Surgery Closed-Claims Registry: Prevalence, Causes, and Lessons Learned from Bariatric Surgery Medical Malpractice Claims**
 Main Presenter: Eric J DeMaria, MD
 Co-Authors: Samer Mattar; Jaime Ponce, MD; William A Sweet, MD; Stacy A Brethauer, MD; Raul J Rosenthal, MD FASMBS; John M Morton, MD MPH FACS FASMBS; Ninh T Nguyen, MD; John Wilder W Baker, MD

Paper Session II: TOP PAPERS AND VIDEOS, cont.

1:30pm -3:30pm

- 1:30pm** **A106-Goals vs. Expectations: What Patients and Referring Physicians should know about who achieves a BMI < 30 kg/m² after Bariatric Surgery**
Main Presenter: Oliver A Varban, MD
Co-Authors: Carl Pesta, DO; Arthur M Carlin, MD; Amir A Ghaferi, MD MS; Ruth Cassidy, MS; Anne Cain-Nielsen, MS; Jonathan Finks, MD
- 1:50pm** **A107-Contraception and conception following Bariatric Surgery: 7 Year Follow-up**
Main Presenter: John M. Morton, MD
Co-Authors: Stacy A. Brethauer, MD; Jaime Ponce, MD; Raul J. Rosenthal, MD; Ninh T. Nguyen, MD
- 2:10pm** **A107 – SHORT-TERM OUTCOMES FOLLOWING CONVERSION OF ADJUSTABLE GASTRIC BANDING**
Main Presenter: Marie Menke
Co-Authors: Gabriella Gosman, MD; David R Flum, MD; Marie Menke; Gretchen E. White, MPH; Anita P Courcoulas, MD MPH; Wendy C. King, PhD; Jonathan Q Purnell, MD; Bruce M Wolfe, MD FASMBS; Gregory F Dakin, MD; Alfons Pomp, MD; Molly Orcutt, DO; Kristine J Steffen, PharmD PhD; Walter J Pories, MD; Susan Z Yanovski, MD
- 2:30pm** **A108-Factors that influence length of stay following bariatric surgery**
Main Presenter: Arturo Garcia, MD
Co-Authors: Mohamed R Ali, MD; Sahil P Parikh, DO; Aaron D Carr, MD
- 2:50pm** **A109-Long-Term (>10 year) Outcomes after Laparoscopic Roux-en-Y Gastric Bypass**
Main Presenter: Shanu N Kothari, MD FASMBS
Co-Authors: Brandon Grover, DO; Andrew J. Borgert, PhD; Matthew T Baker, MD; Kara J. Kallies, MS
- 3:10pm** **A110-Long-Term Mortality Risk Following Roux-en-Y Gastric Bypass (RYGB): A Case-Control Study**
Main Presenter: Craig Wood, MS
Co-Authors: Glenn S Gerhard, MD; Tooraj Mirshahi, PhD; Jon Gabrielsen, MD; David D Rolston, MD FACP; Michelle R Lent, PhD; Peter N Benotti, MD; Christopher D Still, DO FACN FACP; William E Strodel, MD; Anthony T Petrick, MD FASMBS

- 4:15pm** **A111-Long-term (11+ years) outcomes in weight, patient satisfaction, comorbidities- and gastro-esophageal reflux treatment after Laparoscopic Sleeve Gastrectomy**
Main Presenter: Jacques M Himpens, MD
Co-Authors: Gustavo Arman, MD
- 4:26pm** **A112-Laparoscopic Sleeve Gastrectomy: Results at 10 years**
Main Presenter: Carlos Zerrweck, MD
Co-Authors: Daniel Urbina, MD; Cittim B Palomares, Master in Educational Research; José G Rodríguez, MD; José L Rodríguez, MD; MBA; Elmo R Arámburo Inzunza, MD; Rafael Vizcarra, MD
- 4:37pm** **A113-The Vertical Sleeve Gastrectomy is Responsible for Dominant Shifts in Gut Microbiota**
Main Presenter: Cyrus Jahansouz, MD
Co-Authors: Christopher Staley, PhD; Michael Sadowsky, PhD; Alexander Khoruts, MD; Daniel B Leslie, MD; Sayeed Ikramuddin, MD MHA
- 4:48pm** **A114-Impact of sleeve gastrectomy on intestinal permeability in diet-induced obese mice**
Main Presenter: Claire Blanchard, MD
Co-Authors: Dulce Momblan; Antonio Lacy, MD PhD; Ricard R Corcelles, MD PhD; Josep Vidal, MD; Andrés Navarrete, MD MSc; Ainitze Ibarzabal, MD; Gabriel Díaz del Gobbo, MD
- 4:59pm** **A115-Sleeve Gastrectomy in the Elderly: A case-control study**
Main Presenter: Ricard R Corcelles, MD PhD
Co-Authors: Dulce Momblan; Antonio Lacy, MD PhD; Josep Vidal, MD; Andrés Navarrete, MD MSc; Ainitze Ibarzabal, MD; Gabriel Díaz del Gobbo, MD
- 5:10pm** **A116-THE ROUX EN Y FISTULOJEJUNOSTOMY AS AN ULTIMATE TREATMENT OF POST SLEEVE GASTRECTOMY FISTULASMid Tern Results**
Main Presenter: ELIE CHOUILLARD, MD PhD
- 5:21pm** **A117-High Acuity Sleeve Gastrectomy Patients in a Free Standing Ambulatory Surgical Center**
Main Presenter: Josiah P Billing, BS
Co-Authors: Peter S Billing, MD; Kurt Stewart, MD FACS; Steve Lickar, RN CASC; Eric Harris, MD; Robert Landerholm, MD; Jedediah Kaufman, MD
- 5:32pm** **A118-Laparoscopic Conversion to Sleeve Gasterectomy for Failed Gastric Bypass: Report Of 50 Cases.**
Main Presenter: Nawaf Alkhalifah, MD
Co-Author: Wei-Jei Lee, PhD

Thursday, November 3, 2016

Paper Session IV: Complications:Preventions & Treatments

8:00am–9:45am

- 8:00am** **A119-Discordance between surgeon self-reported and actual venous thromboembolism chemoprophylaxis is associated with increased venous thromboembolic events**
Main Presenter: Arthur M Carlin, MD
Co-Authors: Haley Stevens, MPH; Amanda Stricklen, RN MS; Rachel Ross, RN MS; Alirio deMeireles, BA; Amir A Ghaferi, MD MS; Jonathan F Finks, MD; Ruth Cassidy, MS; Anne Cain-Nielsen, MS; Oliver A Varban, MD
- 8:11am** **A120-Superior Mesenteric Arterial Catheter Directed TPA for Treatment of Portal Vein Thrombosis and Superior Mesenteric Vein Thrombosis after Weight loss surgery**
Main Presenter: Hinali M Zaveri, MD
Co-Authors: Austin Cottam, HS; AMIT K SURVE, MD; Daniel R Cottam, MD; Legrand Belnap, MD
- 8:22am** **A121-Post-Operative Home Nursing Program Decreases Bariatric Hospital Revisits**
Main Presenter: Linden A Karas, MD
Co-Authors: Steve Slane, PhD; E. Adam Goldenberg, MD; Priya Chhikara, MD; Prashanth R Ramachandra, MD
- 8:33am** **A122-Readmission rates after bariatric surgery in Sweden – a population based study.**
Main Presenter: Richard Marsk, MD PhD
Co-Authors: Erik Naslund, MD; PhD; Ingmar Naslund, MD PhD; Johan Ottosson, MD PhD; Eva Szabo, MD
- 8:44am** **A123-Buttressing of the EEA stapler during gastrojejunal anastomosis decreases complications for laparoscopic gastric bypass**
Main Presenter: John M Morton, MD MPH FACS FASMBS
Co-Authors: Homero Rivas, MD; Zach Ichter, DO; Ovet Esparza, PA; Dan Azagury, MD; Lindsey Voller, BA;
- 8:55am** **A124-Surgical management of gastroparesis: A single institution experience**
Main Presenter: Kotaro Wakamatsu, MD
Co-Authors: Federico Perez Quirante, MD; Lisandro Montorfano, Medical Doctor (MD); David Nguyen, MD; Samuel Szomstein, MD FASMBS; Emanuele Lo Menzo, MD PhD; Morris Sasson, MD; Raul J Rosenthal, MD FASMBS
- 9:06am** **A125 Readmissions Affect Reimbursement in Bariatric Surgery, But What is Under Provider Control?**
Main Presenter: Shannon Brindle, MD
Co-Authors: Anthony T Petrick, MD FASMBS

- 1:30pm** **A126-Comparative Outcomes of Totally Robotic Roux-en-Y Gastric Bypass (TR-RYGB) Between Individuals with Super-Super vs. Morbid Obesity**
Main Presenter: Sharon A Krzyzanowski, RN CBN
Co-Authors: Keith C Kim, MD FACS; Dennis Smith, MD; Cynthia K Buffington, PhD
- 1:41pm** **A127-YEAR 2 OUTCOMES IN A RANDOMIZED SHAM CONTROLLED TRIAL REPORTING WEIGHT LOSS AND SAFETY OF TARGETED USE OF ENDOSCOPIC SUTURE ANCHORS FOR PRIMARY OBESITY: THE ESSENTIAL STUDY**
Main Presenter: Thomas E Lavin, MD
Co-Author: Christopher C Thompson, MD; Wendell K Clarkston, MD; George Woodman, MD; Jaime Ponce, MD; Marc Antonetti, MD; J. Christopher J Eagon, MD; Shelby A Sullivan, MD; Dan Mullady, MD; Sreeni S Jonnalagadda, MD; Rajiv Chhabra, MD; G. Brent Sorensen, MD; Daniel B Leslie, MD; Sayeed Ikramuddin, MD MHA; Marvin Ryou, MD; Michael Ujiki, MD; Nestor de la Cruz-Muñoz, MD; Steven A Edmundowicz, MD FASGE; James Swain, MD; Jason Reynoso, MD FACS FASMBS
- 1:52pm** **A128-Comparative Effectiveness of Sleeve Gastrectomy and Gastric Bypass in the Elderly Population**
Main Presenter: Adam Celio, MD
Co-Authors: Jason Brinkley, PhD; R. Lane L Guyton, MD; Leslie Hopper, BS; Walter J Pories, MD; Konstantinos Spaniolas, MD; Kevin R Kasten, MD
- 2:03pm** **A129-Sleeve gastrectomy is safer than gastric bypass for patients with chronic renal failure**
Main Presenter: Daniel Bacal, MD FACS FASMBS
Co-Authors: Arthur M Carlin, MD; Amir A Ghaferi, MD MS; Oliver A Varban, MD; Jonathan Finks, MD
- 2:15pm** **A130 Long-term Efficacy of Laparoscopic Sleeve Gastrectomy versus Roux-en-Y Gastric Bypass: Which One Dominates? A Meta-analysis of Comparative Studies**
Main Presenter: Saeed Shoar, MD
Co-Authors: Rashin Gholamrezaee, MD; Alan A Saber, MD

- 3:45pm** **A131-Long-term results after One anastomosis-gastric bypass for super-super obesity (BMI \geq 60 kg/m²)**
Main Presenter: Jean-Marc Chevallier, MD
Co-Authors: Matthieu BRUZZI, MD; Richard DOUARD, MD PhD; Anne BERGER, MD PhD
- 3:55pm** **A132-The Texas Experience of Stomach Intestinal Pylorus Sparing Surgery (SIPS) at one year**
Main Presenter: Bo Neichoy, MD
Co-Authors: Austin Cottam, HS; Hinali M Zaveri, MD; AMIT K SURVE, MD; Daniel R Cottam, MD; Bleu Schniederjan, MD FACS FASMBS
- 4:06pm** **A133-Prospective non-randomized comparison between Single-Anastomosis Duodeno-Ileal bypass with Sleeve gastrectomy (SADI-S) and Gastric Bypass, for the treatment of morbid obesity.**
Main Presenter: Andrés Sánchez-Pernaute, Md PhD
Co-Authors: Pilar Matia, MD PhD; Elia Pérez Aguirre, MD PhD; Antonio J Torres, MD PhD; Inmaculada Domínguez Serrano, MD PhD; Emmy Arrue del Cid, MD; Pablo Talavera Eguizábal, MD; Miguel Ángel Rubio Herrera, MD PhD
- 4:17pm** **A134-Diabetes resolution and control in overweight and not morbidly obese patients undergoing biliopancreatic diversion.**
Main Presenter: Gianfranco Adami, MD
Co-Author: Nicola Scopinaro, MD
- 4:28pm** **A135-Malabsorptive bariatric surgery in superobese patients: a very long-term follow-up study** Main Presenter: Frasco S Papadia, MD
Co-Authors: Giovanni Camerini, MD; Nicola Scopinaro, MD; Massimiliano Valletti, Medical Student; Alice Rubartelli, MD
- 4:39pm** **A136-The impact of bariatric surgery in the epigenetics of patients with obesity and type 2 diabetes mellitus: A prospective study of the DNA methylation remodeling in adipose tissue**
Main Presenter: Carlos Zerrweck, MD
Co-Authors: Ernesto Sánchez, bachelor's degree; Hernán G Maydón, MD; Elisa Sepúlveda, MD; Paulina Baca, nutrition; Federico Centeno, PhD; Francisco Barajas-Olmos, Br Chem; Angélica Martínez, PhD; Guillermo Martínez, MD MPh; Lorena Orozco, MD

Friday, November 4, 2016

Paper Session VII: Balloons & Other Clinical Considerations

8:00am -10:15am

- 8:00am** **A138-THE FIRST PROCEDURELESS GASTRIC BALLOON FOR WEIGHT LOSS: FINAL RESULTS FROM A MULTI-CENTER, PROSPECTIVE STUDY EVALUATING SAFETY, EFFICACY, PARTICIPANT PREFERENCE, AND LONG TERM FOLLOW-UP**
Main Presenter: Ioannis Raftopoulos, MD PhD
Co-Authors: Martina Bojkova, MD; Tomas Kupka, MD; Marek Buzga, MSc PhD; Evzen Machytka, MD PhD; Shantanu Gaur, MD; Samuel Levy, MD; Ram Chuttani, MD; Kathryn Stecco, MD MA; Kandiliotis Ioannis, MD; Andreas Giannakou, MD
- 8:11am** **A139-Intragastric Balloon: Initial Experience with 160 Patients at a Multicenter Bariatric Practice**
Main Presenter: Shawn Garber, MD
Co-Authors: Spencer Holover; Eric Sommer; John Angstadt, MD; Wen-Ting J Chiao, MD; Nikhilesh Sekhar, MD FACS
- 8:22am** **A140-A 6-month Swallowable Balloon System results in sustainable weight loss at 1 year: results from a prospective, randomized sham-controlled trial**
Main Presenter: Aurora D Pryor, MD FASMBS
Co-Authors: Michael Larsen, MD; John C Fang, MD; Nabil Tariq, MD; Wayne J English, MD; Jaime Ponce, MD; George Woodman, MD; George M Eid, MD; Shelby A Sullivan, MD; Sreenivasa S Jonnalagadda, MD; mark d noar, MD MPH; Vafa Shayani, MD; Steven Edmundowicz, MD; Tarek Hassanein, MD; Dennis S Riff, MD; James Swain, MD
- 8:33am** **A141-Early Experience with Intragastric Dual Balloon as Treatment for Obesity**
Main Presenter: John M Morton, MD MPH FACS FASMBS
Co-Authors: Ponce, MD; Trace Curry, MD; Ninh T Nguyen, MD
- 8:44am** **A142-The effect of close postoperative follow-up on comorbidity improvement after bariatric surgery**
Main Presenter: Andrea Schwoerer, MD
Co-Authors: Adam Celio, MD; Walter J Pories, MD; Konstantinos Spaniolas, MD; Kevin R Kasten, MD
- 8:55am** **A143-Outcomes of Bariatric Surgery in Patients on Chronic Anti-coagulation Medication**
Main Presenter: Gautam Sharma, MD
Co-Authors: Phillip Schauer, MD; Ali Aminian, MD; Zubaidah Nor Hanipah, MD; emre bucak, MD; Suriya Puchai, MD; Mohammad Alsulaimy, MD; Mena Boules, MD; Stacy A Brethauer, MD
- 9:06am** **A144-Are there Gender Disparities in Cardiac Outcomes Following Bariatric Surgery?**
Main Presenter: Prashasti Agrawal, BA
Co-Authors: Homero Rivas, MD; Sharon Wulfovich, BA; Rachel Dwinal, BA; Lindsey Voller, BA; John M Morton, MD MPH FACS FASMBS

- 9:17am** **A145-The Benefits of Bariatric Surgery Prior to Elective Total Joint Arthroplasty: Is There a Role for Weight Loss Optimization?**
Main Presenter: Emanuel E. Nearing, MD
Co-Authors: Mark S. Topolski, MD; Shanu N Kothari, MD FASMBS; Kara J. Kallies, MS; Andrew J. Borgert, PhD; Tyler M. Santos, BS
- 9:28am** **A146-Evaluating Organizational Factors Associated with Postoperative Bariatric Surgery Readmissions: Do Emergency Department Characteristics, Complication Rates, and Compliance with Best Practices Affect Readmission Rates?**
Main Presenter: Ryan Macht, MD
Co-Authors: Ruth Cassidy, MS; Amir A Ghaferi, MD MS; Lewis Kazis, ScD; Howard Cabral, PhD
- 9:39am** **A147-Insurance-mandated pre-operative diet and outcomes following bariatric surgery**
Main Presenter: Charles J Keith, MD
Co-Authors: Lauren E Goss, MSPH; Jayleen Grams, MD PhD; Camille D Blackledge, MD; Richard D Stahl, MD
- 9:50am** **A148-Association of the FTO gene with suboptimal weight loss following bariatric surgery**
Main Presenter: Richard Lee, PhD
Co-Authors: Olivia Cox, BS; Timothy H Moran, PhD; Thomas H Magnuson, MD; Kimberley E Steele, MD PhD FACS; Michael Schweitzer, MD; Fayaz Seifuddin, MS

Video Sessions
Thursday, November 3, 2016

Video Session A

8:00am-9:45am

- 8:05am** **A149-Laparoscopic Transhiatal Esophagectomy after Biliopancreatic Diversion with Duodenal Switch**
Main Presenter: Deepali H Jain, MD
Co-Authors: Jill Onesti, MD; Tedi Vlahu, MD; Paul R Kemmeter, MD
- 8:15am** **A150-Laparoscopic Whipple in Roux en Y Gastric bypass anatomy**
Main Presenter: Subhash Reddy, MD
Co-Authors: Pearl Ma, MD; Subhash Reddy, MD; Kelvin Higa, MD; Keith B Boone, MD FACS FASMBS
- 8:25am** **A151 LAPAROSCOPIC ROUX-EN-Y FISTULO-JEJUNOSTOMY FOR TREATMENT OF A PERSISTENT LEAK FOLLOWING SLEEVE GASTRECTOMY**
Main Presenter: Muhammad A Jawad, MD
Co-Authors: Rena Moon, MD; Ashley Frommelt, MD; Andre Teixeira, MD
- 8:35am** **A152-Laparoscopic repair of a recurrent GastroGastric fistula after failed Transgastric closure of fistula.**
Main Presenter: Rana Pullatt, MD
Co-Authors: Amanda Peterson, RDN LD; Chelsea Connor, MD; Nina M Crowley, PhD RDN LD; T Karl T Byrne, MD
- 8:45am** **A153-Gastric bypass conversion to Duodenal Switch**
Main Presenter: A. Daniel Guerron, MD
Co-Authors: Shaina Eckhouse, MD; Nova Szoka, MD; Keri Seymour, DO; Chan W Park, MD; Jin Yoo, MD; Ranjan Sudan, MD; Dana D Portenier, MD
- 8:55am** **A154-Laparoscopic Roux-en-Y gastric bypass (LRYGB) after Loop gastric bypass and gastro-gastric fistula and reversed jejunoileal bypass**
Main Presenter: Raul J Rosenthal, MD FASMBS
Co-Authors: Rajmohan Rammohan, MD; Lisandro Montorfano, Medical Doctor (MD); Nisha Dhanabalsamy, MD; Emanuele Lo Menzo, MD; Aaron Lee, DO; Samuel Szomstein, MD FASMBS
- 9:05am** **A155-A Novel Approach To Reflux After Bariatric Surgery**
Main Presenter: Amir Aryaie, MD
Co-Author: Leena Khaitan, MD MPH
- 9:15am** **A156-Omega Loop Duodenal Switch with Linear Stapled Duodenoileostomy**
Main Presenter: Peter C Ng, MD
Co-Authors: Dustin M Bermudez, MD; Lindsey S Sharp, MD
- 9:25am** **A157-INTRA-THORACIC MIGRATION OF SLEEVE GASTRECTOMY**
Main Presenter: Ali Mouzannar, MD
Co-Authors: Abdullah Al-Hadad, FACS; Aqeel Ashraf, MD; Ibtisam Al-Bader, FRCSC; Mousa Khoursheed, MD; Abe Fingerhut, MD

Video Session B

3:45pm–5:15pm

- 3:50pm** **A158-Laparoscopic Stomach Intestinal Pylorus Sparing Surgery in Patient with Morbid Obesity and Situs Inversus; First Video Case Report**
Main Presenter: Amit K Surve, MD
Co-Authors: Austin Cottam, HS; Hinali M Zaveri, MD; Christina Richards, MD; Walter Medlin, MD; Daniel R Cottam, MD; Legrand Belnap, MD
- 4:00pm** **A159-Laparoscopic Heller Myotomy After Previous Roux-en-Y Gastric Bypass**
Main Presenter - T. Javier Birriel, MD
Co-Authors: Maher El Chaar, MD FACS; Leonardo Claros, MD FACS FASMBS
- 4:10pm** **A160-Simultaneous Gastric and Colonic Band Erosion Presenting as Lower Gastrointestinal Bleeding and Abdominal Pain**
Main Presenter - Shadi Al-bahri, MD
Co-Authors: Christopher Tufts, Medical Student; John Paul Gonzalvo, DO; Michel M Murr, MD
- 4:20pm** **A161-Intragastric Balloon as a Rescue Procedure in Patients with Super-super Obesity**
Main Presenter: Fatemah AlMarri, MBChB
Co-Authors: Jonathon D Vaz; Salman K Alsabah, MD MBA FRCSC FACS; Ahmad Almulla, MD FACS;
- 4:30pm** **A162-Reversal of Retrogastric Gastrojejunostomy with Gastrogastric fistula**
Main Presenter: Pearl Ma, MD
Co-Author: Subhash Reddy, MD; Daniel Swartz, MD; Kelvin Higa, MD; Keith B Boone, MD FACS FASMBS
- 4:40pm** **A163-Laparoscopic esophagojejunostomy for RYGB after leak from Sleeve Gastrectomy**
Main Presenter: Rajmohan Rammohan, MD
Co-Authors: Mandip Joshi, MD; Lisandro Montorfano, MD; Nisha Dhanabalsamy, MD; Emanuele Lo Menzo, MD; Samuel Szomstein, MD FASMBS; Raul J Rosenthal, MD FASMBS
- 4:50pm** **A164-Laparoscopic conversion of herniated Sleeve Gastrectomy to RYGB**
Main Presenter: Raul J Rosenthal, MD FASMBS
Co-Authors: Rajmohan Rammohan, MD; Mandip Joshi, MD; Lisandro Montorfano, Medical Doctor (MD); Nisha Dhanabalsamy, MD; Emanuele Lo Menzo, MD; Samuel Szomstein, MD FASMBS
- 5:00pm** **A165-CONVERSION OF HORIZONTAL GASTROPLASTY TO ROUX-EN-Y GASTRIC BYPASS FOLLOWED BY ESOPHAGOJEJUNOSTOMY FOR OBSTRUCTION**
Main Presenter: Muhammad A Jawad, MD
Co-Authors: Chistopher DuCoin, MD MPH; Rena Moon, MD; Andre Teixeira, MD
- 5:10pm** **A166-Laparoscopic Partial Gastrectomy with Esophagojejunostomy Reconstruction for Sleeve Gastrectomy with Stricture**
Main Presenter: Raul J Rosenthal, MD FASMBS
Co-Authors: Rajmohan Rammohan, MD; Armando Rosales, MD; Mandip Joshi, MD; Emanuele LoMenzo, MD PhD FACS; Samuel Szomstein, MD FASMBS

**Integrated Health Abstract Session
Wednesday, November 2, 2016**

Integrated Health Abstract Session

10:15am-12:00pm

- 10:20am** **A167-Prescribed Opioid and Non-Opioid Analgesic Medication Use Before and After Bariatric Surgery: 7 Year Follow-up**
Main Presenter: Wendy C. King, PhD
Co-Authors: David R Flum, MD; Marcelo W Hinojosa, MD FACS; Jia-Yuh Chen, MS; Melissa Kalarchian, MS PhD; Anita P Courcoulas, MD MPH; Bruce M Wolfe, MD FASMBS; Gregory F Dakin, MD; Kristine J Steffen, PharmD PhD; James E Mitchell, MD; Walter J Pories, MD; Konstantinos Spaniolas, MD; Susan Z Yanovski, MD; Steven H Belle, PhD
- 10:35am** **A173-A Prospective, Longitudinal Examination of Suicidal Ideation among Bariatric Surgery Patients**
Main Presenter: Wendy C. King, PhD
Co-Authors: Dave R Flum, MD MPH; Marcelo W Hinojosa, MD FACS; Gretchen E. White, MPH; Anita P Courcoulas, MD MPH; Bruce M Wolfe, MD FASMBS; Faith Ebel, MPH RD MS; Alfons Pomp, MD; Scott G Engel, PhD; Kathryn Gordon; James E Mitchell, MD; Walter J Pories, MD; Konstantinos Spaniolas, MD; Susan Z Yanovski, MD; Steven H Belle, PhD
- 10:50am** **A168-Bariatric surgery in patients with bipolar disorders: Selection factors and long-term surgical outcomes**
Main Presenter: Megan A McVay, PhD
Co-Authors: Kelli Friedman, PhD; Katherine Applegate, PhD; Dana D Portenier, MD
- 11:05am** **A169-Pathways to Address Early Weight Regain**
Main Presenter: Ciara Lopez, RN
Co-Authors: Sharon Krzyzanowski, BSN; Keith Kim, MD; Michelle Young, PAC; Cynthia K Buffington, PhD
- 11:20am** **A170-Outcomes after laparoscopic conversion of failed adjustable gastric banding to vertical sleeve gastrectomy (VSG) or Modified Duodenal Switch(MDS) with single anastomosis**
Main Presenter: SARAH SABRUDIN, MD
Co-Authors: Sarah Pearlstein, MD; Mitchell S Roslin, MD FACS; Debbie Lamoureux, PA; Andrew Brownlee, MD
- 11:35am** **A171-Long-term comparison of nutritional deficiencies after duodenal switch versus gastric bypass in the super-obese (BMI \geq 50 kg/m²)**
Main Presenter: Mustafa Hussain, MD
Co-Authors: John C Alverdy, MD; Marc A Ward, MD; Vivek N Prachand, MD
- 11:50am** **A172-The Perceived Value of Bariatric Nurse Certification**
Main Presenter: William F Gourash, MSN CRNP
Co-Authors: Jamie J Carr, BSN RN CBN; Trudy L Ivins, MSN RN CBN; Nicole Forryan, BSN RN CBN CBN; Abraham Apfel, BA PhD Candidate; Narelle Story, RN CBN PhD candidate; Jessie M Moore, APRN

**Master Course in Behavioral Health Abstract Sessions
Monday, October 31, 2016**

Masters of Behavioral Health Session I

1:30pm-5:30pm

- 3:00pm** **A174-Changes in psychotropic medications after Roux-en-Y gastric bypass or sleeve gastrectomy**
Main Presenter: Shawn Katterman
Co-Authors: Jon L Schram, MD; Shawn Katterman; Minji Sohn, PhD; Mia Miles, PharmD; Margaret de Voest, PharmD

Tuesday, November 2, 2016

Masters of Behavioral Health Session II

8:00am-12:00pm

- 11:00am** **A177-Using the Pre-Surgical Psychological Evaluation to Predict Suboptimal Weight Loss Outcomes 5-Years Following a Roux-en-Y Gastric Bypass**
Main Presenter: Ryan J Marek, MA
Co-Authors: Yossef S. Ben-Porath, PhD; Manfred van Dulmen, PhD; Megan Lavery, PsyD; Kathleen R Ashton, PhD ABPP; Leslie J Heinberg, PhD
- 11:20am** **A178-Psychological predictors of adherence to dietary recommendations after Roux-en-Y Gastric Bypass**
Main Presenter: Irmelin Bergh, MSc
Co-Authors: Ingela Kvale, PhD; Tom Mala, MD PhD
- 11:30am** **A179-Pre-Surgical Depressive Symptom Clusters and Short-Term Post-Surgical Weight Loss Outcomes among Bariatric Surgery Patients**
Main Presenter: Misty Hawkins, PhD
Co-Authors: Gail Williams, MS; Jennifer Duncan, PsyD; Christina Rummell, PhD

Masters of Behavioral Health Session III

1:30pm-5:30pm

- 2:30pm** **A178-Body Image and Anthropometric Outcomes Three Months After Bariatric Surgery**
Main Presenter: Julie A. Varns, PhD RN
Co-Authors: J. Chris C. Eagon, MD; Anne Fish, PhD RN FAHA
- 2:50pm** **A179-Group binge eating treatment reduces mood symptoms in addition to binge eating behaviors and attitudes**
Main Presenter: Rheanna Ata, PhD
Co-Authors: Megan Lavery, PsyD; Kathleen R Ashton, PhD ABPP; Leslie J Heinberg, PhD
- 4:00pm** **A175 – Efficacy of a Peer Coaching Model in Improving Bariatric Surgery Outcomes**
Main Presenter: Lindsey Voller, BA
Co-Authors: Dana Schroeder; Kaci Dudley, MD MPH; Wes Turner, BS; Rachel Dwinal, BA; John M Morton, MD MPH FACS FASMBS
- 4:20pm** **A176 – Family support for changing eating habits three years after bariatric surgery**
Main Presenter: Ingela Lundin L Kvale, PhD
Co-Authors: Tom Mala, MD PhD; Irmelin Bergh, MSc

Friday, November 4, 2016

3:45pm-5:15pm

- 3:50pm** **A183-A Novel Approach to Glycemic Control in Type 2 Diabetes Mellitus, Partial Jejunal Diversion**
Main Presenter: Martin Fried, MD, PhD
Co-Authors: Karin Dolezalova, MD; Elliott J. Fegelman, MD; Robin F. Scamuffa; Michael Schwiers, MS; Jason Waggoner, PhD; Randy J. Seeley, PhD
- 4:00pm** **A184-Novel device to detect enterotomies in real time during laparoscopy - First in human trial during Roux-en-Y gastric bypass.**
Main Presenter: Elisabeth K. Wynne, MD
Co-Author: Dan Azagury, MD
- 4:10pm** **A185-Use of a synthetic bioabsorbable tissue scaffold in the closure of the retro-Roux and meso-mesenteric internal hernia spaces during Roux-en-Y divided gastric bypasses leads to a significant reduction of subsequent internal hernia repairs**
Main Presenter: John D. Scott, MD FASMBS
Co-Authors: Joseph Ewing, MS; Roozbeh Mansour, MD; Wes W. Love, MD; Sean McDermott, GED; Allyson Hale, BA;
- 4:20pm** **A186-Endoscopic sleeve gastropasty with a follow-up time of two years**
Main Presenter: Gontrand Lopez-Nava, MD
Co-Authors: Manoel Galvão, MD; Inmaculada Bautista-Castaño, MD; Juan Pedro Fernandez-Corbelle, MD; Co-Author - Marta Trelle; Nuria Lopez, Licensed;

**Posters of Distinction Oral Presentations
Located In Poster Theater/ExhibitHall**

Not for CME

Wednesday, November 2, 2016

12:15pm-1:15pm

A5000 - THE IMPACT OF BARIATRIC ERAS PROTOCOL ON PATIENT OUTCOMES

Main Presenter: Charmaine Gentles ANP-BC RNFA

Co-Authors: Xin Zhong, MD; Larry Gellman, MD; Dominick Gadaleta, MD

A5001- Bile Reflux Gastritis of the Remnant Stomach Following Roux-en-Y Gastric Bypass: a newly recognized etiology of chronic abdominal pain successfully treated with Remnant Gastrectomy

Main Presenter: Erika La Vella, MD

Co-Author: Don Yarbrough, MD

A5002 - Trends in prevalence of severe obesity and bariatric surgery access: A state level analysis from 2011-2014

Main Presenter: Luke Funk, MD

Co-Authors: Dana Henkel, MD; Jon C. Gould, MD; Patrick Remington, MD, MPH; Shanu N. Kothari, MD FASMBS; Maria Mora Pinzon, MD, MS; Corrine I. Voils, PhD;

A5003 - Psychosocial Predictors of Weight Loss and Quality of Life Two Years After Bariatric Surgery: Results from the Toronto Bari-PSYCH Study

Main Presenter: Sanjeev Sockalingam, MD

Co-Authors: Susan Wnuk, PhD; Stephanie E. Cassin, PhD; Vincent Santiago, BSc; Matthew Kowgier, PhD; Timothy D. Jackson, MD, MPH; Allan Okrainec, MD; Raed Hawa, MD, FRCPC, DABPN

A5004 - STOPBANG score and capillary bicarbonate levels – possible screening tool for OSA in patients with obesity undergoing bariatric surgery?

Main Presenter: Fahad Mahmood, MBBS PhD

Co-Authors: Alistair Sharples, MBChB; Bridie Cornes, Degree in Critical Care; Adriana Rotundo, MD; Nagammapudur Balaji, MS FRCS; Hamarine Murally, Dr, MBBS, FRCA, MSc; John Jerstice, MB ChB, FRCA, FFICM; Ravish Jeeji, FRCA FFICM; Vittal SR. Rao, MS, MD, FRCS

A5005 - FIRST COMPARATIVE STUDY BETWEEN SLEEVE GASTRECTOMY, LAPAROSCOPIC GREATER CURVATURE PLICATION AND ENDOSCOPIC PLICATED GASTROPLASTY

Main Presenter: Amador Garcia Ruiz, MD

Co-Authors: Eduard Espinet Coll, MD; Gontrand Lopez-Nava, PhD; Javier Nebreda Duran, MD; Manoel Galvao Neto, MD; Jordi Pujol Gebelli, MD, PhD

A5006 - Efficacy of IV Acetaminophen in Laparoscopic Roux-en-Y Gastric Bypass Surgery Patients

Main Presenter: Matt A. Lange, DO

Co-Author: Michael Kia, DO

A5007 - 12 Month Satiety Changes in a Randomized Controlled Multicenter Study of an Incisionless Operating Platform for Primary Obesity (pose procedure™) vs. Diet-Exercise Alone: The MILEPOST Study

Main Presenter: Karl Miller, MD FACS

Co-Authors: Jan Willem Greve, MD PhD; Roman Turro, MD; Jorge C Espinos, MD, PhD; Stephanie Amlung, PhD, RN

A5008 - Patient travel for bariatric surgery: Does distance matter?

Main Presenter: Matthew G. Mullen, MD

Co-Author s: J. Hunter Mehaffey, MD; Max O. Meneveau, BS; Alex D. Michaels, MD; Florence E. Turrentine, PhD RN; Bruce Schirmer, MD; John R. Pender, MD FACS; Peter T. Hallowell, MD

A5009 - Laparoscopic Adjustable Gastric Band Colonization Indicates Re-Classification of Surgical Wounds

Main Presenter: John M. Morton, MD MPH FACS

Co-Authors: Zach Ichter, DO; Lindsey Voller, BA; Ovet Esparza, PA; Sayantan Deb, BS

A5010 - Reversal of Roux-en-y gastric bypass at a tertiary center with a large experience in laparoscopic gastric bypass revision: indications and outcomes.

Main Presenter: Pearl Ma, MD

Co-Author :Subhash Reddy, MD; Aaron Lloyd, MPH; Saber Ghiassi, MD MPH; Daniel E. Swartz, MD; Keith B. Boone, MD, FACS, FASMBS; Eric J. DeMaria, MD; Kelvin Higa, MD

A5011- Intra-gastric Balloon Insertion as a prelude to definitive Bariatric Surgery in Super Obesity: A Sixteen-year Single Institution Experience

Main Presenter: Hutan Ashrafian, MBBS BSC MRCS

Co-Authors: Thomas S. Braby, BEng; Nuala Davison, B.Nurs (Hons); Kelli A. Edmiston, RD; Rukshana Ali; Denise Ratcliffe, MD; James Smellie, MD; Gianluca Bonanomi, MD FRCS; Jeremy Thompson, MD; Evangelos Efthimiou, MD MSc;

A5012 - A Retrospective Comparison of Roux-en-Y Duodenal Switch with Single Anastomosis Duodenal Switch (SIPS-Stomach Intestinal Pylorus Sparing Surgery) at a Single Institution with Two Year Follow-Up

Main Presenter – Amit K Surve, MD

Co-Authors: Hinali M. Zaveri, MD; Daniel R. Cottam, MD; Legrand Belnap, MD; Samuel Cottam, CNA; Mitchell S. Roslin, MD, FACS; Austin Cottam, HS; Christina Richards, MD; Walter Medlin, MD;

A5013 - Intestinal glucose transporters GLUT-1 and GLUT-5 expression in obese and non-obese subjects and potential impact on Type 2 diabetes remission following bariatric surgery

Main Presenter - Rebecca A. Deal, MD

Co-Authors: Yueming Tang, PhD; Reid N. Fletcher, MD; Alfonso Torquati, MD, MSCI; Philip A. Omotosho, MD;

A5014 - Heart rate patterns and prediction of postoperative complications during the first 48 hours after bariatric surgery

Main Presenter - Carlos Zerrweck, MD

Co-Authors: Miguel Alejandro Solís Vazquez, MD; Ricardo Berrones, MD; Eva Ramírez, MD; Monica Amado, MD; Lizbeth Guilbert, MD; Elisa Sepúlveda, MD; Hernán Maydón, MD

A5015 - Weight loss outcomes in patients with Stomach Intestinal Pylorus Sparing surgery at 3 years

Main Presenter - Hinali M. Zaveri, MD

Co-Authors: Amit K. Surve, MD; Daniel R. Cottam, MD; Austin Cottam, HS; Samuel Cottam, CNA; Legrand Belnap, MD; Walter Medlin, MD

A5016 - Laparoscopic Gastric Bypass is Associated with Improved Renal Function in Patients with Stage III Chronic Kidney Disease

Main Presenter - Matthew D. Spann, MD

Co-Authors: Irene D. Feurer, Ph.D.; Ronald H. Clements, MD; Seth J. Karp, MD

A5018 - Use of an Endoscopic Suturing Device for Primary Weight Loss in Class I and II Obesity: Single-Site Results of a Randomized Controlled Trial

Main Presenter - Nestor F. De La Cruz-Munoz, MD, FACS

Co-Author s: Melissa Cuesta-Gonzalez, LPN; Noel A. Emmanuelli, RDN; Meredith Young, MS, RD, LD

A5019 - MORBIDITY AND MORTALITY OF GASTRIC SLEEVE AND BYPASS PATIENTS WITH ELEVATED HBA1C LEVELS

Main Presenter: Albert Kazi, MD

Co-Authors: Keith R. Scharf, DO FACS; Marcos Michelotti, MD; Esther Wu, MD; Daniel Srikureja, MD; Renzo Garberoglio, MD; Stephanie Keeth, MSN ACNP-BC CNS CCRN, CBN; Xian Luo-Owen, PhD

A5020 - Variation in bariatric surgery episode costs in the commercially insured: Implications of bundled payments in the private sector

Main Presenter: Alexander Kelsall, BA

Co-Authors: Ruth Cassidy, MS; Arthur M. Carlin, MD; Amir A. Ghaferi, MD, MS

A5021 - Single-Anastomosis Duodeno-Ileal bypass with Sleeve gastrectomy (SADI-S). Absolute results at 5 years.

Main Presenter: Andrés Sánchez-Pernaute, MD

Co-Authors: Miguel Ángel Rubio Herrera, MD, PhD; Esteban Martín Antona, MD; Pilar Matía, MD, PhD; Elia Pérez Aguirre, MD, PhD; Antonio J. Torres, MD PhD;

A5022 - Five Years Results After ReSleeve Gastrectomy

Main Presenter: Adrian Marius Nedelcu, MD

Co-Authors: Imane Eddbali, MD; Patrick Noel, MD, FASMBS

A5023 - The utility of diagnostic laparoscopy in post-bariatric surgery patients with chronic abdominal pain of unknown etiology

Main Presenter: Mohammad Alsulaimy, MD

Co-Authors: Suriya Punchai, MD; Stacy A. Brethauer, MD; Philip R. Schauer, MD; Ali Aminian, MD

A5024 - The incidence and clinical features of hypoglycemia after bariatric surgery

Main Presenter: Zubaidah Nor Hanipah, MD

Co-Authors: Emre Bucak, MD; Suriya Punchai, MD; Gautam Sharma, MD; Bartolome Burguera, MD, PhD; Sangeeta Kashyap, MD; Stacy A. Brethauer, MD; Philip R. Schauer, MD; Ali Aminian, MD

A5025 - Baratric Surgery in Patients with Pulmonary Hypertension

Main Presenter - Michael Mulcahy, MD

Co-Authors: Zubaidah Nor Hanipah, MD; Emre Bucak, MD; Gautam Sharma, MD; Suriya Punchai, MD; Karen Steckner, MD; Philip R. Schauer, MD; Stacy A. Brethauer, MD; Raed Dweik, MD

A5026 - Duodenal-Ileal Bypass (DIPASS) for Type 2 Diabetes Mellitus: Tools and techniques for minimally invasive deployment of magnetic anastomotic rings (MAGNAMOSIS)

Main Presenter: Claire E. Graves, MD

Co-Author s: Dillon A. Kwiat, BS; Neil Ray, BS; Richard Fechter, BS; Catherine Co, MD; Rogers, MD; Michael R. Harrison, MD

A5027 - Laparoscopic Bariatric Surgery Performed on an Ambulatory Outpatient Basis

Main Presenter: Titus D. Duncan, MD

Co-Authors: Fredde Speights; Karleena R. Tuggle, MD; Shoshana Hacker, MD

A5028 - Sleeve Gastrectomy leak: endoscopic management through customized bariatric stent.

Main Presenter - Manoel Galvao Neto, MD

Co-Authors: Lyz L. Silva, MD; Luiz Gustavo de Quadros, MD; Máira Danielle Gomes de Souza, RN; Almino C. Ramos, MD; Alvaro Bandeira Ferraz, MD, PhD; JOSEMBERG Campos, PhD

A5029 - Modified Duodenal Switch (MDS) or SIPS (Stomach Intestine Pyloric Sparing) Results and Significance

Main Presenter: Sarah Sabrudine, MD

Co-Authors: Richie Goriparthi, MD; Debbie Lamoureux, PA; Daniel R. Cottam, MD; Mitchell S. Roslin, MD, FACS

A5030 - GASTRIC BAND CONVERSION TO ROUX-EN-Y GASTRIC BYPASS SHOWS GREATER WEIGHT LOSS THAN CONVERSION TO LONGITUDINAL SLEEVE GASTRECTOMY: TWO YEAR FOLLOW-UP

Main Presenter: Collin Creange, MD

Co-Authors: Matthew J. Pergamo, BS; Marina S. Kurian, MD FASMBS; George Fielding, MD; Christine J. Ren-Fielding, MD; Bradley F. Schwack, MD

A101**Decreasing Readmissions through Opportunities Provided (DROP): The First National Quality Improvement Collaborative from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP)**

John Morton *Stanford CA*¹, Stacy Brethauer *Cleveland OH*, Teresa Fraker, Jennifer Bradford *Chicago Illinois*, Kristopher Huffman, Elizabeth Berger *Maywood IL*, Anthony Petrick *Danville PA*, Cliff Ko *Stanford School of Medicine*¹

Background: Bariatric surgery has made significant improvements in morbidity and mortality over the past decade due to accreditation, fellowship training and changes in procedure practice. In 2013, the Centers for Medicare and Medicaid Services began tying reimbursement to readmissions through their Hospital Readmissions Reduction Program with one of the measures being hospital-wide readmissions including all surgical patients. While bariatric surgery has demonstrated patient safety gains, a potential area for further quality improvement are readmission rates. Several studies have demonstrated that many bariatric surgery readmissions are primarily due to preventable causes such as nausea, vomiting, electrolyte and nutritional depletion. In addition, readmissions represent a meta-outcome including patient safety, cost, and physician/patient satisfaction. In 2012, the American College of Surgeons (ACS) and the American Society for Metabolic and Bariatric Surgery (ASMBS) combined their respective national bariatric surgery accreditation programs into a single unified program for accreditation and quality improvement, the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP). Here we present the first nation-wide quality improvement MBSAQIP initiative to decrease bariatric surgery readmissions.

Methods: The Decreasing Readmissions through Opportunities Provided (DROP) program was developed after a pilot program had been successfully implemented to lower readmissions. A DROP Readmission bundle was created including: PREOP: Education Video Modules, Postop Prescriptions, Postop Surgeon Visit Made, On-Call & Clinic Phone Numbers Given; INPATIENT: Clinical Roadmap Implementation, Nutritional Consult

Completed, Discharge Checklist Completed; POSTOP: Discharge Phone Call, Postop Visit with Surgeon and Nutritionist, Referral Source Letter Sent and Monthly Readmissions Review. 128 MBSAQIP Comprehensive Centers sought and achieved local hospital leadership approval to participate in the DROP initiative. Participating DROP centers were supported by monthly webinars, two in-person meetings and an assigned mentor. Only patients undergoing primary laparoscopic adjustable gastric banding (LAGB), laparoscopic sleeve gastrectomy (LSG), or laparoscopic Roux-en-Y gastric bypass (LRYGB) from March 1, 2015 to March 31, 2016, were included in DROP. Revisional and adolescent (age<18) surgery patients were excluded. The primary outcome was 30-day readmission from date of initial operation. 2014 MBSAQIP readmission data for 128 DROP centers were employed for comparison. Secondary outcomes included <24-hour readmissions, causes of readmissions, adherence to DROP readmission bundle, complication rates, and patient satisfaction. Categorical and continuous variables were analyzed by T-test and Chi-Square as appropriate with P<.05 as significant.

Results: The 128 DROP participating hospitals were highly representative of the entire MBSAQIP hospital community with equal geographic distribution between Northeast, Mid-West, South and West; 85% Non-Profit; 50% Large Hospitals (>375 beds); 30% Teaching; 20% Rural. For the baseline year 2014, the 128 participating DROP centers had a 30-Day Readmission Rate of 4.79% with 1446 readmissions from 30204 cases. For the first two quarters combined of DROP from 3/15 - 10/15, the Readmission Rate dropped to 4.49% (882/19648) from 4.79%. The DROP first quarter readmission rate was 4.66% and for the second quarter of DROP, readmissions fell to 4.30% (p<.05). The greatest decrease in readmission occurred for hospitals with the highest quartile of 30-Day readmissions at pre-intervention. These highest quartile readmission hospitals had a baseline rate of 8.11%, which fell to 6.63% (p=0.02) in the first DROP quarter and continued to fall to 5.51% in the second DROP quarter (p<.0001). This combined readmission rate of 6.08% for the first two quarters of DROP for highest quartile of hospitals was also a significant decline (p<.0001). For readmissions <24 hours, the highest quartile hospitals had significant declines from 2.76% Pre-Intervention to 1.79% for first two DROP Quarters, p=0.001. The causes in order of

prevalence for readmission remained the same pre- and post-intervention (Nausea and Vomiting, Fluid, Electrolyte, or Nutritional Depletion, Other, Abdominal Pain, Anastomotic/Staple Line Leak, Bleeding, Intestinal Obstruction). The adherence rate to the 8 DROP processes was 6.95 First Quarter, 7.23 Second Quarter, and 6.97 1st and 2nd quarters combined.

Conclusion: In this first national MBSAQIP Quality Improvement Collaborative, it has been demonstrated that 128 hospitals can collaborate remotely through the DROP bundle, webinars, and coaching. At the mid-point of this year long project, 30-day readmissions for all DROP hospitals had fallen by 10% and for the DROP hospitals with the highest quartile for readmissions at pre-intervention, the decline in readmissions was even more pronounced with a 32% reduction. With final reporting complete by September 2016, further analysis will reveal the yearlong impact of the DROP initiative upon 30-day readmissions, complications, and patient satisfaction.

A102

Weight loss and comorbidities in revisional gastric bypass compared to a control group of primary gastric bypass. A population study from the Scandinavian Obesity Surgery Registry (SOReg).

Stephan Axer *Torsby Värmland*¹, Ingmar Näslund *Örebro Sweden*², Eva Szabo *Örebro Närke*²
Torsby Hospital¹ University Hospital Örebro²

Introduction: In Sweden the Roux-en-y gastric bypass is the most common procedure when revision of other bariatric surgery technics is needed. The procedure is considered to be favourable with satisfying results concerning weight loss and a lower complication rate. This study is an analysis of all revisional gastric bypass operations in Sweden between 2007 and 2012 compared to a matched group of primary gastric bypass with focus on indication for revisional surgery, weight results and impact on comorbidity.

Methods and material: The data was acquired from the Scandinavian Obesity Surgery Registry (SOReg), a nationwide quality and research registry covering all bariatric surgery in Sweden. The study group (rGBP) consisted of patients operated April 2007 until December 2012 with revisional gastric bypass (n=1224). A control group matched by age and sex (n=3612) was operated with a primary gastric bypass (pGBP).

Results: In the study group 675 patients (55%) were revised after VBG, 387 (35%) after AGB and 46 (12%) after fixed gastric banding. The indications for revisional surgery were miscellaneous, but the majority of the patients had weight regain or dissatisfying weight loss as solitary or contributing indication. The preoperative BMI (kg/m²) was significantly lower in the rGBP-group than in the matched control group (39.5 +- 7.6 vs. 42.5 +- 5.5, p < 0.001). After two years patients in the rGBP-group had significantly less weight loss regardless of the initial bariatric procedure (%EBMIL 59.4 +- 147.0 vs. 79.5 +- 24.7, p < 0.001). Patients in the rGBP-group operated due to weight problem had a significantly higher preoperative BMI compared with patients in the pGBP-group: 43.2 +- 5.82 vs 42.5 +- 5.5, p = 0.002. At two-years follow-up, patients in the pGBP-group had significantly higher weight loss: %EBMIL 79.5 +- 24.7 vs. 58.3 +- 26.1, p < 0.001. Preoperatively the rates of sleeping apnea, hypertension, T2DM and dyslipidemia were significantly lower in the rGBP-group: 4.4% vs. 11.0%, p < 0.001; 24.6% vs. 33.3%, p < 0.001; 11.6% vs. 18.6%, p < 0.001; 8.1% vs. 12.6%, p < 0.001. There were no significant differences in the remission rates except for hyperlipidemia, which showed a higher remission rate in the pGBP-group. Performing a subgroup analysis in the rGBP-group, patients operated due to weight problem had significantly higher rates of sleeping apnea, hypertension and T2DM in the preoperative course compared with those being revisionally operated for other indications: 5.6% vs. 2.2%, p = 0.006, 27.9% vs. 18.1%, p < 0.001, 13.2% vs. 8.5%, p = 0.014. No difference was seen for dyslipidemia (8.6% vs. 7.0%). However remission rates were not affected by the indication for revisional surgery.

Discussion: The presented study is the largest survey comparing revisional gastric bypass with primary gastric bypass in terms of weight-loss and resolution of comorbidities. In our study weight regain or inadequate weight loss was the most common indication for revisional gastric bypass operations. The weight results are in line with the overwhelming majority of studies showing inferior weight loss for revisional procedures compared with primary gastric bypass procedures regardless of the initial operation or the indication for revisional surgery. Remission rates of sleeping apnea, hypertension, T2DM and hyperlipidemia were comparable suggesting that coexisting comorbidities ought to be a strong contributing indication for revisional bariatric surgery.

A103

Post-Bariatric Surgery Hypoglycemia: Our Thirty Year Experience

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Background: The obesity epidemic is growing, with more patients undergoing bariatric surgery each year. Many short- and long-term complications have been well described following bariatric surgery, but post-bariatric surgery hypoglycemia (PBSH) has been poorly characterized due to its relative rarity. The aim of this study was to identify patients who developed PBSH and to describe its natural history.

Methods: All patients who underwent bariatric surgery at a single institution from 1985 through 2015 were identified using an IRB approved, prospectively collected database. Administrative billing data was accessed to identify a subset of these patients who were treated for hypoglycemia and a detailed chart review of each of these patients was performed to make a retrospective diagnosis of PBSH based on the presence of Whipple's triad. Patients who experienced PBSH were reviewed and their diabetes mellitus (DM) history, PBSH symptomatology, and treatment measures were assessed. Univariate analyses were performed to identify significant correlations among patient subgroups based on symptom characteristics, laboratory values, and treatments utilized.

Results: Over the 30-year study period, 3,487 patients underwent bariatric surgery at our institution, of whom 140 were treated for hypoglycemia. A total of 101 patients (2.9%) met criteria for Whipple's triad, 89 (88%) of whom had undergone Roux-en-Y gastric bypass (RYGB). These patients had a median age of 43 years and a median preoperative HbA1c of 6.2%. Of note, 74 (73%) patients who developed PBSH were not being treated for DM prior to surgery and 75 (75%) were not being treated for DM at the time of their first hypoglycemic event. The median time to first PBSH event was 56 months (range 0.27-248 months). The severity and frequency of symptoms were neither correlated with time-to-first-event nor nadir blood glucose levels. Most patients were treated with dietary modifications alone, however, 26 (26%)

patients were treated for PBSH with oral medications such as acarbose, verapamil, diazoxide, and liraglutide. Patients treated with oral medications were younger (38.6 vs 43.8 years, $p=0.02$), had earlier onset of PBSH (38.1 vs 59.6 months, $p=0.02$), had a lower associated nadir blood glucose (35 vs 43.9 mg/dL, $p=.003$), and had a lower preoperative HbA1c (6.3 vs 7.7%, $p=0.046$). One patient who had severe symptoms despite treatment with multiple oral medications underwent conversion of RYGB to sleeve gastrectomy with resolution of PBSH.

Conclusions: To our knowledge this is the largest series of PBSH to date. PBSH onset and severity are widely variable. Given the natural history of PBSH, physicians caring for bariatric surgery patients should be aware that patients with later onset of PBSH symptoms are less likely to have resolution as well as the fact that symptom severity was not associated with any of the other factors we examined. Successful management of these patients can prove difficult, and should include dietary therapy and the use of a multidisciplinary team approach including bariatric physicians and endocrinologists as indicated.

A104

Incident Substance Use and Misuse among Adults following RYGB and LAGB: 7 Year Follow-up

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Background: Prior work indicates that Roux-en-Y gastric bypass (RYGB), but not gastric banding is associated with increased risk of alcohol use disorder (AUD). In addition, pharmacokinetic studies provide

evidence that RYGB affects alcohol absorption and metabolism. However, identifying and tracking long-term incident alcohol and other substance use and misuse has not been done in people following these procedures.

Methods: The Longitudinal Assessment of Bariatric Surgery-2 is a 10-center observational study of 2458 adults who underwent bariatric surgery. Pre-surgery and annually post-surgery for up to 7 years, past year alcohol use and consequences were assessed with the Alcohol Use Disorders Identification Test (AUDIT). Participants were categorized as having symptoms of AUD if their AUDIT score was ≥ 8 or they endorsed 'symptoms of alcohol dependence' or 'alcohol-related harm.' Past year drug abuse, defined as use of cocaine, hallucinogens, inhalants, phencyclidine (PCP), amphetamines and marijuana other than as prescribed by a physician, and substance use disorder (SUD) treatment, defined as counseling or hospitalization for alcohol or drug use, were assessed with study-specific forms. This analysis includes the 1481 participants who underwent RYGB and 522 who underwent laparoscopic adjustable gastric banding (LAGB) and who had baseline and follow-up substance use data. Among participants without each substance-related outcome at baseline, time to first event was calculated from the date of surgery to the first time the outcome was reported. Using the Kaplan-Meier method, the cumulative incidence of post-surgery substance-related outcomes was determined for annual assessments, by surgical procedure. Combining the RYGB and LAGB subsamples, multivariable Cox proportional-hazard models were used to identify baseline factors related to incident post-surgery onset of AUD symptoms, drug abuse and SUD treatment.

Results: Annual follow-up ranged from 66% to 78%. Participants who underwent RYGB were 80% female and 85% white, with median body mass index (BMI) 46 kg/m²; and median age 46 years; those who underwent LAGB were 77% female, 89% white, with median BMI 44 kg/m²; and median age 48 years. The unadjusted cumulative incidence of substance-related outcomes over time is shown in

Figure 1. Year-7 cumulative incidence of AUD symptoms, drug abuse and SUD treatment were 35.4% (95%CI: 28.6-43.3), 11.9% (95%CI: 9.6-14.6) and 9.0% (95%CI: 5.4-14.8), respectively, following RYGB (Figure 1A), and 21.9% (95%CI: 11.3-39.8), 9.0% (95%CI: 4.6-17.2) and 0.9% (95%CI: 0.4-2.5), respectively, following LAGB (Figure 1B). Male sex (AHR: 1.74; 95% CI: 1.34-2.25), younger age (AHR: 1.41; 95% CI: 1.26-1.58, per 10 years), smoking (AHR: 1.45; 95% CI: 1.05-1.99), alcohol consumption (AHR: 3.00; 95% CI: 2.20-4.07, per some but not regular consumption, and AHR: 12.34; 95% CI: 8.16-18.65, per regular consumption, vs. no consumption), and lower sense of belonging (AHR: 1.06; 95% CI: 1.02-1.11, per 1 point lower on Interpersonal Support Evaluation List-12 score) at baseline were independently related to incident post-surgery AUD symptoms. Male sex, younger age, smoking, and regular alcohol consumption at baseline also increased the likelihood of post-surgery drug abuse or SUD treatment, as did 'other' race (i.e. multi-race, Native American, Asian or Pacific Islander vs. white), lower household income (<\$25,000 vs. \geq \$50,000), past-year psychiatric treatment, and lifetime history of psychiatric hospitalization. Controlling for these factors, compared to those who underwent LAGB, those who underwent RYGB had an increased likelihood of post-surgery AUD (AHR=2.07, 95%CI: 1.52-2.82) and SUD treatment (AHR=3.86, 95%CI: 1.38-10.83); the association between surgical procedure and drug abuse was not significant (AHR=1.52, 95%CI: 0.93-2.48).

Conclusion: Among adults with severe obesity who did not report AUD symptoms in the year prior to surgery, over a third who chose to undergo RYGB and one fifth who chose to undergo LAGB reported AUD symptoms at one or more annual assessments within 7 years following surgery. Compared with LAGB, undergoing RYGB was associated with increased risk of incident post-surgery AUD symptoms and SUD treatment, after accounting for known confounders. These data suggest that all patients should be informed of risk factors for post-surgery substance-related outcomes, including surgical procedure.

A105**First Report from the American Society of Metabolic and Bariatric Surgery Closed-Claims Registry: Prevalence, Causes, and Lessons Learned from Bariatric Surgery Medical Malpractice Claims**

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Background: The landmark Institute of Medicine Report *To Err is Human* highlighted the societal need to improve patient safety. Medical malpractice claims are often offered as a method of addressing lapses in patient care. Bariatric surgery has experienced a tremendous improvement in patient outcomes due in part to accreditation, fellowship training and changes in procedure practice. Despite bariatric surgery's excellent patient safety profile, malpractice coverage for bariatric surgery malpractice was initially difficult to obtain. A bariatric surgery closed claims registry affords the opportunity to review specific episodes of care that may have opportunities for improvement. Here, we present the first bariatric surgery closed claims registry designed to examine prevalence and causes of malpractice claims with examination of prospects for quality improvement.

Methods: Four of the nation's major malpractice insurers agreed to participate in the American Society for Metabolic and Bariatric Surgery's Closed Claims Registry. The ASMBS Closed Claims Taskforce obtained primary data from direct abstraction on-site of insurance company's closed-claims files. Data abstraction included the following variables: Age, Preoperative Body Mass Index, Female, Number of Comorbidities, Surgeon Board Certified, Surgeon Foreign Medical Graduate, Hospital Accreditation Status, Types of Procedures and Complications, Monetary Awards and Lawsuit Expenses. Following data abstraction, a structured clinical summary of each closed claim was provided to all ASMBS Closed Claims Expert Panel members. Members of the ASMBS Closed Claim Expert Panel provided assessment of the clinical summary on basis of the following categories: diagnosis and treatment events; surgeon preoperative, intra-operative, post-

operative, global assessment of care; complication preventable by surgeon, preoperative, intra-operative, post-operative care; role of language, informed consent, fatigue, distraction, workload clinical performance issues, equipment, or teaching hospital/trainee supervision; communication concerns; cause determination by provider, system and/or disease; and care determination.

Results: A total of 167 closed-claims were identified from index bariatric surgeries from 2006-2014. Patient, surgeon and hospital demographics were as follows: Age, 44.6 ± 1.11 years; Preoperative Body Mass Index, 49.0 ± 1.47 kg/m²; Female, 71.4%; Number of Comorbidities, 2.67 ± 0.23; Surgeon Board Certified, 75.9%; Surgeon Foreign Medical Graduate, 27.5%; Hospital Accredited, 43.3%. Types of Procedures included, %: LRYGB, 46.3; Lap Band, 12; Open Bypass, 11.1; Sleeve Gastrectomy, 8.3; Non-Standard Procedures, 4.6; Band Removal, 4.6; BPD/DS, 3.7; Band to BPD/DS, 1.9; LRYGB revision, 1.9. Clinical complications included, %: Mortality, 35.1; Leak, 17.5; Bowel Obstruction, 9.6; Surgical technical error, 6.1; Bleeding, 5.3; Retained foreign body, 5.3; Wound infection/dehiscence, 4.4; Vascular injury, 4.4; Nutrient deficiencies, 4.4; Intra-abdominal Abscess, 3.5; Prolonged Nausea/Abdominal pain, 2.6; Ulcers/Stricture, 1.8; Myocardial infarction, 0.9. Mean Monetary Awards were \$293,499.83 +/- 100,434.60 (Range \$0.00-\$10,400,000.00). Mean expenses for lawsuit were \$91,835.54 +/- 12,111.40 (Range \$0.00-\$850,000.00). The ASMBS Closed Claims Expert Panel found the following assessments of care, %: Failure to Diagnosis, 47.8; Delayed treatment, 44.6; Surgeon Care Inadequate: Preoperative, 14, Operative, 29.8, Post-Operative, 49.7; Global assessment of care not met satisfactorily, 62.2; Complication preventable by surgeon, 54.1; Improved post-operative care would have prevented complication, 42.5; Inadequate informed consent, 8.9; Concerns regarding teaching hospital/trainee supervision, 5.1; Team Communication Concerns, 61.9; Cause determination by provider (80.8), system (34.4) and/or disease (28.4); and Overall Care determination: Appropriate (24.9), Surgeon Opportunity for Improvement, 55.9; Preventable Error, 28.4, Preventable 9.

Conclusion: Prevalence of malpractice claims regarding bariatric surgery is low. Compared to

national norms, malpractice claim patients were heavier and more often male. Surgeons who were involved with malpractice claims were less often board-certified and more often foreign medical graduates than national norms. Hospitals involved with malpractice suits had a much lower accreditation rate in comparison to national norms. Malabsorptive and non-standard procedures were over-represented in malpractice claims in comparison to MBSAQIP procedure rates. While mortality was the most common cause for malpractice suits, Bleeding, Retained foreign body, and Vascular injury occurred at higher rates than national averages. Overall care determination found 37.4% of cases to be either preventable error or preventable. Failure to diagnose, Delay in Treatment, Postoperative Care and Communication domain responses from Expert Panel indicate future opportunities for improvement along with specific recommendations for prevention of retained foreign bodies and vascular injury following trocar placement.

A106

Goals vs. Expectations: What Patients and Referring Physicians should know about who achieves a BMI < 30 kg/m2 after Bariatric Surgery

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Background: Achieving a BMI under 30 kg/m2 is a key goal of bariatric surgery, given the increased risk for mortality with BMIs over this threshold. While bariatric surgery offers superior weight loss and comorbidity resolution when compared to medical management, less than half of patients will reach a BMI under 30 kg/m2 after bariatric surgery. The goal of this study was to identify predictors for patients achieving this weight loss target.

Methods: This study was conducted using data from the Michigan Bariatric Surgery Collaborative, a statewide consortium that uses a clinical data registry for quality improvement. We included patients who underwent a primary bariatric procedure between 2006 and 2015 and also completed surveys at baseline and at 1-year after

surgery (n=19764). Regression analysis was used to compare 30-day complications and 1-year comorbidity remission between patients who achieved BMI < 30 kg/m2 and those who did not, adjusting for patient characteristics and procedure type. Comorbidity remission was defined as discontinuation of treatment for the condition in patients receiving treatment on baseline surveys. Logistic regression was used to identify predictors for achieving a BMI < 30 kg/m2 at 1 year after surgery.

Results: A total of 7528 patients (38%) achieved a BMI < 30 kg/m2 1 year after surgery. The mean age for this group was 47 years and the mean preoperative BMI was 42.6 kg/m2. The most common procedures performed in this group was gastric bypass (55.2%), followed by sleeve gastrectomy (38.0%), adjustable gastric banding (5.1%) and duodenal switch (1.7%). Overall risk adjusted 30-day complication rates were similar between the two groups (8.08% for BMI < 30kg/m2 vs 7.04% for BMI >= 30kg/m2, p=0.69). Patients who achieved a BMI of less than 30 kg/m2 had significantly higher rates of medication discontinuation for hyperlipidemia (60.7% vs 43.2%, p<0.0001), diabetes (insulin: 67.7% vs 50.0%, p<0.0001; oral medications 78.5% vs 64.3%, p<0.0001), hypertension (54.7% vs 34.6%, p<0.0001) as well as a significantly higher rate of sleep apnea remission (72.5% vs 49.3%, p<0.0001) and higher satisfaction rate (92.8% vs 78.0%, p<0.0001), when compared to patients who did not. Significant predictors of achieving a BMI < 30 kg/m2 at 1 year after bariatric surgery included a preoperative BMI < 40 kg/m2 (OR 13.31, CI 11.95-14.83, p<0.0001) and private insurance (OR 1.12 CI 1.04-1.21, p=0.002). Patients who underwent gastric bypass, sleeve gastrectomy and duodenal switch also had a higher likelihood of achieving a BMI < 30 kg/m2, when compared to adjustable gastric banding (OR 19.1, 7.3 and 72.4, respectively, p<0.0001) Only 8% of patients with a BMI over 50 kg/m2 achieved a BMI of less than 30 kg/m2 after bariatric surgery. Patients who failed to achieve a BMI of 30 kg/m2 at one year after bariatric surgery had significantly higher rates of preoperative hypertension (60.6% vs 49.3%, p<0.0001), diabetes (38.8% vs 30.8%, p<0.0001), asthma (21.4% vs 18.9%, p<0.0086), mobility limitations (7.5% vs 3.0%, p<0.0001), and obstructive sleep apnea (50.5% vs 40.3%, p<0.0001).

Conclusions: Patients achieving a BMI < 30 kg/m2 1 year after bariatric surgery had a significantly higher rate of comorbidity remission and were more

satisfied. Healthier patients with private insurance and a preoperative BMI < 40kg/m² were more likely to reach the weight loss goal at 1 year. Metabolic procedures were also more successful than purely restrictive ones. Only 8% of patients achieved this goal when their preoperative BMI > 50 kg/m². Policies and practice patterns that delay bariatric surgery until the BMI is highly elevated can result in inferior outcomes, although morbidity is unchanged. Patients should be counseled appropriately with respect to expectations after bariatric surgery.

A107

Contraception and conception following Bariatric Surgery: 7 Year Follow-up

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Background: Approximately 40% of bariatric surgery patients in the U.S. are reproductive aged women; however, data regarding post-operative contraception and fertility has been largely limited to single-center case series or cohort studies.

Methods: The Longitudinal Assessment of Bariatric Surgery-2 is a 10-center observational study of adults who underwent bariatric surgery. Reproductive health was assessed among female participants (N=1931) pre-surgery and annually post-surgery for up to 7 years. This report was restricted to women 18-44 years old who reported no history of surgical or natural menopause, hysterectomy, or hormone replacement therapy. Data collected after any of these exclusion criteria were met was censored. Primary outcomes were reported as post-surgery rates of 1) unprotected intercourse (defined as not always using birth control while having intercourse with a male partner), and 2) conception. Mixed models were used to compare rates by time

point and examine associations of baseline history of primary infertility (i.e., nulliparous and prior attempts at conception including at least 12 months of regular intercourse with a male partner and not using any form of birth control) with unprotected intercourse and trying to conceive post-surgery.

Results: Of 741 women who met eligibility requirements, 711 reported a primary outcome. Baseline median (IQR) age was 37 (32-41) years. Approximately half (50.6%) did not plan to become pregnant post-surgery; future pregnancy was important to 30.3%. Eight percent had a history of primary infertility. In the year following surgery, 44.8% (95% CI, 39.8-49.9%) of women reported unprotected intercourse; whereas 39.6% (95% CI, 34.9-44.3%) always used birth control during intercourse and 12.2% (95% CI 9.2-15.2%) did not have intercourse with a male. These rates did not significantly differ between follow-up time points (p=0.42, p=0.22 and p=0.66, respectively). In the first post-operative year, 3.5% (95% CI, 2.0-5.0%) of women reported trying to conceive. This rate significantly increased to 9.7% (95% CI, 5.4-14.1%) - 12.2% (95% CI, 4.8-19.5%) in years 2-7 (p for all<0.001). Women with a history of primary infertility versus those without were more likely to report unprotected intercourse (RR=1.89 [95% CI=1.64-2.19] p<.0001) and attempting to conceive (RR=5.29 [95% CI, 3.71-7.55]; p<.0001) post-surgery. With regards to conception, 154 women had a total of 237 pregnancies, translating to a conception rate of 53.8 (95% CI, 40.0-71.1)/1,000 person-years. Among women with a history of primary infertility, the conception rate was 121.2/1,000 person-years (95%CI, 102.3-143.5). Conception rates were not significantly different among the following post-surgical intervals: 0-<18 months, 18-<42 months and 42<90 months (p>.05).

Conclusion: In this large multi-center cohort, 45% of women reported having unprotected intercourse in the first year following surgery, although the vast majority (>95%) reported that they were not attempting to conceive. History of primary infertility was associated with greater risk of unprotected intercourse and higher rates of conception. Although data regarding pre-surgical contraceptive counseling was unavailable, our results provide important guidance regarding post-surgical fertility that may aid in pre-surgical counseling regarding contraception and conception.

A108

Factors that influence length of stay following bariatric surgery

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Introduction: The safety of laparoscopic Roux-en-Y gastric bypass (LRYGB) and laparoscopic vertical sleeve gastrectomy (LVSG) have been well-documented, and the development of enhanced recovery after surgery (ERAS) protocols quickly gained traction for bariatric operations. At our institution, we implemented an ERAS protocol for primary bariatric surgery that begins to consider patient discharge as early as the first post-operative day (POD 1). The objective of this study was to identify the feasibility of early (POD 1) discharge as well as pre-operative and intra-operative predictors of length of stay beyond POD 1 following LRYGB and LVSG.

Methods: The study population consists of all patients who underwent primary LRYGB or LVSG between 2010 and 2015. Revisional and open procedures were excluded. At our institution, all primary bariatric surgery patients are managed based on our bariatric ERAS protocol, which allows patient discharge as early as POD 1. Prospectively collected data included demographic and anthropomorphic measurements, pre-operative comorbidities, intra-operative findings and events, and length of stay. Clinically significant associated factors were identified on univariate analysis. These factors were then used for multivariate analysis to identify predictors of hospital stay beyond POD 1.

Results: During the study period, 647 consecutive patients underwent LRYGB and 310 consecutive patients underwent LVSG. The mean hospital length of stay for LRYGB and LVSG was 47.2±0.5 hours and 51.7±1.8 hours, respectively. The majority of LRYGB patients (57.2%) and LVSG patients (71.3%) required hospitalization longer than one day postoperatively. For LVSG, the only patient variable associated with longer hospitalization beyond POD 1 was body mass index (BMI) greater than 50 kg/m² (6.7% vs. 17.6%, $p = 0.01$). In contrast, a number of variables were significantly associated with hospitalization beyond POD 1 for LRYGB: age (44.1 years vs. 47.0 years, $p < 0.01$), decreased functional status (4.3% vs. 12.2%, $p < 0.01$), insulin-dependent diabetes (7.2% vs. 16.8%,

$p < 0.01$), pulmonary hypertension (1.4% vs. 4.6%, $p = 0.03$), dyslipidemia (23.5% vs. 35.1%, $p < 0.01$), ischemic heart disease (0.7% vs. 3.0%, $p = 0.05$), operative time (186.9 minutes vs. 207.5 minutes, $p < 0.01$), operative blood loss (55.6 mL vs. 75.9 mL, $p < 0.01$), and performing additional procedures along with the index case (21.7% vs. 34.3%, $p < 0.01$). On multivariate analysis, insulin-dependent diabetes (OR 2.0, 95% CI: 1.1 to 3.6), decreased functional status (OR 2.0, 95% CI: 1.0 to 4.1), and additional procedures performed along with the index case (OR 1.5, 95% CI: 1.0 to 2.2) were significant predictors of hospitalization beyond POD 1 following LRYGB. Unlike LVSG, BMI was not associated with longer hospitalization after LRYGB.

Conclusion: Bariatric surgeons were very early adopters of protocol-driven care based on best practices, well before ERAS methodology became popular in other fields of general surgery. Bariatric surgery patients undergo major operations and typically have numerous medical comorbidities. Despite routine utilization of enhanced recovery protocols following primary LRYGB and LVSG, only a minority of patients could be safely discharged from the hospital the day after bariatric surgery. We have identified several patient and operative factors that correlate to extended lengths of stay. Ultimately, optimal patient management following bariatric surgery is a balance between algorithmic care based on ERAS principles and the judgment of the experienced bariatric surgeon to advocate for the safety of the patient.

A109

Long-Term (>10 year) Outcomes after Laparoscopic Roux-en-Y Gastric Bypass

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Background: Laparoscopic Roux-en-Y gastric bypass (LRYGB) has been the 'gold standard' for weight loss surgery, resulting in substantial weight loss and comorbidity remission, however, the long-term data (>5 years) is limited, and the reporting methods for LRYGB outcomes varies in the literature. Additionally, follow-up compliance within bariatric centers is poor due to insurance and access to care issues, making long-term follow-up evaluation difficult.

Methods: A retrospective review of our institution's prospective bariatric surgery registry and integrated multispecialty health system electronic medical record system was completed. Patients who underwent LRYGB from September 2001 through June 2015 were included. Data were defined according to the 2015 Standards for Outcome Reporting.

Results: Overall, 1,402 patients underwent primary LRYGB during the study period. The mean age and preoperative body mass index (BMI) was 44.5 +/- 10.3 years and 47.5 +/- 6.2 kg/m², respectively, and 81% of patients were female. Early (<30-day) complications included anastomotic leak (0.2%), venous thromboembolism (0.6%), surgical site infections (1.4%), and urinary tract infections (1.6%). The 30-day readmission rate was 3.5%. There were no 30-day mortalities. Follow-up weight data were available for >70% of patients throughout 12 years postoperative. There were 3 LRYGB reversals. The highest mean percent excess weight loss (%EWL) and lowest mean BMI were reached at 18 months postoperative at 79% and 30.1 kg/m², respectively. The %EWL at each follow-up interval and the changes in type II diabetes mellitus (T2DM), dyslipidemia, and hypertension (HTN) are reported in the Figure.

Conclusions: This is the first report of long-term (>10 year) outcomes from a single integrated health system utilizing the 2015 Standards for Outcome Reporting. LRYGB results in significant and sustained weight loss. LRYGB results in durable improvement and resolution of obesity related co-morbidities. Integrated health care systems provide an optimal environment for data collection and long-term follow-up.

A110

Long-Term Mortality Risk Following Roux-en-Y Gastric Bypass (RYGB): A Case-Control Study

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Background: Increasing Body Mass Index (BMI) is an established risk factor for all-cause mortality. This study assessed all-cause mortality risk up to 10 years

following RYGB compared to tightly matched controls with obesity seen in primary care from the Health System network. Additionally, we stratified mortality risk by patient characteristics. Given that diabetes may increase the risk of mortality in severe obesity, this study also evaluated when early increased surgical risk is overcome by reductions in mortality risk over time that likely relate to improvements in metabolic health.

Methods: Patients who underwent Roux-en-Y Gastric Bypass (RYGB) surgery were recruited from a rural comprehensive medical center from 2004-2014. RYGB patients were matched to non-surgical controls by age (+/- 1 year), BMI (within 1 kg/m²), gender, and diabetes status (yes/no). All controls had an active status in a primary care clinic within the Health System at the time of the matched patient's surgery. Death status was obtained through the electronic medical record (EMR) and the Social Security Death Index Database. Risk factors evaluated in relation to mortality included gender, age, BMI, and diabetes status. Differences in mortality between RYGB patients and controls were assessed with Kaplan-Meier curves and Cox regression.

Results: Of the 3,490 eligible RYGB patients, matched controls were identified for 2,696 RYGB patients and were included in analyses. RYGB patients and controls were the same in age (46.1 +/- 11.1 years), BMI (47.2 +/- 6.2 kg/m²) and diabetes status (30%), and were predominately female (83%) and White (97%). Median follow-up for RYGB (postoperatively) and control patients was 6.4 years (IQR=4.2-8.3). There were 94 deaths in RYGB patients and 133 deaths in controls during follow-up. Overall, Kaplan-Meier (Figure 1) curve estimates indicated that RYGB patients experienced a significant reduction in the risk of all-cause mortality compared to controls (Logrank p-value = 0.0006). Kaplan-Meier estimated mortality rates were similar in the early follow-up period and started to diverge at year 2, but first differed significantly at 39 months (RYGB: 1.3%, 95% CI=[0.9%, 1.8%], controls: 2.4%, 95% CI=[1.8%, 3.0%]). Using Cox regression, the significant reduction in the risk of all-cause mortality translated into a hazard ratio of 0.63 (95% CI=[0.49, 0.82]). When stratified by selected patient characteristics, the largest reduced mortality odds were observed within RYGB patients age 60+ years (HR=0.50, 95% CI=[0.31, 0.81], p=0.0048) and patients with diabetes (HR=0.48, 95% CI=[0.33, 0.70], p=0.0001).

Conclusion: RYGB was associated with a significant reduction in all-cause mortality risk compared to non-surgical controls. The strongest mortality risk reductions following RYGB were found in older

adults and patients with diabetes. Mortality risk reductions, likely related to improvements in long-term metabolic health, were significant beginning at 39 months postoperatively.

Paper Session III: Sleeve Gastrectomy

Wednesday November 2nd, 2016 4:15pm – 5:45pm

A111

Long-term (11+ years) outcomes in weight, patient satisfaction, comorbidities- and gastro-esophageal reflux treatment after Laparoscopic Sleeve Gastrectomy

Gustavo Arman *Dendermonde Dendermonde*,
Jacques Himpens *Vinderhout*

Background: 10 years outcomes for sleeve gastrectomy (LSG) have not yet been documented.

Objectives: retrospective analysis of 11+ years outcomes of isolated LSG: progression of weight, patient satisfaction and evolution of comorbidities and gastro-esophageal reflux disease (GERD) treatment.

Methods: chart review + personal interview in consecutive patients who underwent primary isolated LSG between November 2001 and June 2003.

Results: Of the 110 consecutive patients, complete follow-up data was available in 65 (59.1%). Mean follow-up was 11.7 +/- 0.4 years. Two patients had died of non-procedure related causes. Twenty (31.7%) patients underwent 21 re-operations related to the LSG: 14 conversions (10 to Duodenal Switch (DS), and 4 to Roux-en-Y gastric bypass (RYGB)) and 3 re-sleeve procedures for weight issues, and 2 conversions (RYGB) and 2 hiatal hernia repairs for GERD. Consequently, 16 patients were converted to another than the sleeve anatomy, while 47 (74.6%) individuals kept the simple sleeve construction. In this latter group % of excess body mass index loss (%EBMIL) at 11+ years was 62.5%, versus 81.7% ($p=0.015$) in the former group. Mean %EBMIL for the entire cohort was 67.4%. At 11+ years postoperatively, 30 patients versus 28 preoperatively required treatment for comorbidities. None of the 7 patients who preoperatively suffered from GERD were cured by the LSG procedure. Nine additional patients developed de novo GERD. Overall satisfaction rate was 8 (IQR 2) on a scale of 0-10.

Conclusion: isolated LSG provides a long-term %EBMIL of 62.5%. When conversion to another construction is deemed necessary weight loss is

significantly better. Patient satisfaction score remains good despite unfavorable GERD outcomes.

A112

Laparoscopic Sleeve Gastrectomy: Results at 10 years

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Star Médica Hospital¹ ABC Medical Center²

Background: The Laparoscopic Sleeve Gastrectomy has gained popularity over the last decade and it is considered as the most performed bariatric surgery worldwide. Short term results are known and in some series is considered a surgery with similar results when compared with the Laparoscopic Gastric Bypass (LGBP). There is a lack of studies to determinate its efficacy in the mid and long-term, especially more than 5 years after the procedure, where it is believed that weight loss and comorbidities control might be affected.

Methods: A retrospective study was conducted at a single Institution with the records from every patient submitted to LSG from January 2003 to January 2004. The primary objective was to determinate weight loss (weight, BMI and %EWL) and comorbidities outcomes (diabetes and hypertension) during the first decade, with analyses performed baseline and at 1, 3, 5 and 10 years. Secondarily, an operative and early morbidity (< 30 days) analysis was also performed. Patients submitted to revisional surgery during follow-up were analyzed independently. Diabetes and hypertension improvement was established if there was a cessation (or downgrade) of medication. Finally, characteristics and comorbidities status of patients with surgical failure after 10 years (defined as <50% of excess weight loss) were also analyzed and compared with those presenting >50% of EWL.

Results: In a 12 months period, one-hundred and three LSG were performed by the same surgeon. Incomplete charts for the first year were observed in 33 patients and were not considered for the study; the final analysis was performed in 70 patients. Female sex comprised 72.9% of cases, presenting a mean age of 43.5 ± 9.8 years. Initial weight and BMI was 135.31 ± 13.1 kg and 47.38 ± 4.3 kg/m²; T2DM and hypertension were present in 72.9% and 41.1% respectively. The complete baseline analysis can be observed in Table 1. Follow-up at 1, 3, 5 and 10 years was achieved in 70 (100%), 61 (87.1%), 57 (81.4%) and 40 (57.1%) patients. Sixteen patients were submitted to revisional surgery (all of them after 5 years of their LSG) and were analyzed independently. The mean %EWL at 1, 3, 5 and 10 years were 59.1%, 72.7%, 66.3% and 53.8% respectively. (Figure 1) T2DM improvement was observed in 88.2%, 82.3%, 70.5% and 54.9% of cases at the same time point analysis. Hypertension improvement was observed in 79.3%, 75.8%, 68.9% and 48.2% also at 1, 3, 5 and 10 years. (Table 2 and Figures 2 and 3) There was a 33.3% of diabetic patients that required antidiabetic drugs again during follow-up, and 31.1% with hypertension that also restarted medical treatment. Nine of 27 (33%) patients presented less than 50 %EWL after 10 year, and their separated analysis revealed a mean %EWL and %TWL of 42.9 ± 6.8% and 20.7 ± 5.6%, respectively. Such group had less percentage of diabetes improvement when compared with those having >50 %EWL (33.3% vs 60%, respectively), but without statistical significance.

Conclusion: LSG proved to be a safe and effective bariatric surgery with their maximal effect during the first 3 years in terms of weight loss and comorbidities control. There is a substantial reduction in comorbidities improvement after the first year. Long term weight loss is acceptable, but around one third of patients will eventually have a relapse of T2DM and hypertension.

A113

The Vertical Sleeve Gastrectomy is Responsible for Dominant Shifts in Gut Microbiota

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Background: Vertical Sleeve Gastrectomy (VSG) dramatically improves glucose homeostasis even before substantial weight loss. Mechanistic explanations may be related to anatomic or dietary changes associated with bariatric surgery. Both factors can affect the gut microbiome, which is known to have important roles in energy metabolism.

Aims: We sought to characterize shifts in the gut microbiome after the VSG in a diet-induced obese mouse model and assess transfer of gut microbiota between cohoused VSG- and sham-operated mice.

Methods: Male C57BL6 mice were placed on a high fat diet for 12 weeks and then randomized to undergo VSG or sham surgery. Mice were individually housed or cohoused such that one VSG mouse was with one weight-matched, sham-operated mouse. Fecal samples were collected prior to, 7 and 28 days following intervention. Bacterial composition was characterized using next-generation Illumina sequencing of 16S rRNA.

Results: One week following surgery, fecal samples from all mice showed expansions of Bacteroidetes, Verrucomicrobia, and Proteobacteria, and a decline in the relative abundance of Firmicutes. These changes persisted after the VSG, while all sham-operated mice communities showed a predominance of Firmicutes by post-operative day 28. Several family-level changes correlated with weight loss following intervention. Specifically, abundances of *Porphyromonadaceae* were negatively correlated with weight ($r = -0.407$, $p < 0.001$) and insulin resistance, while *Erysipelotrichaceae* (Firmicutes), *Coriobacteriaceae* (Actinobacteria) and *Bifidobacteriaceae* (Actinobacteria) were positively correlated with weight ($r = 0.333$ and 0.299 , $p = 0.002$ and 0.006 , respectively) and insulin resistance. Only cohoused, sham-operated mice showed a shift in microbial community composition at 28 days post-operation ($p < 0.001$), which differed from individually-housed, sham-operated mice.

Conclusions: Changes in the post-VSG microbial community were correlated with weight and insulin resistance and are resistant to shifts associated with re-exposure to an obesity-associated gut microbiome. Thus, our data support an important mechanistic role for the gut microbiome in maintaining glucose homeostasis following the VSG.

A114

Impact of sleeve gastrectomy on intestinal permeability in diet-induced obese mice

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Background: Bariatric surgery is the most efficient approach to reduce body weight and metabolic complications (*i.e.* diabetes, hypertension & dyslipidemia) related to morbid obesity. Altered intestinal permeability, leading to increased lipopolysaccharides (LPS) translocation, has been suggested as a mechanism for chronic inflammatory state and insulin resistance associated to morbid obesity. The aims of this study were to assess the effect of sleeve gastrectomy in obese mice on paracellular and transcellular permeabilities in jejunum and colon and the subsequent association on LPS translocation and adipose tissue inflammation. Material and

Methods: Ten weeks old C57Bl/6J males were fed for 8 weeks prior surgery with a high-fat diet (35% Kcal from fat). Mice were then randomized in three experimental groups: sham, (laparotomy), sham pair-fed and sleeve gastrectomy. Two weeks after surgery, total transit time and the fecal water content were measured. Four weeks after surgery, paracellular and transcellular permeabilities were measured *ex vivo* in Ussing chambers with 468-Da

sulfonic acid (SA) and 44kDa horse radish peroxidase (HRP), respectively. mRNA expression of key tight-junctions proteins and inflammatory cytokines were measured with real-time quantitative PCR in intestinal mucosa and inguinal adipose tissue, respectively. Finally, plasma LPS was measured and separated by reversed phase HPLC, and quantitated by MS/MS spectrometry.

Results: Forty male mice were operated after 8 weeks of high fat diet (35%). The weight at moment of surgery was 35.8 ± 3.9 grammes (g). The average duration of the procedure was 41.08 ± 7.08 minutes. The survival rate was 86% after sleeve gastrectomy. As expected, sleeve gastrectomy significantly reduced mice body weight at two (-8%, 28.5 ± 2.9g, p=0.03) and four weeks post-surgery (-5.5%, 30.7 ± 3.5g, p=0.13). Consistently, four weeks after surgery, epididymal white adipose mass was decreased in sleeve group compared to sham (-22%, p=0.08) and pair-fed control mice (-32%, p=0.01). Sleeve gastrectomy also significantly improved glucose homeostasis, as assessed by oral glucose tolerance test. The total area under the glucose response curve (AUC) was significantly reduced after sleeve (9920 ± 3350 (sham) versus 3833 ± 3747 (sleeve) (p=0.002)). Total transit time and water content in feces were similar between the 3 groups. Interestingly, sleeve gastrectomy induced a decrease of SA (-39%, p=0.01) and HRP permeabilities (-45%, p=0.03) in jejunum, with a concomitant higher mRNA expression of Jam A (+31%, p=0.02) but not occludin (+22%, p=0.09). Conversely, SA and HRP permeabilities were significantly increased in the distal colon of sleeve-operated mice (+26%, p=0.07 and +44%, p=0.03; respectively), despite no significant changes in occludin and Jam A mRNA expression. In the adipose tissue, there was a significant increase in IL1β; mRNA levels (+30%, p=0.02), with a trend for an increase of TNFα; mRNA levels (+33%, p=0.11) in sleeve compared to sham group. Finally, plasma LPS level were significantly increased in sleeve-operated compared to sham control mice (+28%, p=0.03).

Conclusions: Sleeve gastrectomy induces significant modifications of intestinal paracellular and transcellular permeability by altering the expression of proteins involved in tight junctions. These changes could favor the LPS translocation in plasma, thus promoting a low grade pro-inflammatory state in adipose tissue. These effects of sleeve gastrectomy on intestinal permeability vary with the intestinal location and remain to be assessed after a longer period following surgery.

A115

Sleeve Gastrectomy in the Elderly: A case-control study

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Introduction: Obesity rates continue to increase at pandemic levels, including the elderly population. For many years advanced age has been considered to be a relative contraindication to bariatric surgery because of increased perioperative risk and suboptimal excess weight loss. Recent reports have shown that bariatric surgery in the elderly patient is not only safe, but it is also the most efficient treatment option with durable effects resulting in remission of associated comorbidities, improvement in quality of life and longevity. The aim of this case-control study is to compare safety and effectiveness of SG in a cohort of bariatric patients who underwent SG at age ≥ 60 years with younger patients < 60 years.

Methods: After institutional review board approval, a case-control study between January 2006 and December 2012 comparing Sleeve Gastrectomy (SG) > 60 years with SG < 60 years was performed.

Results: A total of 206 patients were included in the analysis, 103 in each study group. All procedures were attempted and completed laparoscopically. The older group had a mean age of 63.3 \pm 2.8 years and an average body mass index (BMI) of 45.8 \pm 22.8 kg/m². At the time of surgery, there were no significant differences in baseline characteristics between the older (≥ 60 years) and younger (< 60 years) group with respect to gender, BMI, comorbidities and American Society of Anesthesiologists (ASA) classification. Operative time was similar (76.7 \pm 28.3 min versus 75.5 \pm 19.4 min; $p=0.7$). Median length of stay (LOS) was 2 days (range 2-60) in the older group versus 3 days (range 2-28) for the younger. No mortality was reported in any of the two groups. We analyzed the 30-day complication rate according to the Clavien-Dindo classification without significant differences between

groups. Overall early complications in the ≥ 60 years group were 9.7% versus 15.5% for the younger group, $p=0.2$. Retention rate for both groups at 36 months follow-up was 97% for the older, and 88% in the younger group (range 13-112 months). After SG, BMI was similar between the >60 years and the <60 years groups at 3 (38.7 versus 38.2 kg/m², $p=0.4$), 6 (34.1 versus 33.3 kg/m², $p=0.3$) and 12 months (30.7 versus 29.8 kg/m² $p=0.1$). Thereafter, the elderly group showed statistical difference in comparison with the younger group at 24 (33.4 v/s 31.5 kg/m² $p=0.01$) and 36 (34.6 v/s 32.8 kg/m² $p=0.01$) months favoring the <60 years group. Mean percent excess weight loss (%EWL) was similar between groups during all follow up period without statistical difference at 3 (34.3% versus 33.5%, $p=0.6$), 6 (57.5% versus 54.2%, $p=0.1$), 12 (73.5% versus 69.4%, $p=0.1$), 24 (60.9% versus 61.2%, $p=0.9$) and 36 months (55.7% versus 56.1%, $p=0.8$). With regard to mean percent total body weight loss (%TWL) change, the younger group had statistically higher %TWL at 3 (15.1% versus 17.1%, $p=0.03$), 6 (25.2% versus 27.5%, $p=0.04$), 12 (32.4% versus 35.2%, $p=0.03$), 24 (26.7% versus 32.4%, $p<0.01$) and 36 months (24.9% versus 29.1%, $p<0.01$). Finally, we also reported SG failure rate. The percentage of patients with %EWL $< 50\%$ at 36 months of follow-up was no difference between the >60 and <60 years old groups (38.8% versus 36.2% $p=0.2$). We also assessed obesity related comorbidities after SG. Both groups showed no statistical difference regarding to diabetes improvement or resolution. Nevertheless the younger patients had a trend to better resolution of diabetes (35.1% versus 51.7% $p=0.07$), while the elderly group had higher percentage of improvement (42.1% versus 31% $p=0.2$). Both groups had similar rates of hypertension resolution (31.7% versus 36.2% $p=0.5$) and improvement (30.5% versus 42.5% $p=0.1$). Instead of this results, when we analyzed the subjects without any changes in hypertension after surgery we found that the >60 group had worse results than the <60 group (37.8% versus 21.3% $p=0.02$). With reference to dyslipidemia, both cohorts had similar resolution rates (34.9% versus 33.3%, $p=0.2$). Importantly, when we evaluated Obstructive Sleep Apnea (OSA) changes after SG; the younger group showed higher rates of OSA resolution (60.8% versus 76% $p=0.02$).

Conclusion: Sleeve Gastrectomy is a safe and feasible procedure in advanced age patients (>60 years old) with comparable long-term results (weight loss and resolution of comorbidities) to the younger

population. Therefore age alone should not be an absolute contraindication for Sleeve Gastrectomy.

A116

THE ROUX EN Y FISTULOJEJUNOSTOMY AS AN ULTIMATE TREATMENT OF POST SLEEVE GASTRECTOMY FISTULAS Mid Tern Results

ELIE CHOUILLARD *POISSY YVELINES*
PARIS POISSY MEDICAL CENTER

Background: Sleeve Gastrectomy (SG) is currently the most commonly performed bariatric procedure in France. It achieves both adequate excess weight loss and significant reduction of comorbidities. However, leak is still the most common complication after sleeve gastrectomy. Its risk of occurrence is indeed less than 3.3 % in specialized centers [1]. However, its management is not standardized, long, and challenging. We have already reported the short-term results of Roux-en-Y fistulojejunostomy (RYFJ) as a salvage procedure in patients with post sleeve gastrectomy fistula [2]. In this study, we analyzed the mid-term results of the RYFJ emphasizing its endoscopic, radiologic, and safety outcome.

Methods: Between January 2007 and December 2013, we treated 75 patients with post sleeve gastrectomy fistula, mainly referred from other centers. Immediate management principles included computerized tomography (CT) scan guided drainage of collections or surgical peritoneal lavage, nutritional support, and endoscopic stenting. Ultimately, this approach achieved fistula control in nearly two thirds of the patients. In the remaining third, RYFJ was proposed, eventually leading to fistula control in all cases. The mid-term results (i.e., more than one year after surgery) were assessed using anamnesis, clinical evaluation, biology tests, upper digestive tract endoscopy, and IV-enhanced CT scan with contrast upper series.

Results: Thirty patients (22 women and 8 men) had RYFJ for post SG fistula. Mean age was 40 years (range, 22-59). Procedures were performed laparoscopically in all but 3 cases (90 %). Three patients (10 %) were lost to follow-up. Mean follow-up period was 22 months (18-90). Mean body mass index (BMI) was 27.4 kg/m²; (22-41). Endoscopic and radiologic assessment revealed no persistent fistula and no residual collections.

Conclusions: RYFJ is a safe and feasible salvage procedure for the treatment of patients with post sleeve gastrectomy fistula. Mid-term outcome analysis confirms that fistula control is durable. Weight loss panel is satisfactory. No major disturbance hindered the confirmed safety of the procedure.

A117

High Acuity Sleeve Gastrectomy Patients in a Free Standing Ambulatory Surgical Center

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Eviva¹

Background: Sleeve gastrectomy (SG) is currently the most widely performed procedure for the treatment of morbid obesity. SG leads to significant weight loss as well as a reduction in weight related comorbidities. Procedures performed in ambulatory surgical centers (ASC) can provide several advantages over hospital-based surgery. But concerns have been understandably raised regarding high acuity cases in the ASC setting. Recently the Metabolic and Bariatric Surgery Assurance Quality Improvement Program (MBSAQIP) presented protocols for ASC's to follow, requiring them to perform only 'low acuity' cases in order to be compliant with accreditation. High acuity patients are now defined as patients >65 years of age, Body Mass Index (BMI) >55 for men and >60 for women, or a prior history of bariatric surgery. We present the results of our 'high acuity' patients done in a free standing ASC.

Objective: Assess the safety and efficacy of outpatient SG on the high acuity patient in a freestanding ASC.

Setting: Free Standing ASC, Eviva Bariatrics, Seattle WA

Methods: Data was collected retrospectively for all patients who underwent SG from Jan 1st 2013 - Dec. 31st 2015, n=1,112. All cases were done in a single free standing ASC with 23 hour stay capability. Of those patients 120 were classified as 'high acuity' according to the MBSAQIP guidelines. Our series included 33 patients >65 years old, 8 male patients with a BMI >55, 3 female patients with a BMI >60, 4 Nissen to sleeve procedures, and 72 patients with a history of previous bariatric surgery (revisional). Patients were excluded from the ASC if they weighed

>450 pounds, if anticipated surgery time was > 2 hours, if the patient had impaired mobility limiting early ambulation, or if there were medical problems requiring postoperative monitoring beyond 23 hours. All patients were enrolled in a comprehensive aftercare program.

Results: Mean age was 51.7 years (range 24-73), mean preoperative body mass index (BMI) was 42.4 (26.2-65.9). Mean operative time was 91 minutes. Four patients (3.33%) were readmitted within 30 days. Causes of re-admission were portal vein thrombosis (2 patients), intra-abdominal abscess (one patient), and post-operative bleeding (one patient). One patient (0.83%) was transferred from the ASC to a nearby hospital due to a post-operative bleed. One patient (0.83%) had a re-operation to evacuate a hematoma. There were zero staple line leaks. There were no open conversions and no deaths within 30 days or at one year. High Acuity SG patients lost on average 43.6% at six months of their excess body weight (EWL) and 54.9% EWL at 12 months. Sixty four of the 120 patients (53.3%) were band to sleeve conversions, 7 re-sleeves (5.8%), 4 Nissen fundoplication to sleeves (3.3%), 1 gastric bypass to sleeve (0.8%), and 44 (36.7%) patients that were high acuity according to the MBSAQIP.

Conclusion: Using criteria such as age, BMI, or prior bariatric surgery did not reflect worse outcomes in a specialized outpatient surgery center. With experienced surgeons, appropriate protocols, and a consistent operative team, SG can be performed safely in a freestanding ASC on the MBSAQIP high acuity patient. ASCs need to carefully consider these principles before implementing this type of outpatient program.

A118

Laparoscopic Conversion to Sleeve Gasterectomy for Failed Gastric Bypass: Report Of 50 Cases.

Nawaf Alkhalifah *Taoyuan Taiwan*, Wei-Jei Lee *Taoyuan Taoyuan*

Background: Laparoscopic gastric bypass is a commonly performed bariatric surgery for the treatment of morbid obesity. Revision surgery for patients who have gastric bypass complications is a challenge for bariatric surgeon. Our aim is to present the early results of the conversions of gastric bypass complications to sleeve gastrectomies.

Material and Methods: From January 2001 to December 2015, 50 of 2382 gastric bypasses underwent revisional surgery to convert gastric bypasses to sleeve gastrectomies. The demographic data, surgical parameters and outcomes were studied.

Results: The mean age of the study group was 35.0 years (range 20 to 55), and the average body mass index (BMI) prior to the reoperation was 25.3 kg/m². Seven patients had previous laparoscopic Roux-en-Y gastric bypasses (LRYGBs), and 42 had laparoscopic single anastomosis (mini-) gastric bypasses (LSAGBs). The main reasons for the revisions were malnutrition (58%), weight regain (10%), intolerance (18%) and others (14%). The revisional surgeries had longer operative times, greater blood loss and longer flatus passage times than the primary gastric bypass surgeries. Four patients (8.1%) developed major complications during revisional surgery, including three (6.1%) cases of leakage and one (2.0%) case of internal bleeding. No mortality was noted. After conversion to sleeve gastrectomy, the body weights of the patients remained stable, and all patients improved in terms of malnutrition, including anemia, hypoalbuminemia, and secondary hyperparathyroidism.

Conclusion: Conversion to sleeve gastrectomy is an effective and safe option for patients with gastric bypass complications. The conversions to sleeve gastrectomy resulted in significant improvements in malnutrition and maintained weight loss at the early follow-ups.

Paper Session IV: Complications

Thursday November 3rd, 2016 8:00am – 9:30am

A119

Discordance between surgeon self-reported and actual venous thromboembolism chemoprophylaxis is associated with increased venous thromboembolic events

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Background: Venous thromboembolism (VTE) remains the most common cause of mortality following bariatric surgery. In order to mitigate VTE risk, the Michigan Bariatric Surgery Collaborative

(MBSC) developed an evidence-based VTE risk calculator to guide dosing and duration of chemoprophylaxis. There is greater than 90% self-reported compliance with these guidelines amongst MBSC surgeons. We sought to determine the accuracy of self-reported dosing practices and whether the level of discordance is associated with increased risk of VTE.

Methods: We utilized prospectively collected, rigorously audited data from the MBSC-a statewide quality improvement program comprised of 38 hospitals with over 6,000 bariatric operations performed per year. Sixty-five participating bariatric surgeons were surveyed about their routine VTE chemoprophylaxis practices, including medication type, dosage, timing, and duration. All those that developed VTE and twenty other randomly selected patient charts were audited in each surgical practice to assess actual perioperative ordered and administered VTE chemoprophylaxis. We assessed the degree to which survey responses and chart abstracted medication administration were associated. Finally, we evaluated VTE and postoperative bleeding events based on degree of concordance between self-reported and actual chemoprophylaxis regimens. A contingency table analysis was performed to evaluate the interrelation between surgeon survey responses and chart data in both the pre-operative and post-operative setting.

Results: Pre-operative VTE dosing regimens demonstrated 26% overall discordance between self-reported and actual chart data. Among patients who had a VTE, 43% of chart responses did not match the surgeon survey responses. Conversely, among patients who did not have a VTE, only 23% were discordant. This difference was statistically significant ($p=0.005$). With post-operative VTE dosing, overall 32% of chart data did not match with the self-reported surgeon responses. There was again a difference in the proportion of discordance in patients with and without a VTE (53% discordance vs 27%, $p<0.001$).

Conclusions: Greater discordance between surgeon self-reported and actual peri-operative VTE chemoprophylaxis is associated with significantly increased risk of VTE. Further understanding of the macro and micro system characteristics of these practices may yield insights into how best to improve appropriate VTE chemoprophylaxis and translate evidence based guidelines into practice.

Superior Mesenteric Arterial Catheter Directed TPA for Treatment of Portal Vein Thrombosis and Superior Mesenteric Vein Thrombosis after Weight loss surgery.

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Background: Acute Portal Vein Thrombosis (PVT) and Superior Mesenteric Vein Thrombosis (SMVT) are relatively rare but insidious and potentially lethal abdominal diseases. Recently, there has been a significant increase in the number of these cases after bariatric surgery. Systemic anticoagulation as well as systemic tissue plasminogen activator (TPA) both have high failure rates in cases of high grade partial or complete occlusion of portal flow. In such cases, activated plasmin is shunted away from the thrombus. The failure rate also increases with delayed diagnosis, more organized thrombosis and a greater extent of mesenteric venous involvement. This study describes the effectiveness, safety and clinical outcomes of catheter directed tissue plasminogen activator (TPA) by route of superior mesenteric artery (SMA) for acute PVT and SMVT after weight loss surgery.

Method: Nine patients were identified with PVT and SMVT after weight loss surgery from a single practice. In all the patients, the diagnosis was established with a contrast enhanced abdominal CT scan, occasionally preceded by duplex ultrasound of the portal venous system. Depending on the extent of the thrombosis, thrombolytic therapy via SMA catheter was utilized. All patients received long term anticoagulation.

Result: Two out of nine patients received mesenteric portovenous TPA via a catheter placed in the SMA accessed by interventional radiologists using a femoral approach. Both the patients were admitted with abdominal pain, nausea and vomiting, approximately two weeks after their primary weight loss surgery. The CT scan for the first patient revealed occlusive thrombosis of SMV and branches of PV. Patient was initially started on heparin. Since there was no resolution for the clot, we electively decided to place SMA catheter and continuously infuse TPA at 1 mg/hour with a systemic heparin drip at 300 units per hour. We then titrated TPA to 1.5 mg/hour and continued heparin drip for next 3 days. The patient had complete resolution of the clot on subsequent CT scan and was later discharged on oral

anticoagulation. The CT scan for the second patient revealed nonocclusive thrombus of main PV and occlusive thrombus of the left intrahepatic PV. This patient was treated with TPA continuously infused by SMA catheter at 1mg per hour along with a systemic heparin drip at 400 units per hour for less than 36 hours. However, we could not titrate TPA to 2 mg/hour as the radiologist pulled the catheter prematurely. This patient did not improve and was later put on systemic anticoagulant. Over next few days, her symptoms improved but her clot did not dissolve. She was discharged on oral anticoagulant.

Conclusion: Catheter directed mesenteric portovenous clot perfusion with TPA can be beneficial in patients with SMVT and PVT occurring after weight loss surgery. The greater risk of systemic TPA is avoided by the lower total dose required and by significant reduction of plasmin exposure to the gastric staple lines. It also helps preventing systemic bleeding risk and achieving an excellent mesenteric anticoagulation with much lower systemic aPTT. However, TPA needs to be titrated till 2mg per hour for at least 36 hours for complete dissolution of the clot.

A121

Post-Operative Home Nursing Program Decreases Bariatric Hospital Revisits

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Background: Bariatric surgery has been proven to effectively treat obesity and its related comorbidities[1][2][3]. High readmission rates following bariatric surgery have led public and private insurance companies to question the financial efficacy of these procedures. In our community hospital, a Bariatric Surgery Center of Excellence, the bariatric population is uniquely composed of almost 60% publically insured (Medicare/Medicaid) patients, a population more likely to seek care in the emergency department (ED)[4]. Our previous retrospective chart review determined that the ED visit and hospital readmission rate due to any cause in our post-operative bariatric patients was 23.6% and that most occurred during the six weeks immediately post-surgery. Approximately 30% of these were due to the common post-surgical triad of dehydration, nausea/vomiting, and the resulting non-specific

abdominal pain. [5] Inspired by cardiothoracic surgeons who have decreased hospital readmissions by having nurse practitioners perform home care visits on coronary artery bypass graft (CABG) patients[6], we designed a similar program to target our bariatric patients.

Methods: To decrease readmission rates and costs, we developed a protocol for home healthcare visits (HHV) twice in the first month following surgery, with a specific focus on early diagnosis of dehydration. We recruited 193 patients into the study from January 2014 to August 2014. An HHV was scheduled for all participants approximately 72 hours after discharge from the hospital and at 3 weeks post-operatively. In addition, all patients had their first post-operative office visit 10-14 days after surgery, ensuring that all patients were assessed once per week for the first month after surgery. A checklist concerning patients' diet, lifestyle choices, and physical exam findings consistent with dehydration was provided to each home health nurse as well as to the patients on discharge. If the patient showed early signs of dehydration they received home hydration therapy or were referred to the ED for evaluation. Treatment at home and in the ED included infusion of one banana bag (1mg Folic Acid, 100mg Thiamine, Multivitamin in 1L NSS) and at least 2-liter boluses of normal saline. A Chi-square analysis compared 30-day revisit rates due to any complaint and 30-day revisit rates due to dehydration before and after establishment of the HHV program.

Results: Of the 193 patients who received HHV, 23 patients (11.9%) returned to the hospital with a diverse number of complaints, only some of which were related to their surgery; 12 patients (6.2%) had revisits specifically for dehydration. Revisits for dehydration decreased by 28% ($p=0.4$) and all-cause hospital revisits were reduced by 50% ($P<0.01$) from rates prior to the HHV program. Patient demographics as well as the overall number and type of medical comorbidities were comparable in those patients who returned to the hospital when compared to those who did not. No single comorbidity predicted hospital revisits.

Conclusions: The financial burden of post-operative complications and readmissions following bariatric surgery has garnered concern about cost-effectiveness. ED visits and hospital readmissions are especially common in publically insured patients, a population primarily served by our practice. We found that two HHV's specifically assessing adherence to post-operative diet and lifestyle

changes and signs/symptoms of dehydration significantly decreased all-cause revisit rates. The addition of an assessment focused on bariatric post-operative concerns by a home nurse to standard follow-up practices ensures that patients are evaluated weekly during the first month following surgery. The cost of an ED visit for rehydration is approximately \$3,000 and a 2-day inpatient admission can cost upwards of \$18,000, while two HHV's cost \$300. This simple and inexpensive intervention drastically decreases the need for publically insured patients to seek care in the ED and return to the hospital.[1] McCarty TM, Arnold DT, Lamont P et al: Optimizing outcomes in bariatric surgery: outpatient laparoscopic gastric bypass. *Ann Surg.* 2005; 242: 494-98.[2] Nguyen NT, Hossein M, Laugenour K, et al. Predictive factors of mortality in bariatric surgery: Data from the Nationwide Inpatient Sample. *Surgery.* 2011; 150:347-51[3] Christou NV, Sampalis JS, Liberman M, et al. Surgery decreases long-term mortality, morbidity, and health care use in morbidly obese patients. *Ann Surg.* 2004;240:416-23[4] Garcia et al. 2010. Emergency Department Visitors and Visits: Who Used the Emergency Room in 2007? CDC, NCHS Data Brief No 38.[5] Karas LA, Schultz S, Siddeswarappa M, Slane S, Ramachandra P, Goldenberg EA. *Preliminary Report on Home Nurse Visits for Prevention of Readmission for Dehydration following Bariatric Surgery.* Mercy Catholic Medical Center, Philadelphia, PA. Poster presented at SAGES 2015, Nashville, TN.[6] Hall MH, Esposito RA, Pekmezaris R, Lesser M, Moravick D, Jahn L, Blenderman R, Akerman M, Nouryan CN, Hartman AR. Cardiac surgery nurse practitioner home visits prevent coronary artery bypass graft readmissions. *Ann Thoracic Surg.* 2014 May;97 (5): 1488-93.

A122

Readmission rates after bariatric surgery in Sweden – a population based study.

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Background: Several studies have addressed short-term readmission rates after bariatric surgery. However, studies on long-term readmission rates are few and population based studies are even scarcer. The aim of this study was to assess short-term (1-30 days), medium-term (31-365 days) and long-term

(366-720 days) readmission rates after bariatric surgery in Sweden.

Methods: Data from the Scandinavian Obesity Surgery Registry (SOReg) (>50 000 procedures, 96% Roux-en-Y gastric bypass, 95% laparoscopic, 99% coverage) between 1998 and 2013 was cross-referenced with the national patient registry (NPR) (100% coverage) to assess all readmissions, at all Swedish hospitals, after bariatric surgery. The different ICD10 and NOMESKO surgical procedures codes were used to classify the readmission as all cause or gastrointestinal. Furthermore, we assessed to which degree a severe complication according to the Clavien-Dindo classification impacted readmissions.

Results: The all cause readmission rates were 7, 18 and 25%, during the 1-3, 30-365 and 366-720 days, respectively after surgery. The readmission rates with a gastrointestinal diagnosis/surgical procedure were 3, 8 and 9%, respectively. There was a large degree of variability in the all cause readmission rates between the different primary surgical departments in Sweden (range 2.8-15%) during the first 30 days and (range 13-33%) during the second year after surgery. Patients with a severe complication after surgery were at a higher risk of all cause readmission compared to those without a surgical complication (50, 35, 30% and 4, 16, 23%, respectively, at 1-30, 31-365, 366-720 days post-operatively). There was a trend of decreased readmission rates during the study period.

Conclusion: This population based study demonstrates a significant risk of readmission after bariatric surgery in Sweden with readmission rates slightly higher than those previously reported in the literature. One reason for this may be the nationwide coverage of this study. An early severe complication was associated with a significantly higher all cause readmission rate during the first postoperative year which also carried through to the second post-operative year.

A123

Buttressing of the EEA stapler during gastrojejunal anastomosis decreases complications for laparoscopic gastric bypass

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Background: Bariatric surgery is a safe and effective treatment for morbid obesity, a chronic condition affecting one-third of the U.S. adult population. Newer surgical techniques and equipment have improved safety standards surrounding bariatric surgery. These include enhanced optics, insufflation equipment, and advanced stapling technology. In particular buttressing of the staple line in sleeve gastrectomy has been shown to decrease rates of clinically significant postoperative bleeding. The current study investigates the effectiveness of buttressing the circular stapled anastomosis during Laparoscopic Roux-en-Y gastric bypass (LRYGB).

Methods: 243 patients undergoing LRYGB at a single academic institution were included in this retrospective study between 2014 and 2015. Buttressing material was used in 128 of these cases while 125 cases did not use buttressing material. The buttressing material (Gore) was placed on the anvil of the EEA stapler as well as the end of the EEA stapler. Demographic information was collected from both groups preoperatively. Body mass index (BMI) and percentage of excess weight loss (%EWL) were calculated pre- and postoperatively. Surgical characteristics were also obtained including operating time, length of stay, and rates of complications, readmissions, and reoperations. Continuous and dichotomous variables were analyzed using unpaired-t or Chi-square tests, respectively, using GraphPad Prism v6.01.

Results: There were no significant demographic differences between the two groups prior to surgery; both buttressing and non-buttressing groups were on average 46 years old and predominantly female (79.2% vs. 74.2% female, respectively), with a BMI of approximately 48 kg/m². Postoperative weight loss did not significantly differ between groups at any time point (buttressing vs. non-buttressing %EWL: 39.5% vs. 41.5% at 3 months, p=0.3860; 56.4% vs. 56.7% at 6 months, p=0.9341). Similarly, there were no significant differences for operating time, length of stay, readmissions, or reoperations. Specific rates of bleeding-related complications were significantly lower for the group in which buttressing was utilized (0.0% buttressing vs. 3.1% non-buttressing, p=0.0463). Complications due to strictures trended to be lower for the buttressing group (0.0% buttressing vs. 2.3% non-buttressing, p=0.0851).

Conclusion: The incidence of complications following LRYGB has decreased over the past several decades, yet bleeding from the gastrojejunal anastomosis remains a primary concern for both surgeon and patient. Buttressing of the GJ anastomosis during

LRYGB significantly reduces bleeding-related complications and increases safety of the procedure.

A124

Surgical management of gastroparesis: A single institution experience

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Background: Gastroparesis (GP) is a chronic disorder of gastric motility with delayed gastric emptying. The gastric electrical stimulator (GES) implantation and Roux-en Y bypass surgery (RYGB) are surgical options for medically refractory GP. The aim of this study was to evaluate the surgical outcomes of GP patients who underwent surgical treatment at our institution.

Methods: A retrospective chart review was performed of all patients who underwent surgical treatment of GP from February 2003 to December 2014. Subgroup analysis was performed based on the etiology of the GP, diabetes mellitus (DM) vs. idiopathic (IP), and the type of procedure (GES vs RYGB). Postoperative outcomes and postoperative symptom improvements were assessed and compared between these groups.

Results: A total of 93 patients were identified. Based on etiology 47 (50.5%) had DM and 46 (49.5%) had IP. Based on surgical treatment the majority of patients (83.8% n= 78) underwent GES implantation, whereas 15 patients (16%) had RYGB. When analyzing the population based on etiology, there are significant differences in hospital-stay (2.0 (1.0-4.0) vs 3 (2.0-7.8) days; p=0.03) and reoperation rate (30% vs 7%, p<0.01) between the idiopathic and diabetic patients when they were matched within the same procedure. Operation time, complication rate, and 30-days readmission rate were similar in the both groups. Reoperation rate was higher in IP than in DM (29% vs 7%; p<0.01). DM patients significantly improved their GP related complains (nausea, vomiting and abdominal pain) compared to preoperatively (76% vs 21%, 63% vs 14% and 42% vs 13%, p<0.01). In addition, IP patients also improved significantly nausea and vomiting but not abdominal pain (95% vs 32% and 87% vs 45%, p<0.01, 37% vs 24% p=0.16). On other hand the analysis based of surgical treatment we found that there are significant differences in hospital-stay 4 (3.0-5.0) vs 2

(1.0-4.8) days; $p=0.01$) and operation time 180 (155-211) vs 150 (120-150) min, $p<0.01$ between RYGB and GES. However, complication, 30-days readmission and reoperation rates were comparable in the both groups (6% vs 0%, $p=0.19$, 6% vs 17%, $p=0.32$, 6% vs 21%, $p=0.20$ respectively). GES showed significant improvement of the symptoms nausea, vomiting and abdominal pain (83% vs 27%, 80% vs 36% and 37% vs 20%, $p<0.01$). However, RYGB only showed improvement of nausea, but not of the vomiting and abdominal pain (100% vs 20%, 40% vs 20%, 50% vs 10%, $p<0.01$, $p=0.14$, and $p=0.29$). The average follow up for all our population was 410 days (182-857)

Conclusions: Surgery is feasible and effective for GP treatment for both DM and IP patients. However there is special care needed for the postoperative period for IP patients due to the high incidence of reoperation. Although both procedures have some degree of efficacy, GES seems to provide improvement of more of the GP symptoms.

A125

Readmissions Affect Reimbursement in Bariatric Surgery, But What is Under Provider Control?

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Geisinger Medical Institution¹ Geisinger Medical Center²

Background: Hospital readmissions have become a key surrogate for quality with higher rates of readmission resulting in financial penalties. Therefore, understanding the factors that predict readmissions and how to limit them is of increasing importance. Our group has previously found the 47% of readmissions after primary stapled bariatric surgery (PSBS) - both sleeve gastrectomy and gastric bypass were preventable and about 22% were for less than one midnight. This study raised concerns that not only clinical, but non-clinical factors could be driving readmissions. These factors include payer, travel time to hospital, and readmissions outside of index hospital. The purpose of this study was to better understand the influence of non-clinical factors on readmission after primary bariatric surgical procedures.

Methods: This is an IRRB-approved retrospective cohort study of all patients undergoing PSBS from May 1, 2007 through April 30, 2015 in a single hospital within a large health system. Data was collected from an electronic medical record (Epic, Verona, WI) that is used in all inpatient and

outpatient facilities in our health system. Payer status was reviewed and distance from home to the index hospital was measured. Patient were grouped as greater than or closer than 50 miles from the hospital. Potential readmissions outside of the index hospital were identified by analyzing the proportion of readmissions who came through a transfer center. Univariate and multivariate analysis were carried out using logistic, Bonferroni and Poisson regression models.

Results: Two thousand fourteen total patients were selected for this study; of which 113 patients (5.3%) were readmitted. Follow up was 99% at 30 days. Patients undergoing PSBS were grouped by payer to include Medicare, Medicaid, Geisinger Health Plan (GHP) and other commercial health plans. Their demographics were similar except that Medicaid patient had significantly higher BMI and were younger, while Medicare patient were older and GHP patients were significantly more likely to live within 50 miles of the index hospital. In readmitted patients, the age differences were similar by payer but there was no significant difference in BMI between the groups. Logistic regression was used to compare outcomes between each of the four payer groups and we found no significant difference (set at $p<0.20$ on univariate analysis) in overall or preventable readmission rates by payer. Distance from index hospital was not significantly associated with overall or preventable readmissions. Of the 113 readmitted patients, 23.0% ($n=26$) were transferred to the index hospital from a remote medical facility. Patients with preventable readmissions were more likely to be transferred than those with non-preventable readmissions (51% v 33%; $p = 0.11$) but this was not significant.

Conclusions: Many studies, including our own, have demonstrated that nausea, vomiting and dehydration as a symptom complex represent the most common reason for preventable readmission after SG and RYGB. We previously identified leak, major complications and extended LOS as factors significantly associated with readmission in this population of patients. Our goal was to investigate whether non-clinical factors including payer, hospital transfer or residing greater than 50 miles from the medical center were significant predictors of readmission. None of these non-clinical factors significantly predicted either overall or preventable readmissions. Nearly 23% of readmitted patient initially presented to an emergency department or were admitted to another facility. Our health system has a transfer center that facilitates all transfers

from outside health care facilities. Our nursing team contacts every patient after discharge and when an appointment is missed. These transferred patients represent potential missed readmissions in this absence of an integrated health system with the

resources to route all patients to the index hospital. While this system is clinically effective at ensuring best care for bariatric patients, the paradox is that a more efficient system to route such patients to the index hospital may lead to reimbursement penalties.

Paper Session V: Comparative Studies

Thursday November 3rd, 2016 1:30-3:00

A126

Comparative Outcomes of Totally Robotic Roux-en-Y Gastric Bypass (TR-RYGB) Between Individuals with Super-Super vs. Morbid Obesity

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Florida Hospital Celebration Health¹

Background: Individuals with super-super obesity, i.e. body mass index (BMI) ≥ 60 , as compared to their less obese cohorts, are at greater risk for complications with Roux-en-Y gastric bypass (RYGB) due, in part, to a higher incidence of co-morbidities at the time of surgery. Furthermore, such a severe state of obesity imposes a number of technical challenges to the surgeon in performing laparoscopic RYGB, including increased torque and a significantly reduced visual field. The robotic platform system may be helpful in lowering surgical risks for individuals with super-super obesity due to its 3-D vision, intuitive motion, enhanced dexterity and ergonomic advantages over the conventional laparoscopic approach. In this study, we have assessed surgical risks and outcomes of TR-RYGB for patients with super-super obesity and compared these outcomes to those of an age- and gender-matched group of patients with a less severe stage of obesity (BMI 40-49).

Methods: The study population included 1,231 TR-RYGB patients, with 125 or 10.1% of the population having a BMI ≥ 60 and follow-up visits ≥ 24 months post-surgery. These individuals were gender- and age-matched to an equal number (n=125) of RYGB patients with a BMI < 50 (40 to 49). Outcome measures included: operative time, intra-operative complications and conversions, length of hospital stay (LOS), in-hospital complications/reoperations, 30-day readmissions and reoperations, 30-day mortality, and total % change in BMI and in excess weight loss (EWL) at postoperative months 6, 12, and 24.

Results: As patient groups were gender- and age-matched there were no differences in these preoperative variables, mean age = 42.7 years and

female-to-male gender distribution = 87/38 for both populations. Health status (ASA and co-morbidities) for individuals with super-super obesity was significantly ($p < 0.01$) worse than for the leaner cohort. Operative times were significantly ($p < 0.0001$) longer for those with super-super obesity vs. morbid obesity (128.5 ± 2.52 and 119.8 ± 2.73 min, respectively) and there was a trend ($p = 0.09$) toward a longer hospital stay for patients with super-super obesity (2.31 ± 0.08 vs. 2.12 ± 0.07). Intra-operatively, neither patient population experienced complications or required a conversion to a traditional laparoscopic or open procedure. The complication rates during the hospital stay were identical (1.6%) between the groups, as were the number of surgical reoperations (2 per group). There were also no differences in 30-day readmission rates between the populations (4.8%), and 83% of 30-day readmissions for individuals from either obesity group were caused by malaise (5 out of 6 readmission). 30-day reoperations averaged 0.8% (n=1 cholecystectomy) for the super-super obese and 0% for the less obese cohort. Mortality rates for the first 30 days were 0% among patients from both study groups. Furthermore, with the total robotic system, there were no anastomotic leaks. Weight loss (% change in BMI) was similar ($p > 0.05 = NS$) between the comparative groups at 6, 12, and 24 months, i.e. at 6 months 27% vs. 26%, 35% vs. 36% at 12 months, and 36% vs. 36% at 24 months for those with super-super obesity vs. morbid obesity, respectively. Despite the massive weight loss, the BMI of individuals who, prior to surgery, suffered from super-super obesity remained above a mean of 40 at both 12 and 24 months postoperatively and, as has been reported by numerous other investigators, % EWL at 6, 12, and 24 postoperative months was significantly less for patients who had initially been super-super obese as compared to their less obese counterparts.

Conclusions: Individuals with super-super obesity have no higher morbidity and mortality risks with TR-RYGB than do their less obese counterparts and all TR-RYGB patients experience low rates of

complications, along with 0% 30-day mortality and 0% anastomotic leaks.

A127

YEAR 2 OUTCOMES IN A RANDOMIZED SHAM CONTROLLED TRIAL REPORTING WEIGHT LOSS AND SAFETY OF TARGETED USE OF ENDOSCOPIC SUTURE ANCHORS FOR PRIMARY OBESITY: THE ESSENTIAL STUDY

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Surgical Specialists of LA¹ Washington University, St. Louis MO² HonorHealth Bariatric Center, AZ³ Baptist Memorial Memphis, TN⁴ Lexington Medical Center, Columbia, SC⁵ University of Miami, Miami, Florida⁶ St. Luke's Hospital, Kansas City, MO⁷ NorthShore Health System Evanston, IL⁸ U of Minnesota, Minneapolis, MN⁹ Chattanooga Bariatrics, Chattanooga TN¹⁰ Brigham and Women's Hospital, Boston MA¹¹ University of Denver, Denver, Colorado¹²

Background: The g-Cath™ EZ Delivery Catheter with Snowshoe Suture Anchors, part of the Incisionless Operating Platform™ (USGI Medical, San Clemente, CA, USA), was previously cleared by the FDA to plicate gastric tissue endoscopically. The purpose of the Essential™ study was to evaluate targeted anchor placement in the gastric fundus and distal gastric body (*pose*™ procedure) for weight loss in a randomized, blind, sham-controlled trial. The *pose* procedure demonstrated significant weight loss and a good safety profile in patients with Class I and Class II obesity across 11 sites with 2:1 active to sham randomization. The Serious Adverse Event (SAE) rate was under 5%, consistent with a low-moderate risk device. Weight loss and safety of the active and sham cross-over groups during Year 2 with continued low-intensity lifestyle follow-up is reported.

Methods: 332 patients were randomized with 2:1 randomization to active (n=221, mean BMI 36.0) or sham (n=111, mean BMI=36.2) groups across 11 sites. Aftercare was limited to 6 visits in both groups during Year 1, consistent with low-intensity lifestyle therapy. After 12 month unblinding, sham subjects were offered to undergo the active intervention or continue with Year 2 nutritional follow-up. Those who crossed-over to the active group were followed with the same 6 limited office lifestyle visits as in Year 1 with the addition of nutritional phone follow-up at 2 weeks, 2 months, and 4 months. Active subjects at enrollment continued to be followed for adverse events related to device or procedure as well as weight loss outcomes at 15, 18, and 24 months.

Results: At 12 month unblinding, the active group had lost 3.6x the %TWL compared with the sham group (p<.0001) as previously reported. There were no SAEs during Year 2 in any of the active subjects related to the device or the procedure. There were 3 accommodative SAEs in the cross-over group (3/73=4.1%) all related to a prolonged stay or readmission during Week 1 post-procedure due to pain, nausea, or vomiting. All resolving in X days without sequelae. For those active subjects that followed up at 15 and 18 months, 86% of the weight loss at 12 months was maintained at 15 months (4.9% TWL, N=154, 74% of subjects) and 79% was maintained at 18 months (4.2% TWL, N=139, 67% of subjects). Most sham subjects chose to undergo the active intervention (73/95= 77%). In sham cross-over subjects, mean %TBWL at 6 months was 6.7% (N=56).

Conclusions: The *pose* procedure continues to be a safe sutured weight loss procedure associated with clinically significant weight loss that is maintained beyond one year. It has the potential to be a beneficial early non-surgical weight loss option for patients with Class I/II obesity.

A128

Comparative Effectiveness of Sleeve Gastrectomy and Gastric Bypass in the Elderly Population

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East Carolina University¹ American Institutes for Research²

Background: Bariatric surgery in the elderly population remains a controversial but important issue. At least one third of American adults over age 65 suffer from obesity, with the prevalence expected to increase as the population ages. Currently, laparoscopic sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (GB) are the most commonly used bariatric procedures. The objective of this study is to compare perioperative safety, weight loss, and comorbidity reduction after SG and GB in elderly patients aged 65 years and older.

Methods: The Bariatrics Outcomes Longitudinal Database from 2007-2012 was used to identify patients ≥ 65 years of age that underwent non-revisional laparoscopic SG or GB. Propensity matching adjusted for differences in age, BMI, gender, American Society of Anesthesiologists (ASA) classification, as well as pre-operative comorbidities including asthma, congestive heart failure, functional status impairment, diabetes mellitus, hypertension, hyperlipidemia, liver disease, and peripheral vascular disease. Odds ratios (OR) with 95% confidence intervals (CI) are reported as indicated.

Results: We identified 7,958 total patients in the defined study period with ages ranging from 65 to 86 years, of which there were 842 SG patients and 7,116 GB patients. Our propensity matched cohorts consisted of 841 SG patients and 841 GB patients, with small differences in age (67.5 \pm 2.8 vs 67.6 \pm 2.5, $p=0.032$, OR=1.01, 95% CI 0.97- 1.04) and BMI (44.4 \pm 7.4 vs 45.1 \pm 6.7, $p=0.001$, OR=1.02, 95% CI 1.00- 1.03), but no differences in male gender (36.4% vs 37.2%, $p=0.723$, OR=1.04, 95% CI 0.85- 1.26) or ASA >2 (79.0% vs 80.4%, $p=0.467$, OR=1.09, 95% CI 0.86- 1.39). There were no significant differences in pre-operative comorbidities. SG patients had lower rates of 30-day complication (6.7% vs 12.4%, $p<0.001$, OR=1.98, 95% CI 1.41- 2.78), reoperation (1.1% vs 2.5%, $p=0.027$, OR=2.37, 95% CI 1.08- 5.20), and readmission (2.9% vs 5.8%, $p=0.003$, OR=2.11, 95% CI 1.28- 3.47) compared to GB patients. SG patients experienced less %TWL at 12 months (26.2 \pm 8.0 vs 31.1 \pm 8.8, $p<0.001$, OR=1.07, 95% CI 1.05- 1.10). There were no differences in 12-month resolution rates of diabetes mellitus (48.5% vs 50.3%, $p=0.777$, OR=1.07, 95% CI 0.65- 1.77), hypertension (28.4% vs 32.5%, $p=0.383$, OR=1.22, 95% CI 0.78- 1.89), hyperlipidemia (28.3% vs 33.5%, $p=0.328$, OR=1.27, 95% CI 0.78- 2.07), or obstructive sleep apnea (41.0% vs 48.9%, $p=0.208$, OR=1.38, 95% CI 0.88- 2.26) in SG and GB patients, respectively.

Conclusion: After controlling for baseline patient characteristics in a propensity-matched analysis, elderly patients undergoing SG experienced less post-operative morbidity, but had similar 12-month comorbidity resolution rates, compared with GB patients. Our findings favor performance of SG in the elderly population.

A129

Sleeve gastrectomy is safer than gastric bypass for patients with chronic renal failure

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Background: For patients with chronic renal failure (CRF) on dialysis, bariatric surgery may offer substantial benefit in terms of improved renal function, increased likelihood of receiving a kidney transplant and/or improved outcomes with subsequent kidney transplantation. However, the safety of bariatric surgery in these patients is unclear. The goal of this study was to compare rates of 30-day adverse events and resource utilization after bariatric surgery in patients with and without renal failure.

Study Design: We analyzed data from the Michigan Bariatric Surgery Collaborative for patients undergoing laparoscopic gastric bypass (LRNY) or sleeve gastrectomy (LSG) between June 2006 and March, 2016. Chronic renal failure was defined as requiring hemodialysis or peritoneal dialysis. Outcomes at 30 days, baseline characteristics and percent excess weight loss at 1 year were compared using Fisher's exact, Chi-square or Student's t-test as required. Surgical complications included anastomotic/ staple line leak, hemorrhage, obstruction and infection, while medical complications included cardiac complications, respiratory complications, venous thromboembolism and renal failure (for non-CRF patients). Serious complications encompassed those medical and surgical complications that were life-threatening or potentially life-threatening.

Results: During the study period, 24,593 patients underwent LRNY and 23,825 underwent LSG. Patients with CRF numbered 75 (0.3%) in the LRNY cohort and 141 (0.6%) in the LSG cohort. Patients with CRF were older (mean age 52.0 vs. 45.9 years, $p<0.0001$), had more comorbid conditions (mean 6.5

vs. 4.6, $p < 0.0001$), and were more likely to be male (38.9% vs. 22.0%, $p < 0.0001$), have a history of smoking (49.5% vs. 41.2%, $p = 0.015$), and have mobility limitations (19.0% vs 5.8%, $p < 0.0001$). There was no significant difference in baseline BMI (mean 48.7 vs. 48.5, $p = 0.5937$). Patients with CRF did not experience significant differences in rates (%) of surgical complications (13.3 vs. 8.4, $p = 0.1407$ with LRNY; 5.0 vs. 3.1, $p = 0.02117$ with LSG). However, those with CRF did experience significantly higher rates of serious complications (10.7 vs. 3.3, $p = 0.0033$ with LRNY; 5.0 vs. 1.7, $p = 0.0114$ with LSG), medical complications (9.3 vs. 1.8, $p = 0.0005$ with LRNY; 3.6 vs. 1.0, $p = 0.0135$ with LSG), readmissions (12.0 vs. 5.4, $p = 0.0206$ with LRNY; 10.6 vs. 3.7, $p = 0.0003$ with LSG) and ED visits (21.3 vs 9.5, $p = 0.0022$ with LRNY; 12.8 vs. 7.9, $p = 0.0405$ with LSG). Mortality was significantly higher for patients with CRF undergoing LRNY (2.7 vs. 0.13, $p = 0.005$) but not for those undergoing LSG (0.7 vs. 0.1, $p = 0.101$). There was no significant difference in excess weight loss at 1 year following LRNY (65.8% vs. 66.8%, $p = 0.782$) or LSG (54.9% vs. 57.5%, $p = 0.333$).

Conclusions: When compared to patients without CRF, those with CRF were at significantly higher risk for serious complications, readmissions and ED visits after bariatric surgery. These differences were especially pronounced following LRNY, after which mortality was also significantly higher in patients with CRF. Despite the higher operative risks for patients with CRF, 1-year weight loss is similar to patients without CRF.

A130

Long-term Efficacy of Laparoscopic Sleeve Gastrectomy versus Roux-en-Y Gastric Bypass: Which One Dominates? A Meta-analysis of Comparative Studies

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Background: Bariatric surgery has proved to be the only durable treatment option for morbid obesity. However, due to challenges in the documentation of patients' follow-up, we do not know much about its efficacy in the long-term.

Objective: The current meta-analysis aimed to pool available data on the long-term efficacy of laparoscopic Roux-en-Y gastric bypass (LRYGB) and compare it against the outcome of laparoscopic sleeve gastrectomy (LSG).

Methods: A comprehensive literature review was performed using MEDLINE/PubMed, Scopus, ISI Web of Science, and Embase to retrieve comparative studies tabulating the long-term outcome of patients undergoing LRYGB versus LSG. A Mantel-Haenszel Fixed method was employed using Review Manager software (RevMan Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2016).

Results: A total of 6 comparative studies encompassing 1'938 patients (1092 LRYGB and 846 LSG) were included. The average duration of follow-up was at least 60 months (Table1). Long-term weight loss had a small standardized mean difference when compared between LRYGB and LSG (0.12 [-0.01-0.24], $p = 0.06$) (Fig.2). However, meta-analysis for resolution of type2 diabetes mellitus (4.66 [1.64-13.3], $p = 0.004$), hyperlipidemia (3.43[1.07-11.02], $p = 0.04$), and hypertension (3.86 [1.34-11.15], $p = 0.01$) favored LRYGB against LSG (Fig.1).

Conclusion: Our meta-analysis revealed no significant difference between LRYGB and LSG for long-term weight loss. However, patients with comorbidity such as type2 diabetes mellitus, hyperlipidemia, or hypertension seem to benefit more from LRYGB than from LSG.

Paper Session VI: Malabsorptive & Metabolic

Thursday November 3rd, 2016 3:45pm – 5:15pm

A131

Long-term results after One anastomosis-gastric bypass for super-super obesity (BMI \geq 60 kg/m²)

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Background: Super-Super Obese (SSO) (BMI \geq 60 kg/m²) patients have higher risk due to multiple comorbidities. It is traditional to say that they are those for whom bariatric procedures have the potential to benefit the most, even if there could be restriction to decide surgery because of these comorbidities and assumed increased operative

difficulty. The biliopancreatic diversion with duodenal switch is the usual indication for SSO but the laparoscopic One Anastomosis-Gastric Bypass (OAGB) appears to be a promising one-stage procedure in these frail and challenging patients because of simplicity, safety and efficacy (interesting benefice/risk balance). Short- and long-term results from our first OAGB have been previously reported; however, long-term outcomes of OAGB for SSO patients have not yet been analyzed.

Objectives: To assess 5-year outcomes of OAGB for super-super obesity.

Setting: University public hospital, France.

Methods: 428 patients, who underwent SAGB between October, 2006 and November, 2010, were included in this retrospective study. Complete five-year follow-up was available in 326 patients (76%), and these patients were analyzed. Outcomes regarding mortality, morbidity (i.e., Clavien-Dindo score, major complications were defined as adverse events \geq grade IIIb), weight loss (change in BMI and % excess BMI loss [%EBMIL]), comorbidities remission (Type 2 diabetes mellitus (T2DM) remission was defined as glycated hemoglobin (HbA1c) \leq 6.5% and no specific treatment at five years), and Gastrointestinal Quality of Life Index (GIQLI), were assessed. Lost to follow-up: Patients lost to follow-up (n=102) were not included in the study because of incomplete 5-year follow-up. Pre-operative clinical characteristics and postoperative course of these patients were compared to the study group. No significant differences were found between these missing patients and the study group.

Results: Patients' characteristics: Thirty-five patients (11 %) were SSO patients and two hundred ninety-one were NSSO patients (89%). The SSO group had a significant higher preoperative mean BMI of 64.7 \pm 4 kg/m², with higher preoperative hypertension (SSO=66% VS. NSSO=36%, p<0.001), sleep apnea (SSO=57% VS. NSSO=15%, p<0.001) and obesity hypoventilation syndrome rates (SSO=8.5% VS. NSSO=1%, P=0.02). No significant differences were found in age, gender, previous bariatric procedures (previous sleeve gastrectomy: SSO=2 (6%) vs. NSSO=14 (5%), NS) and other obesity-related comorbidities rate between the two groups. **Mortality and morbidity:** There were no deaths and major complications rate was 5% (n= 17/326) in the overall series. No significant differences in the global morbidity (SSO=11% (4/35) vs. NSSO=8% (23/291), NS) and major morbidity (SSO=8.5% (3/35) vs. NSSO=4.8% (14/291), NS) rates were found between the two groups. No anastomotic leak occurred in the

SSO group, two were surgically managed in the NSSO group. One biliary peritonitis caused by a traumatic injury on the afferent loop, occurred in the SSO group. Intractable biliary reflux occurred in three NSSO patients, and required conversion into RYGB. Two NSSO patients presented severe malnutrition and were reversed into a normal anatomy. Leakage, intractable biliary reflux and malnutrition, the three specific major complications related to OAGB in the short- and long-term, didn't occurred in the SSO group. **Weight loss:** At 5 years, mean BMI was 36.9 kg/m² and mean EBMIL was 68% in the SSO group; no significant differences were found when compared to NSSO (BMI=31kg/m², %EBMIL=72%). **Co-morbidities:** Sleep apnea remission rate were significantly higher in the SSO group (SSO= 85% vs. NSSO= 52%, p=0.014); no significant differences were found in the other comorbidities remission rates (Hypertension SSO=65% vs. NSSO=52%, NS; Hyperlipidemia: SSO=92% vs. NSSO=81%, NS; Joint pain: SSO=45% vs. NSSO=33%, NS; Type 2 diabetes: SSO=80% vs. NSSO=83%, NS). **Quality of life:** Overall GIQLI scores were statically similar (SSO=106.2 \pm 16 vs. NSSO=110.9 \pm 17, NS) but some significant differences were found: worse in 'upper gastrointestinal symptoms' (SSO=32.3 \pm 9.6 vs. NSSO=36.7 \pm 7.2, p=0.001) and better in 'psychological' scores (SSO= 18.5 \pm 2 vs. NSSO 16.5 \pm 3, p=0.003). Concerning upper gastrointestinal scores, no significant differences were found in gastro-esophageal reflux symptoms between the two groups.

Conclusion: At 5 years, OAGB for super-super obesity was safe and effective. No significant differences were found in morbidity and weight loss results when compared to NSSO patients. However, SSO patients had higher sleep apnea remission, and good quality of life.

A132

The Texas Experience of Stomach Intestinal Pylorus Sparing Surgery (SIPS) at one year

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Background: Duodenal switch (DS) is one of the most efficacious forms of bariatric surgical therapy available. However, diarrhea, malnutrition and internal hernias have hampered its widespread

adoption. Stomach intestinal pylorus sparing (SIPS) procedure is technically easier to perform than traditional DS with elimination of internal hernia, decreasing malnutrition and diarrhea. It still retains the same weight loss as traditional DS. The aim of this study was to detail our initial experience with SIPS procedure.

Methods: Retrospective analysis was performed on data from patients who underwent a primary SIPS procedure performed by two surgeons at one center from October 2013 to March 2016. All revisions of prior bariatric procedures were excluded. Non-linear regression analyses were performed for all follow-up weight loss data.

Results: One hundred thirty-four patients were available. Fifty four patients were beyond one year postoperative, with data available for 33 (60% followed up). The mean pre op body mass index (BMI) was 52.9± 9.5 kg/m². At one year, patients had an average change in BMI of 22.5 units (kg/m²) with an average of 41.1% of total weight loss and 68.9 % of excess weight loss. There were 9 early postoperative complications with 5 leaks from duodenoileostomy (3.7%), 1 small bowel injury (0.7%) and 3 patients were readmitted within 30 days with stricture in the duodenoileostomy needing dilation (2.2%). The strictures were due to technical issues and since we have changed our technique from linear to hand sewn no further strictures or leaks have occurred. In the long term postoperative complications, three patients had diarrhea (2.2%), two patients had malnutrition (1.4%), and two patients had dysphagia (1.49%). Two of the diarrhea patients required small bowel lengthening. The other diarrhea patient's complaints went away with time. The malnutrition occurred because of sleeve stricture and once treated did not recur.

Conclusions: SIPS had effective weight loss results that are comparable with traditional DS. It also had comparable short and long term morbidity. There were no incidence of bile reflux. Additional long term follow ups and larger study populations would be required to further evaluate the outcomes of this novel technique and assess long term complications.

A133

Prospective non-randomized comparison between Single-Anastomosis Duodeno-Ileal bypass with Sleeve gastrectomy (SADI-S) and Gastric Bypass, for the treatment of morbid obesity.

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Introduction: Single-anastomosis duodeno-ileal bypass with sleeve gastrectomy is a modification of the Roux-en-Y duodenal switch that has demonstrated to be safe and effective in the treatment of morbid obesity.

Aim: To compare results on obesity and comorbidities after SADI-S with those obtained after gastric bypass. Patients and method. One-hundred and four patients were consecutively submitted to SADI-S or Gastric Bypass between September 2009 and May 2011. Selection of the procedure was made by the endocrinologist and the surgeon, based on personal preferences. Mean age of the series was 48.8 years, mean weight 118 kilograms and mean body mass index (BMI) 44.5 kg/m². Seventy-five percent of the patients were female. Fifty-one patients were diabetics, 61 had hypertension and 48 had sleep apnoea. All procedures were completed laparoscopically. Gastric bypass was performed with a 150 meter alimentary limb, and 50 to 75 cm biliopancreatic limb. SADI-S was performed with a sleeve gastrectomy over a 54 French bougie and a 250 cm common limb. Gall bladder was removed in 8 cases.

Results: There were no differences in initial BMI, age, hypertension or sleep apnoea. There were more diabetic patients in the SADI-S group (33 vs 18, p < 0.001). All operations were completed successfully and there was no mortality. One anastomotic leak presented in the SADI-S group. One gastric pouch leak, one anastomotic leak, one jejunal perforation and one jejuno-jejunostomy leak presented in the gastric bypass group. There were more re-admissions in the SADI-S group (15% vs 8%, p = 0.3). Five-year follow up was 77% for SADI-S and 66% for gastric bypass. Weight loss was significantly better for patients undergoing SADI-S: final BMI was 28.8 vs 31.6 (p = 0.07), excess weight loss at five years was 83.8 and 69.4 (p = 0.04) and total weight loss 37% and 29% (p < 0.001). Failure rate at 5 years was 6% for SADI-S and 21% for gastric bypass. No differences in diabetes remission rates were observed between both groups. Two patients submitted to SADI-S were reoperated for undernutrition and 6 patients in the gastric bypass group were reoperated for insufficient weight loss (4), dumping (1) or intestinal obstruction (1).

Conclusions: When compared to gastric bypass, SADI-S behaves as an effective and safe technique for treating morbid obesity and its comorbidities.

A134

Diabetes resolution and control in overweight and not morbidly obese patients undergoing biliopancreatic diversion.

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In the severely obese patients with type 2 diabetes (T2DM) undergoing biliopancreatic diversion (BPD) the fasting blood glucose (FBG) normalizes just after the operation, when body weight is still in the obese range. Therefore, it can be suggested that the improvement of metabolic status is accounted for by specific not weight related factors. Therefore, it has been hypothesized that BPD could bring metabolic benefit to not morbidly obese T2DM individuals. This study was carried out on the overweight or mildly obese patients undergoing BPD specifically for curing the T2DM between September 2007 and June 2010; the sample includes the patients having participated to the pilot study and those having represented an investigation on the entero-hormonal changes after BPD. Furthermore other T2DM patients operated only for clinical purposes are considered: therefore, 80 operated T2DM patients were considered with a complete 5 years follow. The inclusion and the exclusion criteria were those of the original pilot study. Diabetes was considered as resolved when glycated hemoglobin (HbA1c) was lower than 6% and controlled lower than 7% at free diet and without antidiabetic therapy. Demographic anthropometric, biochemical and clinical data are referred to in the table: data obtained at one, three and five years after BPD were considered. The follow up rate was of 90% at five years after the operation. (FBG: fasting blood glucose)- Multiple logistic regression analysis indicated that the insulin therapy before the operation is the only preoperative predicting factor on the long term metabolic outcome. In spite of the clinically satisfactory results within the first postoperative year, the long term results are disappointing, at five years following BPD the T2DM resolution and control occurring in less than one third and half of the operated patients, respectively. The poor metabolic outcomes recorded at long term following the operation in the overweight and of the not morbidly obese T2DM

patients are likely accounted for by the lack of post BPD insulin secretion recovery (Scopinaro et al, SOARD 2015).

A135

Malabsorptive bariatric surgery in superobese patients: a very long-term follow-up study

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Background: Despite the large number of operated patients, long-term follow-up data on super (BMI > 50 kg/m²) and super super obese patients (BMI > 60 kg/m²) submitted to bariatric surgery is still scant. Aim of this study is to investigate overall all-cause mortality, weight loss, complications and revision rates in patients with a minimum BMI of 50 kg/m² and a minimum follow-up of 10 years submitted to biliopancreatic diversion (BPD) at our Institution.

Setting: Retrospective review of prospectively collected data. Tertiary referral University Hospital.

Methods: Among 248 patients who underwent BPD between 1991 and 1996 at our Institution, one-hundred and sixty-three patients (mean age: 37 ± 10,8; BMI: 57,5 ± 6,2), including 117 super obese and 46 super super obese, were followed up for a minimum period of 10 years (mean follow-up: 15,4 years ± 4,0). Overall weight loss and mortality were considered as primary outcomes, as well as the overall morbidity and revision rate. The post-operative evolution of chronic comorbidities such as DM II, dyslipidemia was also investigated.

Results: The observed overall mortality rate is 10% (25/248, including 6 peri-operative deaths). Four deaths were due to sequelae of recurrent protein malnutrition. Two patients died after colonic and uterine malignancies, and two due to alcoholic cirrhosis. Two patients died after motor vehicle accidents, and one committed suicide. Another as a consequence of drug dependence and abuse. Another two patients died after cardiac valve disease. One patient died after pulmonary embolism, and another after respiratory failure. The cause of death for three patients could not be determined. Super super obesity and age at the time of BPD < 20 or > 50 years were associated with a higher mortality rate, whereas super obese patients aged 20 to 50 reached the lowest mortality rate at 1,4% (2/139). The mean %EBL lost at the maximum follow-up was 72,8% in patients with at least 10

years of follow-up, increasing to 82,9% considering those with 20 or more years. One hundred and thirty-two patients (132/163, 81%) lost more than 50% of the EB. Microcytic anemia and osteoporosis were respectively observed in 12,9% and 5,5% of the patients. Only two patients underwent a surgical revision of BPD more than 10 years after the original intervention (Revision Rate: 1,2%, 2/163). Metabolic comorbidities and abnormal glucose, triglycerides and cholesterol values returned after BPD into normal ranges in nearly all cases.

Conclusions: Long-term weight loss results after BPD are excellent, but a high incidence of related and unrelated fatalities was detected.

A136

The impact of bariatric surgery in the epigenetics of patients with obesity and type 2 diabetes mellitus: A prospective study of the DNA methylation remodeling in adipose tissue

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Introduction: Diabetes and obesity are complex metabolic diseases influenced by genetic and environmental factors. [1-2]. Obesity induces a constant state of low-grade inflammation with infiltration and activation of immune cells. There is an increase on the production of proinflammatory cytokines, leading to insulin resistance, type 2 diabetes mellitus (T2DM) and cardiovascular disease [3]. Recently it has been reported that epigenetic alterations, especially DNA methylation, may have an important role in the pathogenesis of metabolic diseases [4]. Bariatric surgery is an optimal intervention in the treatment of obesity and associated comorbidities, representing an

opportunity to investigate epigenetic remodeling that may be related with an improved metabolic status associated to weight loss.

Methods: A prospective collaboration (2 Institutions) study was performed with every Mexican patient submitted to bariatric surgery (Laparoscopic Gastric Bypass) carrying morbid obesity and T2DM who were willing to participate. A subcutaneous (abdominal fat) adipose tissue (SAT) biopsy was collected at the moment of the bariatric surgery. Global profiles of DNA methylation were analyzed using Illumina Infinium HumanMethylation450K Bead Chip. Six months after the surgery, a SAT biopsy was collected again for all patients (under local anesthesia). DNA methylation profiles were evaluated and compared within groups. DAVID was used to enrichment analysis. We searched for differentially methylated CpG sites (DMCs), where a CpG site was defined as DMC when a p value < 0.05 and at least 0.05 absolute mean methylation difference.

Results: Twenty-four patients were enrolled (12 in each group) in the study. Baseline characteristics were comparable, except for expected differences in the metabolic parameters for the OD group. (Table 1) There were a total of 1152 CpG sites differentially methylated in OD compared with OB patients. Enrichment analysis showed that genes with DMCs are involved in metabolic pathways related to regulation transcription (p = 0.0005), cell adhesion (p = 0.02), regulation of cell proliferation (p=0.09) and negative regulation of macromolecules biosynthetic processes (p=0.02). Analysis of DNA methylation after 6 months showed changes in profiles in both OD and OB patients. Many of DMCs reversed their differences between both groups. (Figure 1) We also found sites with a high correlation between DNA methylation level and clinical parameters of improvement (lipid and metabolic profile)

Conclusion: There is a remodeling of the DNA methylation profiles in abdominal subcutaneous adipose tissue six months after bariatric surgery. Many genes with epigenetic remodeling were previously related to metabolic diseases, thus implying that weight loss could induce epigenetic changes that impact the metabolic status and health of patients with obesity.

A138

THE FIRST PROCEDURELESS GASTRIC BALLOON FOR WEIGHT LOSS: FINAL RESULTS FROM A MULTI-CENTER, PROSPECTIVE STUDY EVALUATING SAFETY, EFFICACY, PARTICIPANT PREFERENCE, AND LONG TERM FOLLOW-UP

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Background: Traditional gastric balloons for weight loss require endoscopy and anesthesia for placement and removal. Elipse™ (Allurion Technologies, Wellesley, MA USA) is the first procedureless gastric balloon. The balloon is swallowed, resides in the stomach for 4 months, and is then excreted.

Aims: The objectives of this study were to assess the safety of Elipse™ and to measure its short and long term effects on weight loss, quality of life, and participant preference.

Methods: Each participant swallowed one Elipse™ device, which was filled with 550mL of filling fluid through a thin delivery catheter that was then removed. Three different anti-emetic regimens (ondansetron, aprepitant, and ondansetron + aprepitant) were tried throughout the study. Weight and body composition were measured every 2 weeks by bio-impedance during balloon therapy. After balloon passage, weight was measured monthly although there was no dietary counseling provided. Quality of life was assessed at baseline and at trial exit using the Impact of Weight on Quality of Life (IWQoL) questionnaire. At trial exit, participants were asked if they would recommend Elipse™ to a friend or repeat it if they regained weight.

Results: Thirty-four participants were enrolled with a mean BMI of 34.8 kg/m². At 4 months, the mean

weight loss was 10.0kg, percent total body weight loss (%TBL) was 10.0%, and percent excess weight loss (%EWL) was 39%. 100% of the weight lost was from fat. All adverse events were either self-limiting or resolved with medication. Vomiting was significantly reduced using a combination of ondansetron and aprepitant. All balloons were safely excreted. At trial exit, IWQoL scores improved across all domains. In the absence of any post-balloon dietary counseling, 93% and 63% of the weight lost was maintained at 6-month and 9-month follow-up, respectively. 93% and 86% of participants would recommend Elipse™ to a friend or repeat it if they regained weight, respectively.

Conclusions: Elipse™ leads to weight loss on par with endoscopic balloons but does so without endoscopy and anesthesia and without sacrificing safety or the participant experience. In addition, in the absence of post-balloon dietary counseling, participants maintained nearly two-thirds of the weight lost during therapy at 9-month follow-up.

A139

Intragastric Balloon: Initial Experience with 160 Patients at a Multicenter Bariatric Practice

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Background: The ReShape™ Integrated Dual Balloon (IDB) is a safe and effective nonsurgical treatment for obesity recently introduced in the United States. We report on our initial experience to date with over 160 subjects treated with the IDB in a large multicenter bariatric practice.

Methods: Following nutrition evaluation, preoperative labs, and surgical consultation the IDB is placed endoscopically in an outpatient setting. Patients are pretreated with pantoprazole, ondansetron and alprazolam; following placement patients receive oral pantoprazole, ondansetron, alprazolam, and hyoscyamine. Patients are scheduled for monthly visits with a nutritionist and a physician assistant. Post-placement diet advances from clear liquid, to soft puree, to solid foods over two weeks. The balloon is removed endoscopically after 6 months. All subjects (n=160) who were successfully implanted with the IDB were analyzed

for baseline demographics, available weight loss data and safety profile.

Results: Implanted subjects (n=160) were 75% female with the following mean baseline values: age 45 (range 21-70), weight 234 lbs (range 157-450) and BMI 37.8 (range 27.7-65.6). The mean treatment duration was 101 days (range 7-211) with 45 IDBs retrieved and 115 still implanted. All attempted implantations were successful without complications. Mean maximal percent excess weight (EWL) loss for 62 subjects with 3 or more months of treatment was 37.6%EWL and 56% of subjects lost \geq 30%EWL. Female patients lost substantially more weight than male patients. Nine (9) subjects had early retrievals: balloon deflation (1), severe symptoms (3), dissatisfied with weight loss (2), undergoing elective orthopedic surgery (1), pancreatitis (1) and gastric outlet obstruction with perforation requiring surgical intervention (1). There were two balloon deflations, one with migration and spontaneous passage. Two ulcers were found upon retrieval, one with associated bleeding. Three subjects had mild pancreatitis which required hospitalization. All complications resolved without long-term sequelae.

Conclusion: Based on our experience to date, the IDB is effective for weight loss in appropriate patients, though practitioners must be cognizant of potential complications. Early removal due to patient intolerance or dissatisfaction can occur. Continued implantations and ongoing follow-up will result in a more comprehensive analysis of this nonsurgical weight loss option.

A140

A 6-month Swallowable Balloon System results in sustainable weight loss at 1 year: results from a prospective, randomized sham-controlled trial

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Background: The Obalon 6-Month Balloon System, three sequentially swallowed gas-filled balloons, plus moderate intensity lifestyle therapy demonstrated 1.9 times more weight loss than lifestyle therapy alone in a 6-month randomized sham controlled trial with 64% of patients achieving 5% or more total weight loss (%TWL). Weight loss at 12 months (6 months after device removal) is a potential indicator of weight loss maintenance after device removal.

Methods: This was a randomized sham controlled trial at 15 US centers including participants 22-64 years old with a BMI of 30 to 40 kg/m². A 1:1 randomization to the treatment group or the sham group was implemented. The Study included two phases. Phase 1 (Blinded) requested subjects to swallow three capsules (balloon or sugar-filled sham) by week 12 using an identical procedure. Swallowing of capsules was done in a progressive manner to enhance intragastric balloon tolerability and stimulate weight loss over the full treatment period. Subjects who swallowed at least two capsules and completed 18 weeks of therapy were included in the per protocol (PP) analysis. All subjects underwent 25 minutes of lifestyle therapy administered by a blinded registered dietitian every 3 weeks. At Week 24, the blind was revealed and the Obalon balloons were removed endoscopically. The co-primary endpoints were: 1) the difference in mean %TWL between the treatment group and sham group, and 2) a Responder Rate, defined as \geq 5% TWL, achieved in \geq 35% of participants. In Phase 2 (unblinded) the treatment group was followed for 6 months after removal where subjects continued with 25 minutes of lifestyle therapy administered by a registered dietitian every 3 weeks. The sham group was offered optional 6-month balloon therapy. Treatment group weight loss maintenance after balloon removal was calculated as %TWL and percent excess weight loss (%EWL) at 9 months, 11 months, and 1 year.

Results: 387 subjects swallowed at least one device. 366 subjects were included in the per protocol analysis. 185 subjects received Obalon balloon capsules (treatment group: age 42.8 \pm 9.5yrs, BMI 35.1 \pm 2.7 kg/m²) and 181 received sham capsules

(sham group: age 42.7 +/- 9.3yrs, BMI 35.3 +/- 2.7 kg/m²). %TWL at 6 months (previously presented) was 6.81 +/- 5.1% and 3.59 +/- 5.0% in the treatment and sham groups for a difference of 3.23 %TWL (p=0.034). Treatment group %EWL at 6 months was 24.9+-18.8%. 169 (91%) Treatment group subjects participated in the 6-month follow up (Phase 2), which is near completion. Figure 1 shows all data points collected on the 169 Treatment patients that participated in the 6-month follow-up phase. 160 treatment group subjects (95%) have completed 9 months of therapy (3 months following balloon removal) with %TWL of 6.7%+- 6.1% and %EWL of 24.8+-23.2%. At 11 months 159 treatment group subjects (94%) have maintained on average 86.7% of the weight loss after balloon removal. 92 (54%) treatment group subjects have completed 1 year of therapy with %TWL of 6.8% +/- 6.6% and %EWL of 25.2% +/- 26.0%. No unanticipated device events and a single (0.5%) serious adverse device event occurred during the balloon period (gastric ulcer after protocol prohibited nonsteroidal anti-inflammatory drug use for outpatient knee replacement, managed conservatively). Non-serious adverse device events (mostly abdominal cramping and nausea) occurred in 89.9% of subjects; 99.7% were rated mild or moderate.

Conclusions: The significant weight loss achieved with the Obalon 6-Month Balloon System is maintained at 12 months. This combination of lifestyle modification and Obalon balloon therapy provides a low risk option with sustained weight loss for patients with obesity.

A141

Early Experience with Intra-gastric Dual Balloon as Treatment for Obesity

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Stanford School of Medicine¹

Background: The ReShape™ Integrated Dual Balloon (IDB) is a safe and effective nonsurgical treatment for obesity and has been FDA approved since 2015 for individuals with a body mass index (BMI) 30-40 kg/m². However, only one prior study exists for the IDB in the U.S., which was the FDA pivotal trial reporting significant weight loss compared to diet and exercise alone. Here we report our early experiences and weight loss outcomes with the intra-gastric dual balloon as well as the impact of an online patient portal for compliance and data gathering.

Methods: 50 patients underwent intra-gastric dual balloon placement between September 2015 and March 2016 at four MBSAQIP accredited programs. All patients had a BMI \geq 30 kg/m² with 80% having \geq 1 comorbidity. The ReShape™ intra-gastric balloon was inserted endoscopically and subsequently filled with sterile saline and methylene blue solution, 750-900 cc. All patients received prophylactic anti-nausea medication. Balloons were scheduled to be removed endoscopically at six months following initial placement. Anthropometric data including patient weight, BMI, and percentage of excess weight loss (%EWL) were recorded before placement and monthly up to 6 months post-endoscopy. Implanted patients underwent monthly diet and exercise counseling, and entry onto an online patient portal that included automated wireless activity and weight monitoring. After insertion, patients visited the portal for data entry, treatment information and social media interaction with other patients. In addition, 10% of patients also received weight loss medications.

Results: Of fifty (50) patients, the following demographics are demonstrated: 80% female, mean baseline weight of 229.7+-40 lbs. and a mean baseline 37.1+-5.6 (range 28.5-56.2), 52.8 years old, 80% female, and 89.0% Caucasian. Average time for balloon placement was 21.7 \pm 2.3 minutes; all placements were performed as outpatient procedures. All insertion attempts were successful with no complications. Early retrievals (<4 months post-implant) occurred in 2 patients for prolonged nausea/pain and social concerns (loss of son). Post implantation, no complications were noted. Of note, there were (0%) deflations or ulcers noted at retrievals. Weight loss exceeds FDA trial results and is 30%EWL by Month 3. The following are weight loss results by month, % EWL, Standard Deviation (SD), Number of Patients (N): Month 1, 20.6% EWL, 10.6% SD, N=50; Month 2, 26.3% EWL, 17% SD, 41; Month 3, 29.9 %EWL, 21.4% SD, N=32; Month 4, 38.9%EWL, 24.7 SD, N=18; Month 5, 32.6 %EWL, 19.1, N=5; Month 6, 33.2%EWL, 24.2% SD, N=4. The mean number of portal visits to enter weight values per treatment month was 14.4+-9.3 (range 2 - 39). A subset of patients were regular users of portal social media. In a multivariable analysis, the number of times a patient utilized the portal to enter a weight value was positively associated (p=0.001) with the amount of weight lost.

Conclusion: Our study finds consistent weight loss using the dual intra-gastric balloon with no significant complications. This confirms previous findings that

the dual intragastric balloon is a safe and effective treatment for obesity and this early, post-FDA approval experience indicates better weight loss than seen in FDA pivotal trial. Of note, there is significant variation in weight loss and practice patterns with an opportunity for standardization. The availability of an online patient portal for data gathering and patient support may be an important adjunctive therapy for endoscopic obesity treatments in which compliance and long-term behavioral modification are important. Longer-term follow-up and additional patient experience will be necessary to determine the optimal patient population and weight loss.

A142

The effect of close postoperative follow-up on comorbidity improvement after bariatric surgery

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Introduction: Patients undergoing bariatric surgery require follow-up for efficacy assessment, early detection of postoperative complications, and also for management of comorbid conditions. Recent literature shows support for improved long-term weight loss with close and continued patient follow-up. However, attrition rates after bariatric surgery have been reported as high as 50%. The objective of this study was to assess the relationship between complete follow-up and improvement or remission of comorbid conditions at 12-months after surgery.

Methods: Using the Bariatric Outcomes Longitudinal Database (BOLD) dataset, patients with 12-month follow-up after bariatric surgery were identified. Patients that attended their 3, 6, and 12 month visits (complete follow-up) were compared to patients who had missed either or both of their 3 and 6 visits (incomplete follow-up). Improvement and remission of comorbid conditions were compared between the two cohorts. Specifically, changes in diabetes (T2D), hypertension, and dyslipidemia were evaluated at 12-month postoperatively.

Results: There were 38,613 patients (75.6%) with complete 12-month follow-up, compared to 12,468 (24.4%) patients who had incomplete follow-up. The presence of comorbid diseases was common in this

cohort preoperatively: T2D in 39.3%, hypertension in 62.0%, and dyslipidemia in 45.7%. Comorbidity improvement and resolution for each group are shown in Figures 1 and 2 ($p < 0.05$ for all comparisons in the figures). Of the 30,920 patients with hypertension at baseline, 13,953 (45.1%) and 19,157 (62%) had remission and improvement, respectively, at 12-months. Improvement in T2D and dyslipidemia was noted in 14,376 (73.3%) and 12,365 (54.1%) of patients, respectively, while 12,003 (61.2%) and 9,696 (42.4%) had T2D and dyslipidemia remission, respectively. After adjusting for baseline characteristics, complete postoperative follow-up in the first year after surgery was independently associated with a higher rate of improvement or remission of comorbid conditions (Table 1).

Conclusion: Adherence to postoperative follow-up resulted in a higher rate of comorbidity improvement and remission compared to incomplete postoperative care. Practitioners and patients should strive to achieve complete and long-term follow-up after bariatric surgery. Risk factors and screening for non-adherence in addition to the development of retention strategies may be of use for decreasing attrition rates postoperatively and improving long-term outcomes for bariatric patients.

A143

Outcomes of Bariatric Surgery in Patients on Chronic Anti-coagulation Medication

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Introduction: Perioperative management of chronically anti-coagulated patients undergoing bariatric surgery poses a significant challenge and requires a balance of managing hemorrhagic and thromboembolic risks. The aim of this study is to evaluate the incidence of hemorrhagic complications and their management in chronically anti-coagulated patients undergoing bariatric surgery at our institution.

Methods: After IRB approval, retrospective review of chronically anti-coagulated patients undergoing bariatric surgery from 2008 to 2015 was performed. Data collected included baseline demographics, co-

morbidities, Charlson comorbidity index, perioperative parameters, anticoagulant details, and postoperative outcomes. Data was summarized as medians for continuous variables and as counts with percentages for categorical variables.

Results: A total of 168 patients on chronic anticoagulation underwent surgery during the study period and had complete details available in the medical record. 93 (55.4%) patients were females; median age was 57 years and median BMI was 49.1 kg/m² (IQR 42.6-56.0). Preoperative comorbidities included hypertension (n=141, 83.9%), diabetes (n=96, 57.1%), hyperlipidemia (n=118, 70.2%), obstructive sleep apnea (n=133, 79.2%) and reflux disease (n=73, 43.5%). Indications for chronic anticoagulation were atrial fibrillation (n=91), history of pulmonary embolism (n=69), history of deep vein thrombosis (n=79), prosthetic heart valve (n=4), coagulation disorder including factor V Leiden deficiency (n=8), protein C deficiency (n=6), protein S deficiency (n=4), anti-phospholipid syndrome (n=2), prothrombin gene mutation (n=1) and immune thrombocytopenic purpura (n=1). Median Charlson comorbidity index was 2 (IQR 1-3), and 3 (IQR 2-5) when adjusted for age. Median preoperative hemoglobin and INR were 13.5 mg/dl (IQR 12.2-14.5) and 1.3 (IQR 1.1-2.0) respectively. Bariatric procedures performed included Roux-en-y gastric bypass (n=91, 54.2%), sleeve gastrectomy (n=64, 38.1%) and adjustable gastric banding (n=13, 7.7%). Median duration of procedure and estimated intraoperative blood loss was 158.5 minutes (IQR 120-183.3) and 50 ml (IQR 25-75) respectively. Significant intraoperative bleeding was reported in 1 patient. The median postoperative length of stay was 4 days (IQR 3-6). Duration of discontinuation of therapeutic anticoagulation before index surgery was 5 days (IQR 5-7) and it was resumed a median of 2 days postoperatively (IQR 1-3). 164/168 patients were bridged with either low molecular weight heparin (n=80), unfractionated heparin (n=12) or both (n=72) in the perioperative period. Early major postoperative complications (<30 days) were reported in 31 (18.4%) patients including postoperative bleeding (n=24), anastomotic leak (n=5), venous thromboembolism (VTE) (n=1), acute kidney injury (n=1) and reoperation (n=13). Indications for reoperation included postoperative bleeding (n=7), anastomotic leak (n=4), bowel obstruction (n=1) and acute cholecystitis (n=1). 17/24 patients with postoperative bleeding were managed with transfusion of blood products. All-cause readmissions within 30 days of surgery

occurred in 32 (19%) patients. Indications for readmissions included postoperative bleeding (n=9), reoperation (n=8), dehydration requiring intravenous fluids (n=5), marginal ulcer diagnosed on endoscopy (n=3), abdominal pain (n=2), anastomotic stricture (n=2), heart failure (n=2), urinary tract infection (n=1) and VTE (n=1). There was no 30 day mortality.

Conclusion: In our experience, patients who require chronic anticoagulation medication are at higher than average risk for postoperative complications including bleeding, leaks and the need for reoperation. Additionally, all-cause readmission rates for these patients are much higher than the 5% national average (19%). Careful surgical technique and close attention to postoperative anticoagulation protocols is required to decrease risk. These patients are at high risk for readmission and targeting them for additional resources after discharge to prevent readmissions may be warranted. **Keywords:** Bariatric surgery, anticoagulation, postoperative bleeding, roux-en-y gastric bypass

A144

Are there Gender Disparities in Cardiac Outcomes Following Bariatric Surgery?

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Background: Obesity is a major and modifiable risk factor for heart disease, the leading cause of death in the United States for both men and women. Despite mounting evidence that cardiovascular disease has gender differences and the majority of bariatric surgery patients are female, there has not been sufficient research on the gender differential effects of bariatric surgery in improving cardiovascular health. We hypothesize that there is a gender disparity in cardiac outcomes for patients undergoing bariatric surgery.

Methods: 1,989 patients who underwent laparoscopic Roux-en-Y gastric bypass (LRYGB) or laparoscopic sleeve gastrectomy (LSG) at the Stanford BMI Clinic were included in this study. Subjects were divided into two cohorts based on gender. Biochemical cardiac risk factors (BCRFs), including hemoglobin A1c, total cholesterol, HDL, LDL, triglycerides, C-reactive protein (CRP), lipoprotein(a), homocysteine, and BNP, were

collected preoperatively and at 12 months following surgery. Framingham Risk Scores for developing cardiovascular disease within 10 years were also calculated at these time points. All data were analyzed using GraphPad Prism v6.01.

Results: Significant differences were found between genders for the following BCRFs preoperatively: hemoglobin A1c (men: 6.9%, women: 6.2%; $p < .0001$), HDL (men: 39.7 mg/dL, women: 47.6 mg/dL; $p < .0001$), triglycerides (men: 181.4 mg/dL, women: 142.4 mg/dL; $p < .0001$), homocysteine (men: 11.2 $\mu\text{mol/L}$, women: 9.5 $\mu\text{mol/L}$; $p < .0001$), total cholesterol (men: 173.9 mg/dL, women: 184.3 mg/dL; $p = .0004$), LDL (men: 102.2 mg/dL, women: 111.6 mg/dL; $p = .0239$), and CRP (men: 8.4 mg/L, women: 10.3 mg/L; $p = .0230$). Of these, only HDL (men: 49.6 mg/dL, women: 57.0 mg/dL; $p < .0001$), homocysteine (men: 10.3 $\mu\text{mol/L}$, women: 8.6 $\mu\text{mol/L}$; $p < .0001$), and total cholesterol (men: 160.2 mg/dL, women: 168.0 mg/dL; $p = .0045$) remained significantly different at 12 months after surgery. Significant differences were found between genders for the percent of patients with abnormal values for the following BCRFs pre-operatively: hemoglobin A1C (men: 43.0%, women: 24.3%; $p < .0001$), HDL (men: 54.9%, women: 26.4%; $p < .0001$), triglycerides (men: 44.0%, women: 34.3%; $p < .0088$), homocysteine (men: 17.0%, women: 7.2%; $p < .0001$), total cholesterol (men: 24.2%, women: 31.3%; $p < .00438$), and LDL (men: 20.1%, women: 28.0%; $p < .0239$). Of these, only HDL (men: 21.8%, women: 10.1%; $p < .0001$) remained significantly different between genders at 12 months after surgery. Average Framingham Risk Scores remained significantly different between genders prior to surgery (men: 17.4%, women: 8.6%, $p < .0001$) and one year after surgery (men: 11.2%, women: 5.1%; $p < .0001$). Both men and women showed significant reductions in their 10-year cardiovascular disease risk, as assessed by the Framingham Risk Score, at one year after surgery (men: 35.6% decrease, women: 41.0% decrease; all $p < .0001$).

Conclusion: This study finds notable improvements in reductions in 10-year risk of developing cardiovascular disease for both genders undergoing bariatric surgery, with women demonstrating significantly lower Framingham Risk Scores compared to men post-surgery. It also demonstrates significant differences between men and women for measured BCRFs pre- and post-operatively. Notably, women had significantly higher CRP levels than men pre-operatively, but these differences were no

longer significant one year after surgery. Furthermore, HDL levels were significantly more abnormal in men compared to women even one year after surgery. These results suggest that women may have an enhanced mechanism of response to bariatric surgery, which leads to greater normalization of BCRFs and potential lower risk of developing heart disease, as compared to men.

A145

The Benefits of Bariatric Surgery Prior to Elective Total Joint Arthroplasty: Is There a Role for Weight Loss Optimization?

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Background: The association between obesity and osteoarthritis is well-established, as is the increased risk of postoperative complications after total knee arthroplasty (TKA) and total hip arthroplasty (THA) among patients with obesity. The role of bariatric surgery among patients requiring TKA/THA is not well understood. It is possible that bariatric surgery and subsequent weight loss may result in fewer complications, including wound infections, reduced operative times, and improved physical functioning after TKA/THA. The objective of this study was to evaluate the outcomes after TKA/THA based on whether they were performed before or after bariatric surgery.

Methods: A retrospective review of the medical records of all patients who underwent bariatric surgery from 2001-2014 was completed. Patients who underwent TKA/THA before their bariatric procedure were compared to those who had their TKA/THA performed after bariatric surgery and subsequent weight loss. Statistical analysis included chi-square test, and *t* tests. A *P* value $< .05$ was considered significant.

Results: There were 102 patients who had undergone bariatric surgery and TKA/THA; 36 had undergone TKA/THA prior to their bariatric procedure, and 66 underwent TKA/THA after their bariatric procedure. Joint arthroplasties was performed at a mean of 4.9 \pm 3.2 years before bariatric surgery and 4.3 \pm 3.3 years after bariatric surgery. The majority of patients in both groups were female (77% in those having TKA/THA after bariatric surgery vs. 86% in those having TKA/THA

before bariatric surgery; $P=0.280$). BMIs for those undergoing TKA/THA after bariatric surgery were significantly lower than those who had TKA/THA before bariatric surgery (Table). Operative time and LOS was significantly decreased for TKA/THA performed after bariatric surgery (Table). Early complications and late re-interventions were similar between the two groups.

Conclusions: Decreased operative time and length of stay were observed among patients who underwent TKA/THA after their bariatric surgery compared to those who underwent TKA/THA before their bariatric procedure. Patients who underwent TKA/THA after bariatric surgery had lower BMIs before and at 1 year after TKA/THA. Postoperative complication rates were similar between the two groups. The benefits of bariatric surgery and subsequent weight loss should be considered among patients with obesity requiring TKA/THA. The optimal timing of TKA/THA and bariatric surgery has yet to be established.

A146

Evaluating Organizational Factors Associated with Postoperative Bariatric Surgery Readmissions: Do Emergency Department Characteristics, Complication Rates, and Compliance with Best Practices Affect Readmission Rates?

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Introduction: As the mortality rate of bariatric surgery has improved, there has recently been increased emphasis on reducing preventable morbidity following these operations. Readmissions have emerged as a quality metric encompassing many aspects of postoperative morbidity and deficiencies in the transition from inpatient to outpatient care. While several patient and operative factors have been identified as risk factors for readmission, there is a paucity of information on how organizational factors influence this metric. In this study, we evaluated how readmissions are affected by institutional characteristics including compliance with best practices to reduce unplanned hospital visits, major complication rates, and the Emergency Department-sourced readmission (EDSR)

rate. The EDSR rate is defined as the percentage of bariatric patients who are readmitted out of all those who present to the Emergency Department (ED).

Methods: The Michigan Bariatric Surgery Collaborative (MBSC) database was used to identify patients undergoing all primary bariatric procedures at 40 centers with >100 patients in the database from 2006-2015. Using an indirect standardization process, each sites' observed to expected ratio for 30-day readmission was calculated adjusting for age, sex, operation type and approach, insurance, total comorbidities, BMI, initial length of stay, procedure year, and hospital size. A survey assessing compliance with recommended ASMBS best practices of the Decreasing Readmissions through Opportunities Provided (DROP) program was completed at each site. The association between each site's adjusted readmission rate and their rate of ED visits, EDSR, major complications, and compliance with best practices were calculated with Pearson's correlation coefficients.

Results: There was significant variation among sites' adjusted rates of readmission, EDSR, best practice compliance rates, and major complication rates (Figure 1). There was a moderately strong association between each sites' adjusted readmission rate and their rate of EDSR ($r=0.53$), major complications ($r=0.53$), and ED visits ($r=0.55$). However, the association between bariatric centers' compliance with best practices to reduce unplanned hospital visits and their readmission rates was fairly weak ($r= -0.14$).

Conclusion: Bariatric centers with higher rates of major complications and sites with Emergency Departments that are less likely to treat and discharge patients are more likely to have higher readmission rates. While compliance with best practices to reduce readmissions may be important, it's likely that it does not significantly influence the readmission rates at sites that perform only these basic measures or perform them inadequately. Further examination of organizational characteristics of bariatric programs that affect postoperative readmissions, including Emergency Department practices, is needed to better guide future initiatives aimed at improving this quality metric.

A147

Insurance-mandated pre-operative diet and outcomes following bariatric surgery

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Background: Obesity and obesity-related comorbidities represent significant health and socioeconomic burdens. Bariatric surgery remains the most effective treatment modality, yet many insurance carriers mandate a strict pre-operative diet program prior to approving coverage of this treatment. The ASMBS has advocated against this requirement as no class I data demonstrates improved weight loss outcomes, and mandatory diets lead to increased rates of attrition from bariatric programs. The purpose of our study was to compare outcomes between patients with and without an insurance-mandated pre-operative diet program.

Methods: All patients who underwent laparoscopic Roux-en-y gastric bypass or laparoscopic sleeve gastrectomy at a single institution from January 2009 through December 2013 were retrospectively analyzed from a prospectively maintained database. The patients were stratified into those with insurance requiring a physician-guided diet program prior to bariatric surgery and those without such a requirement. Pre-operative characteristics including demographics, comorbidities, and socioeconomic status were evaluated. Weight and BMI were collected from initial and immediate pre-op clinic visits, and percent weight loss (%WL) was determined at 6, 12, and 24 months. Linear mixed models were used to examine differences in post-operative %WL at these time points, and generalized linear models analyzed %WL for all clinic visits during this time period. Covariates were determined using backwards stepwise selection.

Results: A total of 284 patients met inclusion criteria for the study, of whom 225 (79.2%) were required and 59 (20.8%) were not required by insurance providers to participate in a pre-operative physician-guided diet. Those who were not required to undergo a pre-operative diet had a shorter time to operation from the initial clinic visit (154 versus 218 days; $p=0.04$), were older at time of operation (median age 51 versus 43 years; $p<0.01$), and more likely to have government-sponsored insurance (84.8% versus 4%; $p<0.01$). The groups were not significantly different in initial or immediate pre-operative weight or BMI, obesity-related comorbidities, socioeconomic status, or type of bariatric operation performed. In unadjusted

models, there were no significant differences in %WL at 6, 12, or 24 months following bariatric surgery based on an insurance-mandated diet, although there was a trend towards greater %WL for patients not required to participate in a pre-operative diet at 24 months. In adjusted models, there was a greater %WL at 24 months in patients for whom a pre-operative diet was not required (33% versus 25%, respectively; $p<0.01$). When accounting for all bariatric clinic visits during this time period, unadjusted and adjusted generalized linear models showed no significant difference in %WL ($p=0.69$ and $p=0.43$, respectively). Finally, no difference in complication rates between the two groups was observed.

Conclusions: There was no difference in weight loss outcomes or complication rates for patients based on whether they were required to participate in a pre-operative diet by their insurance carrier. However, there was a significant delay in time to operation for those required to participate in an insurance-mandated diet. Our results support that insurance-mandated pre-operative diets do not improve outcomes following bariatric surgery. Rather, they may delay time to operation and, therefore, the treatment of obesity and its associated comorbidities.

A148

Association of the FTO gene with suboptimal weight loss following bariatric surgery

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Background: Traditional treatments for obesity have poor long-term outcomes. Currently, the most successful method of sustained weight loss is bariatric surgery. Despite the indisputable effectiveness of bariatric surgery, there remains significant inter-individual variability in the treatment response. The mechanisms by which these bariatric procedures lead to successful weight loss are only partially understood and are thought to include biological mechanisms that are subject to genetic variation. The aim of our study was to identify genetic predictors that may explain variation in weight loss efficacy following bariatric surgery.

Methods: This is a retrospective cohort study conducted at an academic bariatric center from 2009 to 2014. We recruited 135 bariatric surgical patients who had undergone Roux-en-Y gastric bypass (GBP) at least two years prior. Blood samples were collected from each patient. DNA was genotyped by pyrosequencing, providing basepair resolution of the single nucleotide polymorphisms (SNPs) assayed. We examined SNPs in *DRD2*, *PPARG*, *MC4R*, and *FTO* genes. Multiple logistic regression was performed using an additive model that included preoperative weight, sex, race, and ethnicity as covariates.

Results: One hundred thirty-five patients were analyzed, of whom 21 were male and 114 were

female. The majority of the population was Caucasian (71.9%). Of the 135 patient samples, 20 were found to have suboptimal weight loss, defined as 40% excess weight loss (EWL<40). A significant association (P=0.028) was observed with rs9939609 within the *FTO* gene. This SNP has been previously associated with fat mass and obesity in GWAS studies and diminished satiety.

Conclusions: Our data suggest that genetic variations associated with obesity may also play a role in suboptimal bariatric weight loss. Additional samples are needed to replicate the current finding and to examine other obesity and diabetes-related GWAS SNPs.

Video Session A

Thursday November 3rd, 2016 8:00am – 9:30am

A149

Laparoscopic Transhiatal Esophagectomy after Biliopancreatic Diversion with Duodenal Switch

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As rates of obesity continue to rise, bariatric surgery remains an effective and frequent strategy. The relationship between obesity and development of upper gastrointestinal malignancies has been described. Increasing rates of sleeve gastrectomy present a technical challenge to using a gastric conduit. We present a video case presentation of a novel surgical technique of laparoscopic transhiatal esophagectomy with a gastric conduit in a patient after previous duodenal switch for weight loss. We present a 61 year old male who had previously undergone laparoscopic biliopancreatic diversion with duodenal switch operation for morbid obesity 4 years prior. He now presents with a new diagnosis of an early stage distal esophageal adenocarcinoma identified on surveillance for Barrett's esophagitis. A traditional transhiatal esophagectomy with gastric conduit was thought to be impossible as the blood supply for the conduit would have been compromised with the sleeve gastrectomy component of the duodenal switch. The patient was brought to the operating room by the bariatric surgery and surgical oncology services. The stomach was evaluated and after clamping the left gastric artery, it was found that the conduit remained viable and would have adequate blood supply. Minimally invasive transhiatal esophagectomy was performed

with reversal of the duodenal switch. The patient's post-operative course was complicated by a chyle leak, but this was easily managed with a low fat diet and did not require additional intervention. He also had a cervical anastomotic stricture at two months post resection which is resolving with serial dilations. With the rising rates of obesity worldwide; we will undoubtedly continue to see development of upper gastrointestinal malignancies in patients with previous bariatric surgery. The altered anatomy, particularly after sleeve gastrectomy and biliopancreatic diversion with duodenal switch, poses specific challenges when considering reconstruction after esophageal resection. This is the first reported case of esophagectomy after duodenal switch or sleeve gastrectomy. We demonstrate that minimally invasive techniques are feasible and that a traditional gastric conduit remains a viable option.

A150

Laparoscopic Whipple in Roux en Y Gastric bypass anatomy

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Laparoscopic pancreatic surgery is one of the most advanced techniques in minimal invasive surgery. First laparoscopic Whipple's procedure was done in 1994. With increasing obesity even though number of bariatric surgeons are not increasing but prevalence is high. This video demonstrates laparoscopic Whipple in patient with previous Roux-en-y gastric bypass. This video will focus on identifying anatomy, dissection, resection of

remnant stomach and suturing technique for Whipple's procedure. 43 years/Female with history of Roux-en-Y gastric bypass 11 yrs ago with current BMI 28 was having chronic back pain. During workup for that by MRI of back showed incidental pancreatic head mass measuring about 4*5 cms with feature of neuroendocrine tumor. She had no functional neuroendocrine symptoms. Since the size and location of this tumor it was decided to proceed with laparoscopic Whipple. Remnant gastrectomy was performed and biliopancreatic limb was brought through infracolic mesenteric space to create pancreaticojejunostomy and choledochojejunostomy. Original pouch and Roux limb of 100 cms was preserved. Estimated blood loss was less than 50 cc and duration of surgery was 3.5 hours.

A151

LAPAROSCOPIC ROUX-EN-Y FISTULO-JEJUNOSTOMY FOR TREATMENT OF A PERSISTENT LEAK FOLLOWING SLEEVE GASTRECTOMY

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Introduction: 16-year-old female with history of laparoscopic sleeve gastrectomy in Mexico 4 months prior was transferred to our facility for overwhelming sepsis secondary to a leak. She was taken for laparoscopic lysis of adhesions, drainage of intraabdominal abscess, and endoluminal stent placement at the time of presentation. She improved clinically, however, she continued to have persistent leak and was ultimately taken for revision procedure.

Materials and Methods: The gastric pouch was dissected free from the left lobe of the liver all the way to the phrenoesophageal ligament. The leak was then identified; it was larger than expected and located on the lateral edge at the level of the GE junction. Due to her young age, a formal esophagojejunostomy was avoided and ultimately a Roux limb of jejunum was brought up to do a side-to-side anastomosis to the opening leak area. The small bowel was transected 50 cm from the ligament of Treitz. A jejunojejunostomy was created and mesenteric defect closed. The Roux limb was brought up to the area of leak and an fistulojejunostomy was created with an Edlich tube in place.

Result: Postoperatively the patient did fairly well. UGI was negative for leak on POD#5. The patient was discharged home on POD#8 on tube feeds. She was seen in the outpatient clinic and with repeat CT scan completed, which also demonstrated resolution of leak.

Conclusion: Creation of Roux-en-Y esophagojejunostomy is a feasible option for a proximal gastric leak.

A152

Laparoscopic repair of a recurrent GastroGastric fistula after failed Transgastric closure of fistula.

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Medical University of South Carolina¹

The patient is a 60 y/o white male who had a retro colic retro gastric roux en y gastric bypass 4 years ago, patient had lost 100 pounds and had resolution of comorbidities. He subsequently had severe GERD and loss of satiety. Further workup by endoscopy and UGI revealed a GG fistula. A Transgastric method was utilized for GG fistula closure. The endoscope was used to intubate the excluded stomach through the GG fistula and two balloon fixation ports were placed by trans illumination through the abdominal wall into the excluded stomach without laparoscopic access. The endoscope was withdrawn and the GG fistula was closed using a suture in 2 layers. We have performed 5 of these and 3 of them were performed using Transgastric method and 2 others were performed using the endoscopic suturing system. All of these over a period of 12- 24 months have recurred and have required subsequent laparoscopic revision. As was seen in this patient most of them had gj strictures, which were aggressively dilated at the time of fistula closure, however they all recurred. Immediately postoperatively they seem to have good results by imaging and symptomatically, however over time their symptoms recur and when investigated they have recurrent fistulas. Based on this series we have concluded that in our hands Transgastric or endoscopic closure of Gastro gastric fistulas have poor long term results and we have been performing laparoscopic take down of the fistula with revision of the GJ when indicated.

A153

Gastric bypass conversion to Duodenal Switch

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Introduction: Weight regain after bariatric surgery presents as a complicated problem. Patient are seeking revisions to maintain their gains regarding amelioration of co-morbidities and weight stability. Thorough investigations, including nutrition, psychological evaluation and anatomy review are mandatory prior to surgical revision due to increased morbidity and mortality profile. Several options are offered to patients including minor revisions, reversal and conversions of primary procedures. In this video we present a laparoscopic conversion of a gastric bypass (RYGB) to a duodenal switch (DS). Patient and Methods The patient is a 38-year-old woman who underwent a RYGB in early 2011. Her preoperative weight was 414 lbs representing a BMI of 61. The patient was able to achieve a post surgical weight of 273 lbs sustained for about 2 years. Due to the addition of steroids and gabapentin to treat other comorbidities she slowly regained her weight back. After appropriate nutrition and psychologic evaluations the patient underwent preoperative workup. An UGI study was normal. An upper endoscopy revealed a 4x5 cm pouch with no evidence of gastro-gastric fistula. We recommended conversion of RYGB to DS due to increasing weight impairing patient's mobility, exacerbating her arthritis and decreasing her quality of life.

Procedures: The procedure was completed laparoscopically using 4 ports (two 5 mm, one 12 mm and one 15 mm) and a liver retractor. Upon general exploration, and antecolic antegastric bypass was found. The anatomy was delineated and lysis of adhesions performed in order to identify the gastric pouch, roux limb, gastric remnant and pylorus. The gastrojejunaa (GJ) anastomosis was identified endoscopically and laparoscopically in preparation for transection. Using an endoscopic stapler with a black load the stomach proximal to the anastomosis was divided. A gastrostomy was created in the posterior aspect of the newly created pouch under direct endoscopic visualization. We turned our attention to performing the gastric resection. The lesser sac was opened and the omental attachments taken with energy device towards the angle of his. The short gastric vessels were

controlled with energy device. A gastrostomy was made on the remnant stomach adjacent to the pouch gastrostomy and a gastrogastrostomy was created using a purple load of the endoscopic stapler. The common gastric defect was approximated with 2-0 Polysorb suture completing the reversal of the gastric bypass. The stomach was transected sequentially using multiple endoscopic staplers with black loads forming a modified gastric sleeve with fundus predominance in order to preserve the distal stomach blood supply and the reversal anastomosis. The greater curvature of the remnant stomach was completely separated and placed in an endocatch bag. 300 cm proximal to the ileocecal valve, were marked in order to maintain proper orientation and tacked temporarily to peritoneal tissues adjacent to the duodenum. The duodenal dissection started by creating a tunnel distal to the pylorus underneath the first portion of the duodenum and an endoscopic stapler with a tan curve load was placed and the duodenum divided. The marked small bowel was anastomosed to the duodenum using 2 layer hand sewn anastomosis. An air leak test was performed. The detached GJ complex and part of the roux limb were transected using a single endoscopic tan load. The specimen was placed in an additional endocatch bag. The specimens were extracted. The procedure was performed in 232 minutes. EBL was 50 cc. There no complications. Total length of stay was 6 days. **Conclusion** In this video we demonstrated a conversion of a RYGB to DS for weight regain. Revisions procedures increase the complication profile and require a thorough multidisciplinary pre operative work up. Laparoscopic approach is safe and feasible in all revisions. Revisional bariatric surgery should be completed in a referral centers.

A154

Laparoscopic Roux-en-Y gastric bypass (LRYGB) after Loop gastric bypass and gastro-gastric fistula and reversed jejunoileal bypass

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Cleveland Clinic of FL¹ Cleveland clinic florida²

Introduction: Limited information is available regarding LRYGB after gastroplasty Loop gastric bypass and gastro-gastric fistula and reversed jejunoileal bypass. This type of conversion is

technically challenging. The study objective is to explain the steps that are required to convert Loop gastric bypass and gastro-gastric fistula into Roux-en-Y gastric bypass.

Methods: We present a case of a 61 year old female, BMI of 53.26 kg/m², who presented with failure of weight loss and weight regain after undergoing Loop gastric bypass in an outside institution as well as a previous jejunoileal bypass that had to be reversed. The patient suffered from weight regain and intractable gastro esophageal re evidence of gastro gastric fistula, requiring conversion to LRYGB. After the abdominal cavity was accessed large amounts of adhesions between omentum, small bowel, the stomach to the laparotomy wound were taken down. The greater curvature side of the stomach was dissected. Dissection was carried out to the left and right crus of the diaphragms. A hiatal hernia was noticed and reduced. With the guidance of a 32 Fr orogastric tube the proximal stomach was divided to create a pouch of approximately 15 cc. The hiatal hernia was closed with a running 2-0 Prolene Quill suture. A Roux limb was created approximately 50 cm distal from the ligament of Treitz after running the small bowel from the ligament of Treitz to the ileocecal valve. The Roux limb was brought in antecolic fashion and without tension, and a side-to-side gastrojejunostomy was performed with a linear stapler and the anterior wall with double layer of running 2-0 Vicryl sutures. A side-to-side jejunojunctionostomy was then done with several applications of linear stapler.

Results: The patient tolerated the procedure well with minimal blood loss. An upper GI Gastrografin showed no evidence of leak or obstruction. The patient was discharged home on post-operative day 4.

Conclusion: LRYGB after Loop gastric bypass and gastro-gastric fistula and reversed jejunoileal bypass, although technically challenging, can be done to treat morbidly obese patients with weight regain, after Loop gastric bypass and gastro-gastric fistula and reversed jejunoileal bypass.

A155

A Novel Approach To Reflux After Bariatric Surgery
Amir Aryaie¹, Leena Khaitan *Cleveland Ohio*²
Texas Tech University School of Medicine¹ University Hospitals Case Medical Center²

This is a video presentation on using magnetic ring device for reflux management after sleeve gastrectomy and gastric bypass. Both patients had

excellent outcome with resolution of their reflux post operatively.

A156

Omega Loop Duodenal Switch with Linear Stapled Duodenoileostomy Peter C Ng, MD, Lindsey S. Sharp, MD, and Dustin M Bermudez, MD
Peter Ng *Raleigh NC*¹, Lindsey Sharp *Raleigh NC*², Dustin Bermudez *Raleigh NC*²
Rex Bariatric Specialist¹ UNC Rex Hospital²

Malabsorptive procedures such as duodenal switch (DS) continue to gain acceptance and relevance in the management of obesity and metabolic disorders. As we work to improve our understanding and broaden adoption, we also endeavor to develop greater technical efficiency, reliability, and safety. Current techniques reported for duodenoileal anastomosis include hand sewn end to end, robotic hand sewn, circular stapled, and linear stapled. The vast majority of DS surgeons hand sew these duodenal anastomosis. Yet, this technique carries certain limitations and challenges. Hand sewn DI anastomoses require a high skill set with a steep learning curve. This produces potential for inconsistency in anastomotic quality, operative times, leaks, and stricture. Adopting stapled techniques may allow for more consistent results, and may further, make DS more approachable for bariatric surgeons. Our video describes a linear stapled technique for the duodenoileostomy, applicable to both standard duodenal switch and single anastomosis duodenal switch. In addition, we demonstrate the Omega loop technique from construction of the DS. This approach demonstrates DS in an organized, efficient, and reproducible technique.

A157

INTRA-THORACIC MIGRATION OF SLEEVE GASTRECTOMY

Ali Mouzannar *Adan Mubarak Al-Kabeer*¹, Aqeel Ashraf *Kuwait Kuwait*, Mousa Khourshed *Kuwait Kuwait*, Ibtisam Al-Bader *jabriyah kuwait*, Abdullah Al-Hadad, Abe Fingerhut *Graz styria*
Mubarak Al-Kabeer Hospital¹

The hiatus should be carefully inspected during laparoscopic sleeve gastrectomy. At long term, it maybe responsible for migration of the gastric pouch into the thorax. This video illustrates the case of 36 years old gentleman who underwent laparoscopic

sleeve gastrectomy for morbid obesity. After that, the patient developed dysphagia and reflux symptoms which resulted from migration of the gastric pouch into the thorax as evident by barium meal. The patient underwent laparoscopic reduction of the migrated stomach using sharp and blunt dissection methods and the hiatal hernia was repaired using non-absorbable sutures. After 3 months, the patient had persistent dysphagia which

was not responding to medical treatment. Thus, laparoscopic Roux-en-Y gastric bypass was performed. However, the patient had ischemic leak from the gastric pouch on postoperative day 7. He underwent emergency laparotomy: resection of the gangrenous pouch and esophageo-jejunostomy was performed. The patient was discharged on postoperative day 7, and was symptoms free 3 months postoperatively.

Video Session B

Thursday November 3rd, 3:45pm – 5:15pm

A158

Laparoscopic Stomach Intestinal Pylorus Sparing Surgery in Patient with Morbid Obesity and Situs Inversus; First Video Case Report

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Introduction: Stomach intestinal pylorus sparing surgery (SIPS) is one of the most effective weight loss procedures. Since 2013, we have successfully performed SIPS in more than 250 patients. However, performance of any weight loss operation can be complicated by any patient with mirror image transposition of the abdominal and thoracic organs known as situs inversus [SI]. SI is a rare autosomal recessive condition. SI is divided into two types: situs inversus partialis [SIP], which involves transposition (left or right side) through sagittal plane of either thoracic organs (dextrocardia) or abdominal viscera, and situs inversus totalis [SIT], which involves both the thoracic organs and abdominal viscera, while the organ function is normal. Our patient had SIT. Few articles have discussed the incidence of SI and the issue of performing weight loss surgery on these patients. None have reported laparoscopic SIPS in patients with morbid obesity and SI. We herein report a video case involving our laparoscopic SIPS technique in a patient with morbid obesity and SIT. This is the first report in the literature to describe laparoscopic SIPS in a patient with SI.

Case presentation: This is a 31-year-old female with a body mass index (BMI) of 52.5 kg/m² and asthma controlled with ongoing daily medication. The presence of SI was initially discovered during her

first weight loss operation. We discussed with the patient the risks and benefits of the procedure in a patient with SI and she agreed to proceed with a SIPS surgery.

Management: As the diagnosis of SI was known pre-operatively, the surgical team made pre-operative preparations which included changing the setup of the operating room. In this case the operating surgeon was on the patient's left side instead of the right. Additionally, trocar sizes and locations were inverted. Laparoscopic exploration showed complete transposition of abdominal viscera: The terminal ileum was located on the left side of the abdomen and 300 cm of small bowel was measured and tacked to the gastro-colic omentum. The SIPS creates a sleeve gastrectomy (SG) as the first step. Our sleeve uses a 40 French bougie. There was no over sewing or buttressing in the SIPS procedure. Once the sleeve was completed the gastroepiploic vessels were taken down from the end of the sleeve staple line past the pylorus to where the perforating vessels from the pancreas enter the duodenum. This was almost always 2 to 3 cm beyond the pylorus. A blunt instrument was passed behind the duodenum to create a passageway for the division of the duodenum. The duodenum was divided with an Endo GIA stapler (Medtronic). The anti-mesenteric border of the bowel at this point was attached to the end of the proximal duodenum staple line using an absorbable suture. The loop was set up so the efferent limb is descending on the patient's left, and the afferent limb is ascending coming up from the right. A duodenotomy and enterotomy were made that were approximately 2 cm. The enterotomy was closed with a running posterior layer and a running anterior layer. Another two interrupted sutures were placed one from the afferent limb to the antrum and the other from the afferent limb to the omentum to

prevent chronic nausea and volvulus. Operative time for this case was 90 mins. Blood loss was 50 ml and the postoperative course was uneventful and the patient was discharged on the second postoperative day. The patient is two and half month out of surgery, with no complaints and has lost 46 lbs. Schematic representation of SIPS in SI can be seen in Fig. 1.

Discussion: The SIPS is an emerging procedure and unusual complications with this procedure have been reported in the literature. Similarly, performing SIPS in patients with unusual anatomy should also be reported, so that it becomes easy for other surgeons to perform. Many people with SI are unaware of their unusual anatomy until they seek medical attention for an unrelated condition. Most of the time, such conditions are diagnosed pre-operatively and this gives an opportunity for the surgeon to plan their surgery to avoid intra-operative difficulties. In the early phase of the operation, it took us time to establish proper hand eye coordination but we adapted to the mirror image of the standard procedure during the operation. Duodenal dissection and transection is one of the most important and difficult steps, while performing a SIPS procedure. In patients with SI such steps can be carried out using the mirror image approach to all parts of the operation for a successful surgery. In this case the operating time was little higher than the time taken to perform SIPS in a normal people with obesity (90 mins vs 70 mins).

Conclusion: Laparoscopic SIPS surgery in patients with SIT can be performed safely.

A159

Laparoscopic Heller Myotomy After Previous Roux-en-Y Gastric Bypass

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Background: Achalasia is a rare primary esophageal motility disorder that is even more rare amongst the obese population. It is characterized by aperistalsis of the esophagus and lack of relaxation of the lower esophageal sphincter. Associated symptoms in the nonobese patient include dysphagia, regurgitation, reflux and weight loss. On the contrary, amongst the obese population regurgitation, cough and aspiration are the presenting symptoms.

Methods: 46-year-old female s/p laparoscopic Roux-en-Y gastric bypass in 2011 at an outside hospital presented with chronic cough and regurgitation. An

UGI swallow study, endoscopy and manometry revealed achalasia. The decision was made to proceed with laparoscopic Heller myotomy.

Results: Our video demonstrates a laparoscopic Heller myotomy after previous Roux-en-Y gastric bypass. The myotomy was carried out 6 cm onto the esophagus and 2 cm onto the stomach. An endoscope was used intraoperatively to ensure adequate length of the myotomy. The gastric remnant was then sutured anteriorly to both edges of the myotomy and bilateral crura. Postoperatively the patient did well, and an UGI was performed 1 week and 1 month postoperatively. Symptom resolution was achieved for the patient.

Conclusion: Achalasia is a very rare entity amongst the obese population. It is infrequently recognized in bariatric patients who present with atypical symptoms. Laparoscopic Heller myotomy is a safe option after previous Roux-en-Y gastric and can result in a successful outcome.

A160

Simultaneous Gastric and Colonic Band Erosion Presenting as Lower Gastrointestinal Bleeding and Abdominal Pain

Shadi Al-bahri *Tampa FL*¹, Christopher Tufts *Tampa FL*¹, John Paul Gonzalvo *Tampa FL*¹, Michel Murr *Tampa FL*¹ University of South Florida¹

We present a 63-year-old female with a history of lupus anticoagulant, recurrent deep vein thrombosis on coumadin, and a laparoscopic gastric adjustable band for morbid obesity. Her procedure was complicated by subcutaneous port erosion treated at the time with local port removal. The band and associated tubing were not removed due to lack of insurance approval and had since been lost to follow-up. She presented to our tertiary care facility with three days of bright red blood per rectum associated with mild peri-umbilical pain. A colonoscopy by the gastroenterologist found the free distal tip of the band tubing eroded into the transverse colon lumen. A computed tomography scan identified the band and tubing extending into the transverse colon without involvement of other organs. She required transfusions prior to surgical exploration. We proceeded with a plan to remove the band with repair of her gastric and colonic erosions. A Veress needle was used to induce pneumoperitoneum and the trocars were inserted in the usual fashion. Sharp adhesiolysis was performed to take down the scarred omentum surrounding the

tubing extending to the transverse colon. Very careful dissection was then performed around the tube erosion site, noted to be at the antimesenteric border of the transverse colon. Once cleared of all surrounding fat, the tube was removed and the colotomy closed using full thickness sutures. The tubing was followed proximally, entering the stomach at the anterior body of the stomach. This gastrotomy was also closed with interrupted sutures, and an upper endoscopy was performed. This visualized a partially eroded band anteriorly, but not posteriorly. As a result, the band could not be removed endoscopically. An extensive dissection was performed at the hiatus, which showed a 4 cm hiatal hernia which was closed posteriorly. An anterior transverse gastrotomy was made along the border of erosion, and the band was removed in 2 portions. The gastrotomy was closed in 2 layers creating an anterior fundoplication over a 56 Fr bougie to ensure a stricture is not created with this closure near the gastroesophageal junction. The patient tolerated the procedure well, and was started on liquids in the immediate postoperative period, and advanced to a regular diet within 48 hours upon return of bowel function. She was discharged home on postoperative day seven due to difficulties with pain control and ambulation. She was seen in clinic for her 3 week and 3 month followup visits, and is tolerating her diet. She developed a surgical site infection over one of her trocar incisions, but otherwise has not had any recurrent episodes of bleeding with resolution of her abdominal pain.

A161

Intragastric Balloon as a Rescue Procedure in Patients with Super-super Obesity

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Almulla *Kuwait Kuwait*¹, Jonathon Vaz *Dasman Kuwait*¹
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Background: Liver steatosis is a common complication of morbid obesity. So, such issues can increase chances of operative complications. We present a case of liver steatosis in a morbidly obese patient in which we faced difficulty in the first attempt of sleeve gastrectomy and a gastric balloon was inserted instead endoscopically as a rescue procedure for a later laparoscopic sleeve Gastrectomy (LSG).

Case Summary: A 36-year-old super super-obese female (BMI 70 kg/m² and weight 187 kg) with known hypertension, and obstructive sleep apnea on CPAP presented to our unit for sleeve gastrectomy. After a pre-operative assessment and counseling, LSG was decided. During the first attempt of surgery, the liver was fatty and enlarged and the operative field was unclear due to the high amount of visceral adipose tissue and so proceeding with surgery would have put the patient at severe risk of liver laceration and technical difficulty if the surgery had continued. A decision was made pre-operatively according to our protocol, to abort the LSG and to insert an intra-gastric balloon endoscopically for initial weight loss to aid in a future attempt of LSG procedure and consent of the patient was obtained. The intra-gastric balloon was inserted on the same setting during the procedure and patient was discharged in good condition. After 6 months, the patient had lost 38 Kilograms [32% EWL BMI 55 kg/m²] and came for removal of the intra-gastric balloon. The second attempt of surgery was scheduled two months after removal and was successful as the liver had reduced in size and the amount of fatty tissue in the area has majorly decreased as seen in the video. Our surgical procedure included a 5-trocar (2-12mm and 3-5 mm) technique using calibration tube size 36 starting 4 cm from the pylorus. 80% of the stomach has been removed utilizing green cartilage stapler. There were no intraoperative or postoperative complications encountered and the patient was discharged two days later in a good general condition. The patient is followed up by a dietician and with the surgical unit. In the patient's 3th month visit, she had lost 14 kg since surgery, and at 6 months, she lost 57 kg with a BMI of 44.9 and with a weight of 127.

Conclusion: Intragastric balloon is an effective and feasible rescue procedure when confronted with difficulty due to patient's factors during sleeve gastrectomy, reducing both liver size and visceral fat, as well as facilitating an easier, less complicated sleeve gastrectomy procedure.

A162

Reversal of Retrogastric Gastrojejunostomy with Gastrogastric fistula

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Background: Achalasia is a rare primary esophageal motility disorder that is even more rare amongst the obese population. It is characterized by aperistalsis of the esophagus and lack of relaxation of the lower esophageal sphincter. Associated symptoms in the nonobese patient include dysphagia, regurgitation, reflux and weight loss. On the contrary, amongst the obese population regurgitation, cough and aspiration are the presenting symptoms.

Methods: 46-year-old female s/p laparoscopic Roux-en-Y gastric bypass in 2011 at an outside hospital presented with chronic cough and regurgitation. An UGI swallow study, endoscopy and manometry revealed achalasia. The decision was made to proceed with laparoscopic Heller myotomy.

Results: Our video demonstrates a laparoscopic Heller myotomy after previous Roux-en-Y gastric bypass. The myotomy was carried out 6 cm onto the esophagus and 2 cm onto the stomach. An endoscope was used intraoperatively to ensure adequate length of the myotomy. The gastric remnant was then sutured anteriorly to both edges of the myotomy and bilateral crura. Postoperatively the patient did well, and an UGI was performed 1 week and 1 month postoperatively. Symptom resolution was achieved for the patient.

Conclusion: Achalasia is a very rare entity amongst the obese population. It is infrequently recognized in bariatric patients who present with atypical symptoms. Laparoscopic Heller myotomy is a safe option after previous Roux-en-Y gastric and can result in a successful outcome.

A163

Laparoscopic esophagojejunostomy for RYGB after leak from Sleeve Gastrectomy

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Cleveland clinic florida¹ Cleveland Clinic of FL²

Introduction: Gastric Sleeve Gastrectomy and RYGB have become frequent bariatric procedures. However frequently they are complicated by postoperative gastric leaks. There are several endoscopic approaches to treat this complication. In case of failure of the endoscopic treatment, a definitive surgical approach should be attempted. The study objective is to determine the feasibility and safety of esophagojejunostomy for RYGB after leak from Sleeve Gastrectomy

Methods: We present a case of a 48 year old female, BMI of 25.73 kg/m², with history of sleeve gastrectomy in 2013. Five months after the procedure she got a fistula. Multiples endoscopy treatments were attempted without success. In 2014 she got a gastric bypass but the fistula still remained active. After accessing the abdominal cavity, an extensive adhesiolysis was performed. Dissection was then carried out on the greater curvature side of the gastric pouch. Transverse colon and splenic flexure adhesions were taken down. The pancreas was completely adhered to the gastric pouch and the colon. With meticulous technique, using cold scissors, the stomach, the colon, and the pancreas were detached. The stomach was completely removed from attachments to the diaphragm and the fistulous tract was clearly identified. The pigtail drain was removed. Dissection was carried out to the left crus of the diaphragm. The esophagus was completely dissected in the lower mediastinum and the left crus of the diaphragm opened. The patient had a ligated donut type or omega loop type small bowel loop that was ending into alimentary limb that went into Roux-en-Y system. That Roux-en-Y system had 310 cm of biliopancreatic limb to the ligament of Treitz and 390 cm of common channel towards the ileocecal valve. After all this was completely identified, the whole complex of the small bowel with omega loop, the pouch, and the distal esophagus were transected.. The distal limb of small bowel was brought to the upper abdomen in an antecolic fashion and a side-to-side esophagojejunostomy was performed using linear stapler. The nasogastric tube was passed into the proximal jejunum. A side-to-side jejunojunctionostomy between the biliopancreatic and alimentary limbs were performed at 100 cm from the esophagojejunostomy. The common entry hole of jejunojunctionostomy site was then closed with several applications of linear stapler.

Results: The patient tolerated the procedure well with minimal blood loss. An upper GI Gastrografin showed no evidence of leak or obstruction. The patient was discharged home on post-operative day 7 on a full liquid diet.

Conclusion: Gastric leaks after bariatric procedures are relatively common event. Laparoscopic esophagojejunostomy for RYGB after leak from Sleeve gastrectomy is feasible, but it remains a challenging operation with higher potential morbidity.

A164

Laparoscopic conversion of herniated Sleeve Gastrectomy to RYGB

Raul Rosenthal *Weston FL*¹, Nisha Dhanabalsamy *weston Florida*², Rajmohan Rammohan², Lisandro Montorfano *Weston Florida*², Mandip Joshi *weston florida*², Emanuele Lo Menzo *Weston FL*², Samuel Szomstein *Weston FL*²
Cleveland Clinic of FL¹ Cleveland clinic florida²

Introduction: Although Laparoscopic Sleeve Gastrectomy is considered a safe operation for the morbidly obese, several surgical complications have been described. Although rare, this procedure can lead to hiatal hernias. Many patients with hiatal hernias are asymptomatic, but in some cases they can present with gastro esophageal reflux disease and/or dysphagia. The study objective is to show the operative technique practiced in our clinic for the conversion of herniated sleeve gastrectomy to RYGB

Methods: We present a case of a 52 year old male, BMI of 32.8 kg/m², who presented with a hiatal hernia, gastro esophageal reflux disease and dysphagia after sleeve gastrectomy. After the abdominal cavity was accessed the dissection began from the lesser curvature side of the sleeve gastrectomy with adhesions between the left lobe of the liver and the lesser curvature of the stomach. A 32-French Ewald tube was passed to identify the esophagus. Pars densa and pars flaccida were taken down. The phrenoesophageal membrane was taken down. The right and left crus of the diaphragm were exposed and the herniated stomach was taken down utilizing blunt and sharp technique. Once the proximal stomach was completely reduced, it was divided proximally creating a pouch which was approximately 15 cc in diameter. The ligament of Treitz was identified and 50 cm from ligament of Treitz, the small bowel was transected. Distal limb of small bowel was brought to the upper abdomen in antecolic fashion without tension. A side-to-side gastrojejunostomy was performed. Finally a side-to-side jejunojunction between the biliopancreatic and alimentary limbs were performed with linear stapler. The hiatus was closed with a running 2 Prolene unidirectional barbed sutures.

Results: The patient tolerated the procedure well with minimal blood loss. An upper GI Gastrografin showed no evidence of leak or obstruction. The patient was discharged home on post-operative day 4.

Conclusion: Acute herniation of the gastric sleeve is a possible but under-reported complication. Reduction of the hiatal hernia and conversion to

RYGB is a feasible treatment for obese patients with hiatal hernias after Sleeve Gastrectomy.

A165

CONVERSION OF HORIZONTAL GASTROPLASTY TO ROUX-EN-Y GASTRIC BYPASS FOLLOWED BY ESOPHAGOJEJUNOSTOMY FOR OBSTRUCTION

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Introduction: A 50 year old female with a twenty year remote history of an open horizontal gastroplasty failed to have any substantial weight loss. She underwent Roux-en-Y gastric bypass and was discharged home on postoperative day (POD) 2 tolerating a clear liquid diet. However, she developed progressing nausea and vomiting. An upper endoscopy showed impacted food at the distal esophagus with a stricture secondary to mucosal hyperplasia at the gastrojejunostomy. After a failed attempt at dilation she was scheduled for surgery with a planned resection of the gastric pouch and creation of an esophagojejunostomy.

Materials and Methods: An Edlich tube was attempted at passing the gastroesophageal (GE) junction unsuccessfully. An upper endoscopy was performed, and again could not pass the GE junction. A gastrostomy was then created distal to the stricture and it was noted that the previous staple line from the old horizontal gastroplasty had almost completely obliterated the lumen of the gastric pouch. Thus, the gastric pouch, gastrojejunal anastomosis, and proximal jejunum were resected and an esophagojejunostomy was created.

Result: The patient had a benign hospital course. Upper gastrointestinal series on POD 5 showed no leak. The patient was discharged home on POD 6. She has since advanced her diet to mechanical soft and is maintaining nutrition without tube feeds.

Conclusion: Esophagojejunostomy is an effective treatment for obstruction at the GE junction after conversion of horizontal gastroplasty to Roux-en-Y gastric bypass.

A166

Laparoscopic Partial Gastrectomy with Esophagojejunostomy Reconstruction for Sleeve Gastrectomy with Stricture

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Introduction: Laparoscopic sleeve gastrectomy (LSG) is the most popular bariatric procedure. Leaks after this operation are difficult to treat and can become chronic. Chronic fistulas required a gastrectomy with Roux-en-Y esophagojejunostomy (RYGEJ). The aim of the video is to show our technique laparoscopic proximal gastrectomy with RYGEJ.

Methods:We present a case of a 57-year-old female with BMI of 49 kg/m², which had seven-year history of dysphagia after a conversion from vertical banded gastroplasty to LSG. She was diagnosed with a stricture from a chronic leak after a LSG. After the abdominal cavity was accessed, adhesions were taken down with a combination of endoscopic scissors and ultrasonic shears. Once the stomach was completely mobilized, both the left gastric artery and stomach were divided with a linear

stapler. The hiatus was opened, and esophagus was then divided in the abdomen. Using a linear stapler an esophagojejunostomy was performed, followed by a jejunojunostomy. The diaphragmatic crura were closed with a running unidirectional barbed suture. Drains are placed in the hiatus and left upper quadrant. Incisions were closed.

Results:There were no perioperative complications. Postoperative gastrografen study showed free passage of contrast through the esophagojejunostomy without leakage. The patient was discharged home on post-operative day seven. Two weeks after the operation, she developed an incarcerated incisional hernia that required an operation. She recovered uneventfully.

Conclusion: Leak after LSG is one of the most serious and devastating complications. Laparoscopic Roux-en-Y esophagojejunostomy is a feasible and safe approach in the management of chronic leaks with stricture.

Integrated Health Abstract Session

Wednesday November 2nd, 10:15am – 12:00pm

A167

Prescribed Opioid and Non-Opioid Analgesic Medication Use Before and After Bariatric Surgery: 7 Year Follow-up

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Graduate School of Public Health, Unive¹ Biostatistics, University of Pittsburgh² Epidemiology, University of Pittsburgh³ Surgery, UPMC⁴ Weill Cornell Medical College⁵ Surgery, University of Washington⁶ Psychiatry, University of Pittsburgh School of Medicine⁷ Pharmaceutical Sciences, NRI⁸ Surgery, Brody School of Medicine⁹ Surgery, Oregon Health Sciences Universi¹⁰ NIDDK¹¹

Background: Evidence suggests the majority of patients experience clinically significant improvements in pain following bariatric surgery, which is maintained through 3 years of follow-up. However, whether improvement in pain translates

to changes in use of prescribed analgesic medications, and the durability of improvement in pain beyond 3 years are unknown. This study examines use of prescribed non-opioid and opioid analgesic medications, and medications for opioid dependency prior to and following bariatric surgery. Non-steroidal anti-inflammatory drugs (NSAID) were examined separately because they are contraindicated following Roux-en-Y gastric bypass (RYGB) and may play a role in post-surgery opioid analgesic medication use.

Methods: The Longitudinal Assessment of Bariatric Surgery-2 is a 10-center observational study of 2458 adults who underwent bariatric surgery between 2006-2009. Pre-surgery, 6 months post-surgery and annually post-surgery for up to 7 years, participants reported the name and frequency of use of prescribed medications. This analysis includes 1565 participants who underwent RYGB and 553 who underwent laparoscopic adjustable gastric banding (LAGB) and who had baseline and follow-up prescribed medication data. Generalized linear mixed models tested for trends in prevalence of as needed/at least weekly use over time of opioid and non-opioid analgesic medications, NSAID, and medications for opioid dependency. Comparisons were made between baseline and 6 months and baseline (BL) and 7 years (Y7).

Results: Annual follow-up ranged from 71% to 90%. Of participants who underwent RYGB, 80% were female and 85% were white, with median body mass index (BMI) 46 kg/m²; and median age 45 years. Of those who underwent LAGB, 77% were female, 90% were white, with median BMI 44 kg/m²; and median age 48 years. Among participants who underwent RYGB (Figure 1A), modeled prevalence rates of opioid and non-opioid analgesic medication use were initially lower following surgery than before surgery, but then increased to higher than baseline levels (opioid: 15.4% [95% CI, 13.7-17.1] BL vs. 21.5% [95% CI, 18.9-24.1] Y7; non-opioid: 22.3% [95% CI, 20.3-24.3] BL vs. 26.0% [95% CI, 23.1-28.8] Y7). NSAID use followed a similar pattern, but remained lower than baseline through year 7 (10.7% [95% CI, 9.2-12.2] BL vs. 7.8% [95% CI, 6.0-9.7] Y7). Among participants who underwent LAGB (Figure 1b), modeled prevalence of opioid analgesic medication use increased to higher than baseline use by year 7 (13.7% [95% CI, 10.9-16.6] BL vs. 18.0% [95% CI, 14.1-22.0] Y7), whereas non-opioid analgesic medication use did not vary significantly over time (18.6% [95% CI, 15.4-21.8] BL). Although NSAID use followed a quadratic trend indicating an initial drop in prevalence followed by an increase, the changes were small and baseline prevalence (10.2% [95% CI, 7.6-12.6]) did not significantly differ from prevalence at either 6 months or year 7. Use of medications for opioid dependency was rare before and after both procedures (<2% at all time points). Following RYGB, medications for opioid dependency increased from baseline (0.9% [95% CI, 0.4-1.4]) through year 7 (1.8% [95% CI, 1.0-2.7]).

Conclusion: In this observational study of adults who underwent bariatric surgery, the percentage of participants taking prescribed opioid analgesic medication increased in the 7 years following RYGB and LAGB, as did treatment for opioid dependency following RYGB. There was an initial decrease in non-opioid analgesic medication use, and specifically NSAID use following RYGB that lessened over time; however, only non-opioid analgesic use eventually surpassed baseline prevalence. Neither use of non-opioid analgesic medications in general, nor specifically NSAID, decreased following LAGB. Given the increasing prevalence of prescription opioid analgesic medication following bariatric surgery, future work should investigate factors associated with continuation and initiation of use following bariatric surgery.

A168

Bariatric surgery in patients with bipolar disorders: Selection factors and long-term surgical outcomes

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As many as 3% of bariatric surgery candidates are diagnosed with bipolar disorder, however, little is known about the specific outcomes for patients with severe mental illness, such as bipolar disorder. Additionally, little empirical data is available on the results of the psychological evaluation for patients with bipolar disorder and about why some patients with bipolar disorder are approved for surgery by mental health providers while others are not. Thus we had two main objectives: 1) describe differences between patients with bipolar disorder who are approved and not approved for surgery by the mental health evaluator; 2) to examine surgical outcomes of patients with bipolar disorder. A retrospective record review was conducted of 3,263 consecutive patients who applied for bariatric surgery between 2004 and 2009 at an academic medical center in the United States. Patients with bipolar disorder who were approved for surgery were compared with patients with bipolar disorder who were not approved and to matched control surgical patients without bipolar disorder on a variety of clinical and psychosocial characteristics and surgical outcomes. Results show that, of the 73 patients with bipolar disorder who applied for bariatric surgery (2.2% of all candidates), 36% (n=26) were initially approved, 45% (n=33) were initially delayed, and 19% (n=14) were initially denied. Among candidates who were initially delayed for surgery, 49% (n=16) were approved for surgery after being adherent with their treatment plan. Psychological evaluators made an effort to discuss bariatric surgery with candidate's therapist, and 100% of the therapists who were reached supported their patient getting surgery. Among all candidates with bipolar disorder, 48% (n=35) ultimately had surgery at the clinic. Patients with bipolar disorder who were ultimately approved for surgery (n=42) were more likely to be Caucasian (97.6% vs. 87.1%) and to have no previously psychiatric hospitalizations (40.5% vs 71.0%) than those who were not approved for surgery (n=31). The majority of patients who had surgery had Roux-en-y gastric bypass (n=26 out of 29 in both bipolar group and matched group, 89.7%). Patients with bipolar disorder attended follow-up care (medical

and behavioral) at similar frequency as those without bipolar disorder during the first year post-surgery, but were less likely to attend medical follow-up appointments 2 or more years post-surgery (38% vs 69%, $p=.02$). Regarding weight changes, at six months post-surgery, patients with bipolar disorder had a significantly smaller percent excess body weight loss (54% vs 65%, $p=.05$), whereas at 1 year and 2 or more years post-surgery (mean of 51 months), no differences in weight losses were observed. In conclusion, while patients with bipolar disorder have a high rate of delay/denial for bariatric surgery based on psychosocial evaluations, carefully screened patients, even those with a history of severe psychiatric problems, may benefit from bariatric surgery. Efforts are needed to improve long-term follow-up care attendance among patients with bipolar disorder

A169

Pathways to Address Early Weight Regain

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Background: Long-term (10 year) follow-up of Roux-en-Y gastric bypass (RYGB) patients find that a regain of 20 to 25% of initial weight loss is not uncommon. However, we have observed among our bariatric population that some individuals begin to regain weight as early as one to two years post-surgery. Such early weight regain, if not addressed, may contribute over time to failed weight loss success and a recurrence of associated co-morbidities. In this report, we have: 1) determined the incidence of early weight regain following bariatric surgery, 2) attempted to identify possible predictors, and 3) discussed pathways for early weight regain intervention.

Methods: The study population included 404 bariatric patients (330 totally robotic RYGB and 74 sleeve gastrectomy; SG) with postoperative follow-up for 24 months or greater. Preoperative BMI of patients averaged 47.0 ± 7.5 (SD), mean weight was 290.8 ± 56.7 lbs (132.2 kg), and mean age was 51.6 ± 12.8 . Among the population, 76% were females and 24% males. Total percentage weight loss for the study population averaged, 34.1% at year one, and 34.2% at year two. Individuals who regained $\geq 5\%$ of their first year weight loss from postoperative years 1 to 2 were grouped as weight 'regainers'.

Those who lost $\geq 5\%$ of their initial weight loss were grouped as weight 'losers', and individuals whose weight remained stable ($< 5\%$ change) were categorized as weight loss 'sustainers'.

Results: At postoperative year one, average weight loss was 99.5 ± 31.5 lbs (45.2 kg) for all patients, 102.3 ± 31.4 lbs (46.5 kg) for the RYGB and 86.4 ± 3.4 lbs (39.3 kg) for the SG ($p < 0.001$ between surgical procedures). By postoperative year two, 30% of patients had maintained their initial one-year weight loss (sustainers); 33% (weight losers) had lost additional weight (mean = 15.0 lbs or 6.8 kg); and 37% of the study population had regained $\geq 5\%$ of their initial weight loss (regainers), with 21% of patients having regained $+10\%$, for an overall increase of 15.4% (13.3 lbs; 6.0 kg). Both the proportion of patients who experienced early weight regain and the extent of weight gained were greater following SG than RYGB (% population early weight gainers = 55.4% of SG population vs. 33.3% RYGB, and weight regained = 18.5% vs. 14.2%, respectively). For all bariatric patients and each surgical procedure, there were no significant differences ($p > 0.050$) between weight gainers vs. losers with regard to gender, age, initial BMI or initial weight loss; and, according to multiple regression analyses, none of these measures were significant predictors of weight gain. Based upon the relatively high incidence of early weight regain following surgery, we established pathways to address the issue. These now include: 1) education regarding the risk for early weight regain, the need for frequent monitoring, and potential causes for weight regain, 2) the development of 'Back on Track' classes provided by our bariatric dietitians to review food choices, vitamin needs, adequate protein, fluid, and physical activity, 3) behavioral classes and counseling to address emotional stressors, food addictions, 4) referral to our intensive multidisciplinary lifestyle program, 5) medical management, and 6) surgeon consultation and testing for surgery-related technical issues.

Conclusions: Following the first postoperative year, more than 1/3 of bariatric patients experience early weight regain. Neither the magnitude of weight loss over the first year nor patient age, gender or initial body size are predictors of this early regain of surgery-induced weight loss. As early weight regain may be detrimental to long-term weight loss success and health, it is important to continue efforts to identify individuals at risk and provide early and appropriate intervention including education, nutritional and multidisciplinary classes, intensive

lifestyle programs, medical management and surgical revision.

A170

Outcomes after laparoscopic conversion of failed adjustable gastric banding to vertical sleeve gastrectomy (VSG) or Modified Duodenal Switch(MDS) with single anastomosis

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Introduction: Although there is evidence of a high failure of weight loss in laparoscopic adjustable gastric banding (LAGB), the most effective revision procedure has yet to be determined. Several studies have investigated effective revision procedures however no consensus has been reached. Therefore, we designed and conducted a retrospective study comparing the outcome of conversions of LAGB to either laparoscopic vertical sleeve gastrectomy (VSG) or modified duodenal switch (MDS) over the past 3 years.

Methods: Patients who underwent conversion from LAGB to either VSG (bougie of 36-40) or MDS (bougie 42, single anastomosis and 3 meter efferent limb) between January 2013 and March 2016 were included in the study. The percentage of excess body weight loss (%EBWL) and body mass index (BMI) unit loss between two groups were compared from 1-90days, (29/29 VSG) (18/18 MDS) 91-180 days (25/29 VSG) (13/16 MDS) and more than 180 days. (19/28 VSG) (8/11 SIPS)

Results: Forty-seven (47) patients with failed LAGB were included. Out of 47 patients, 29 underwent VSG and 18 MDS. The mean BMI and excess body weight (EBW) in the MDS group were higher than in VSG (mean BMI SIPS = 47.6, BMI VSG =44.9) (mean EBW MDS =160 lbs, mean EBW VSG=143 lbs). The incidence of hyperlipidemia in MDS group was significantly higher (MDS =33.3%, VSG 6.9%; p=0.0019). There was no significant difference in diabetes, sleep apnea or hypertension. Both EBWL% and BMI loss in MDS were significantly greater than VSG post-operatively (p<0.05). At 1-90days, MDS showed EBWL% mean of 25% (SD=11), 91-180days EBWL% mean of 47% (SD=11) and at >180days EBWL% mean of 62% (SD=14). In VSG group, 1-90days EBWL% mean of 15% (SD=8), 91-180days EBWL% mean of 33% (SD=17), >180days EBWL% mean of 51%, (SD=15). We defined 'adequate weight loss' as percent of EBWL of at least 50%. In patients

with > 1 year of follow up 84% of VSG had adequate weight loss (16/19) and 100% of MDS 4/4) appointment, The MDS group had two patients with serious adverse events: incarcerated hernia and bowel perforation after an open cholecystectomy, while the VSG group had only one patient with an adverse event: pulmonary embolus and anemia. There were no leaks at the sleeve gastrectomy suture and all cases were done in a single stage. There was a single reoperation in the post-operative period in the MDS group.

Conclusion: Conversion to either VSG or MDS can be performed in a single stage with operator experience. Both operations lead to effective weight loss with 20 of 23 patients having greater than 50% EBWL% at one year. As expected weight loss is superior when the intestinal component is utilized. No unique complications were identified secondary to the loop or single anastomosis configuration. There were no complications outside the immediate post-operative period in either group. We plan to follow this cohort further to determine the net weight loss differences and ascertain the difference in nutritional consequences.

A171

Long-term comparison of nutritional deficiencies after duodenal switch versus gastric bypass in the super-obese (BMI ≥ 50 kg/m²)

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Objective(s): While surgery is the most effective treatment for morbid obesity, patients with super-obesity (BMI ≥ 50 kg/m²), frequently have inferior results and more treatment failure than those with a BMI < 50kg/m² with commonly performed bariatric procedures (sleeve gastrectomy and gastric bypass). The duodenal switch (DS) has been shown to provide superior weight loss and metabolic comorbidity remission compared to gastric bypass (RYGB). In addition to these considerations, procedure selection requires attention to the potential long-term nutritional consequences of surgery. While modest deficiencies may be amenable to standardized repletion protocols, severe deficiencies may result in significant morbidity and require surgical intervention. We hereby report a long-term comparison of nutritional outcomes in super-obese patients undergoing DS and RYGB.

Methods: Biochemical assays of nutritional parameters were collected during routine clinical

follow-up in 350 consecutive super-obese patients who underwent DS and RYGB between 5/2002 and 10/2005. Fisher Exact Tests were used to compare percentage of patients with both low and critically low levels of various nutritional markers up to 8 years post-operatively.

Results: 350 super-obese patients [DS (n=198), RYGB (n=152)] were identified. A significantly greater proportion of deficient values were found in DS patients at multiple post-operative time points for Vitamin A, Vitamin D, Vitamin E, Zinc, Selenium, Iron, Hemoglobin, and Albumin, ($p < 0.05$). When critically low values of these markers were assessed, a significantly higher percentage of Vitamin A, Vitamin D, Zinc, and Iron deficiencies persisted in DS patients. Folate and vitamin B12 levels were not significantly different between the two groups. Five DS patients (2.5%) underwent surgical revision of their operation due to malnutrition.

Conclusions: The duodenal switch is associated with a higher incidence of abnormal laboratory values involving several important nutritional indices compared to RYGB in patients with super-obesity in an urban academic medical center setting. These findings must be appropriately considered in the context of the superior weight loss and resolution of metabolic co-morbidities that the DS affords patients with super-obesity.

A172

The Perceived Value of Bariatric Nurse Certification

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Background: Greater than 1750 registered nurses (RNs) have been certified in bariatric nursing since 2007. However, the value of this certification and the intrinsic and extrinsic rewards attached to it, have not been investigated.

Objectives/Aims: The purpose of this descriptive investigation was to explore bariatric nurses' perceptions of the value of bariatric nursing certification and the perceived intrinsic and extrinsic rewards. Secondary aims were to compare the

perceived value of bariatric certification with the perceived value of certification by nurses in other specialties; to compare the perceived value of certification between certified bariatric nurses (CBNs) versus non-certified bariatric nurses (non-CBNs); and with those from other specialties.

Method: To measure the value of certification, we utilized the Perceived Value of Certification Tool (PVCT©). It contains 12 intrinsic and 6 extrinsic items scored on a 5 point Likert scale. The reward value of certification is recognized as having intrinsic values (internal rewards) such as those associated with professional confidence and a sense of accomplishment, and extrinsic values (external rewards) such as those associated with marketability, increased salary and recognition from others. We invited bariatric nurses to participate utilizing the American Society for Metabolic and Bariatric Surgery Society (ASMBS) database (members and non-members). Additionally, we obtained previously published data from the American Board of Nursing Specialties (ABNS) that included nurses' responses to the PVCT for a comparison. We used student *t*-tests for comparisons of the means (+/- standard deviations) and Pearson's Chi-square. There were no adjustments for multiple testing; statistical significance was $p < .05$. Effect sizes (Cohen's *d* or Cramer's *V*) were determined for specified comparisons. A medium effect size was considered meaningful. The University of Pittsburgh provided institutional review.

Results: A total of 462 bariatric nurses responded to the web-based survey (response rate 26.7%). Respondents were predominantly female (96.7%), aged 41-60 years (68.2%), with greater than 20 years nursing experience (60.3%), greater than 5 years' experience in bariatric nursing (70.3%), and with a bachelor degree (42.2%). More than half were CBNs (62.1%) and most were members of ASMBS (81.2%). Demographic differences between CBN's and non-CBN's were significant only for sex ($p = .005$). Non-CBN's had a greater number of males, and less years of experience in bariatric surgery ($p < .001$). The ABNS data included responses from 11,427 nurses from at least 20 different nursing specialties. They were predominantly female (91.6%), with greater than 20 years' nursing experience, and with a bachelor degree (43.4%). Seventy five percent identified themselves as certified nurses. For bariatric nurses, there was high agreement with the overall value of certification (3.38 +/-0.50), including intrinsic values (3.50 +/-0.50), and extrinsic values (3.10 +/-0.61). The

highest proportion of bariatric nurses (69.5%) strongly agreed that certification 'enhances feelings of personal accomplishment'. The highest proportion and strongest disagreement (24.4%) was with 'increases salary' for this group. However, CBNs (n=287) scored significantly higher than non-CBNs (n=171) for all three mean scores and with larger effect sizes. For the overall value, CBNs scored 3.45+0.47 versus non-CBNs (3.26+-.53, p<.001, d=.40); 3.59+0.47 versus 3.37+0.52 (p<.001, d=.43) for intrinsic values, and 3.18+0.59 versus 3.03+0.1 (p=.009, d=.25) for extrinsic values for CBNs and non-CBNs respectively. On an item-by-item basis as shown in Table 1, significant differences were identified in the majority of the items, with a higher proportion of CBNs agreeing more strongly than non-CBNs. However items without significant differences included agreement by both groups that certification 'promotes recognition from employers' (>80%, p=.638), 'provides professional challenge' (>93%, p=.384), 'increases marketability' (>80%, p=.129), and 'increases salary' (>27%, p=.077). For comparisons between bariatric nurses (n=462) and those from other specialties (11,185), and between CBNs (n=287) compared with nurses who were certified in other specialties (n=8450), there were no statistically significant (all p>.05) or meaningful differences (all d<.50) for the mean scores for overall value, intrinsic or extrinsic values perceived. Non-certified bariatric nurses (n=171) compared with non-certified nurses in other specialty areas (n=2734) scored significantly higher for overall value (3.25+0.53 versus 3.16+0.54, p=0.025), for intrinsic values (3.37+0.52 versus 3.28+0.57, p=0.048), and extrinsic values (3.03+0.61 versus 2.91+0.63, p=0.016) with very small effects sizes (all d<.02) for non-CBNs and non-certified nurses in other specialties, respectively.

Conclusions: This study is the first to report that bariatric nurses, certified and non-certified in bariatric nursing, highly value bariatric nursing certification. There were some significant differences between certified and non-certified bariatric nurses. The greatest differences were found in the increased intrinsic values held by those certified. Bariatric nurses and nurses of other specialties do not seem to differ in their overall value of nursing certification. However, non-certified bariatric nurses seemed to value certification more highly than non-certified nurses from other specialties. Future studies should investigate whether the perceived value of certification for bariatric nurses changes over time and whether this

affects re-certification, and to examine whether differences exist between US bariatric nurses and those internationally.

A173

A Prospective, Longitudinal Examination of Suicidal Ideation among Bariatric Surgery Patients

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Background: A meta-analysis shows that bariatric surgery patients have a four-fold risk for death by suicide compared to the general population [i.e., 4.1 (95%CI, 3.2-5.1) /10,000 person-years following bariatric surgery vs. 1/10,000 person-years in the general population, after controlling for country, age and sex]. However, the comparison did not control for several suicide risk factors, such as depression, substance abuse, and eating disorders, which disproportionately affect adults seeking bariatric surgery. A comparison of suicidal ideation (i.e., thoughts and plans about suicide) pre- and post-surgery will inform if and then how bariatric surgery impacts risk of suicide.

Methods: The Longitudinal Assessment of Bariatric Surgery-2 is an observational, prospective cohort study conducted at ten U.S. hospitals. Adults with severe obesity undergoing bariatric surgery were recruited from 2005 to 2009. This report utilizes follow-up through five years. A revised version of the Suicidal Behaviors Questionnaire assessed lifetime pre-surgery history and five year post-surgery history of suicide ideation as thoughts, plans or suicide attempts. The Beck Depression Inventory-I (BDI), administered pre-surgery and annually post-surgery, assessed suicide ideation over the past week as thoughts or plans of self-harm or suicide. Using the BDI measure, Poisson mixed models with robust

error variance were used to 1) estimate and compare prevalence of suicidal ideation over time, and 2) determine pre-surgery factors and pre- to post-surgery changes associated with post-surgery suicidal ideation. The post-surgery suicide rate per person-year was estimated.

Results: More than two thirds (71.6%) of participants denied any history of suicidal ideation pre- or post-surgery. Before surgery, 5.5% of participants had ever had a plan to kill themselves without a suicide attempt and another 4.1% had attempted suicide. Within five years post-surgery, 3.2% had a plan to kill themselves without an attempt, and another 0.8% had attempted suicide. All of those who attempted suicide after surgery had at least a brief passing thought of suicide prior to surgery. There were no significant differences in prevalence of suicidal ideation between the baseline (5.3% [95% CI, 3.7-6.8]) and follow-up assessments at year-one (3.8% [95% CI, 2.5-5.1]) or year-five (6.6% [95% CI, 4.6-8.6]). Suicide ideation and past-year psychiatric treatment prior to surgery were significantly associated with greater risk of post-surgery suicidal ideation. In addition, being male (RR=1.44, 95% CI, 1.04-1.98), being younger (RR=1.16, 95% CI, 1.02-1.34, per 10 years), smoking (RR=1.67, 95% CI, 1.19-2.36), having worse perceived general health (RR=1.09, 95% CI, 1.01-1.70, per 5 SF-36 points), greater bodily pain (RR=1.12, 95% CI, 1.03-1.22, per 5 SF-36 points), and a history of psychiatric hospitalization (RR=2.32, 95%

CI, 1.69-3.20) increased the risk of suicidal ideation following bariatric surgery. After controlling for pre-surgery factors, several changes since surgery were also significantly associated with higher risk of post-surgery suicide ideation: getting divorced versus staying married (RR=2.23, 95% CI, 1.11-4.51), a decrease in perceived general health (RR=1.09, 95% CI, 1.03-1.16 per 5 SF-36 points), and more depressive symptoms (RR=1.70, 95% CI, 1.58-1.82 per 5 BDI points). Over five years of follow-up, there were 3 deaths adjudicated as suicides, another 1 definite drug or alcohol overdose, and 1 more probable drug or alcohol overdose. These 5 deaths occurred, on average, 3.7 years post-surgery. When limited to confirmed suicides, the suicide rate was 2.3 (95% CI: 0.3-8.3) per 10,000 person-years. Including the 2 overdoses, the suicide rate was 3.8 (95%CI: 1.0-9.7) per 10,000 person-years.

Conclusions: These findings suggest that although the suicide rates may be higher among bariatric surgery patients compared to the general population, prevalence of suicide ideation is not significantly higher following vs. prior to bariatric surgery per se is not associated with suicidal ideation. Rather, individuals with pre-existing risk factors (e.g., history of psychiatric hospitalization) or who experience risk factors similar to those in the general population (e.g., marital status change) may experience suicidal ideation following surgery. Bariatric patients should be routinely assessed for suicidal ideation and its risk factors.

Pre-Conference: Master's Course in Behavioral Health I Monday October 31, 2016 1:30-5:30pm

A174

Changes in psychotropic medications after Roux-en-Y gastric bypass or sleeve gastrectomy

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Despite the high prevalence of psychiatric disorders in bariatric surgery candidates, there is a paucity of research examining the frequency and efficacy of psychotropic medications post-operatively. This is particularly true for the sleeve gastrectomy, which is rapidly gaining popularity as a primary procedure. Retrospective chart review was used to examine psychotropic medication pre-operatively and at 3, 6, 12, and 24 months post-operatively for 275 patients who had the sleeve gastrectomy ($n = 207$, 75.3%) or Roux-en-Y gastric bypass ($n = 68$, 24.7%). At baseline, 50.5% of patients were prescribed an antidepressant, 6.2% were prescribed a mood stabilizer, and 5.1% were prescribed an antipsychotic. Of the patients taking an antidepressant at baseline or two years after surgery, 37.2% were on the same antidepressant, 33.3% were taking a higher dose or an additional antidepressant, and 12.7% changed to a different antidepressant two years after surgery. In comparison, only 16.6% of those taking an antidepressant at baseline were able to discontinue use at two years. The overall percentage of patients prescribed an antidepressant at 2 years (55.8%) was slightly higher than at baseline. This study provides evidence of the persistent nature of psychiatric disorders and the fact that although surgery often results in a reduction of

medications that treat co-morbid medical conditions (e.g., hypertension, diabetes), patients are rarely able to decrease or discontinue use of psychotropic medications.

Pre-Conference: Master's Course in Behavioral Health II Tues November 1, 2016 8:00am – 12:00pm

A175

Using the Pre-Surgical Psychological Evaluation to Predict Suboptimal Weight Loss Outcomes 5-Years Following a Roux-en-Y Gastric Bypass

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Background: The Roux-en-Y Gastric Bypass (RYGB) procedure demonstrates efficacy for weight loss among persons with obesity; however, a subset of patients achieve suboptimal weight loss. Although some studies have asserted that psychosocial factors and maladaptive eating behaviors contribute to suboptimal outcomes; research has been inconsistent regarding the associations between preoperative psychiatric diagnoses and psychological testing results and suboptimal weight loss, weight regain, or redevelopment of maladaptive behaviors following surgery. The current investigation examined the utility of pre-surgical psychiatric diagnoses derived from a semi-structured clinical interview and test scores from the Minnesota Multiphasic Personality-Inventory - 2 - Restructured Form (MMPI-2-RF) in predicting 5-year Body Mass Index (BMI) outcomes. It was hypothesized that individuals who evidenced some form of externalizing psychopathology (i.e., risk-taking behaviors, impulsivity) or internalizing psychopathology (i.e., anhedonia, anxiety, low frustration tolerance) prior to surgery would have higher 5-year BMIs and a slower rate of post-operative BMI-reduction as compared to patients who did not evidence increased levels of internalizing or externalizing psychopathology.

Methods: 446 consecutively consented patients who underwent RYGB at least 5-years ago were included in the study. A total of 74.2% of the sample were women. 66.2% were Caucasian, 19.7% were African American, and 14.1% were of another ethnicity. The mean age of participants was 46.75 years (SD = 11.63; Range 18 - 74). Patients' mean pre-surgical BMI was 49.14 kg/m² (SD = 9.50 kg/m²). Psychiatric diagnoses were obtained from a pre-surgical, semi-structured clinical interview and all participants were administered the MMPI-2-RF at their pre-surgical

evaluations. BMIs were collected at 4 post-operative time points: 3-months (M = 38.59 kg/m², SD = 7.62) 6-months (M = 34.59 kg/m², SD = 7.24, 1-year (M = 32.42 kg/m², SD = 7.63, and 5-years (M = 34.71 kg/m², SD = 7.57). Percent missing at the 4 post-surgical time points were: 3-months (15.5%), 6-months (24.7%), 1-year (28.3%), and 5-years (52.2%). Correlations between demographic or psychological variables and attrition over time suggested that younger individuals evidenced higher amounts of missing data over time ($r = -.18$). Statistical Analyses: Longitudinal structural equation modeling (SEM) was used for prediction analyses. Specifically, latent growth curves were used to model BMI-reduction across time. Full Information Maximum Likelihood was used to handle missing data across time. Path analyses were used to estimate whether pre-surgical psychopathology predicted 5-year post-surgical BMIs as well as the rate of BMI-change over the 5-year trajectory. Diagnoses were tested first followed by the MMPI-2-RF scales by scale set.

Results: A non-linear latent growth curve fit the outcome data best [$\chi^2(7) = 12.36, p = .09$, RMSEA = .041, CFI = .98, SRMR = .07], indicating that BMI-reduction across time was best modeled with a combination of linear and curvilinear trends. This non-linear trend implied that BMI-reduction was rapid from baseline through the one-year outcome. From one-year to five-years post-surgery, most patients evidenced a small increase in their BMIs. Age significantly predicted the rate of BMI-reduction across time ($\beta = .20, p = .005$), such that older individuals evidenced a slower rate of change over time. When psychiatric diagnoses were introduced into the model, a pre-surgical diagnosis of Binge Eating Disorder predicted higher BMIs at the 5-year outcome ($\beta = .16, p = .008$). Patients who scored higher on the MMPI-2-RF scales Behavioral/Externalizing Dysfunction ($\beta = .11, p = .030$), Low Positive Emotions ($\beta = .13, p = .032$), and Hypomanic Activation ($\beta = .13, p = .028$) also evidenced higher BMIs at the 5-year outcome after controlling for age and Binge Eating Disorder. In regards to predicting variability in BMI-reduction over time, patients who scored higher on MMPI-2-RF scales Hypomanic Activation ($\beta = .24, p = .002$), Anger Proneness ($\beta = .16, p = .004$), and Activation ($\beta = .17, p = .036$) prior to

surgery evidenced a slower rate of BMI-reduction over 5-years after controlling for age and Binge Eating Disorder.

Discussion: As hypothesized, patients with higher pre-surgical levels of externalizing (e.g., impulse control) and internalizing (notably with difficulty feeling positive emotions) psychopathology had higher BMIs five years post-operatively compared to patients who did not evidence such elevations at the time of their pre-surgical evaluation. In addition, both age and psychopathology predicted slower post-operative BMI-reduction. This indicates that pre-operative indicators of psychopathology are important in predicting post-operative outcomes. A closer follow-up with patients who evidence pre-surgical problems, both before and after surgery, may help improve outcomes. Post-operative psychological assessments may also enhance surgical outcomes.

A176

Psychological predictors of adherence to dietary recommendations after Roux-en-Y Gastric Bypass
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University of Oslo¹

Background: Adherence to dietary recommendations can be challenging after bariatric surgery. Unhealthy eating habits have been described as a main factor for suboptimal outcomes. Self-regulation is essential for adopting new or improving health behaviors and depends on changes in a set of interrelated cognitions such as planning, self-efficacy and action control skills (i.e., self-monitoring). There is limited data on self-regulatory factors involved in postoperative dietary adherence. A few studies have shown that lower self-efficacy, less planning and higher degree of depressive and anxiety symptoms were associated with non-adherence. To further extend our knowledge of eating behavior after bariatric surgery, we aimed to identify self-regulatory predictors of dietary adherence one year after gastric bypass surgery.

Methods: Measures of demographic variables, self-regulation variables (intention, planning, self-efficacy, action control), depressive and anxiety symptoms (Hospital anxiety and Depression scale, HADS) and adherence to dietary recommendations were taken one year after Roux-en-Y gastric bypass in 230 patients (78.3% women). All patients received pre- and postoperative education from clinical nutritionists regarding the dietary recommendations

after surgery. Adherence to the recommendations was evaluated according to the Norwegian national guidelines for healthy diet. Patients were asked: 'You have received recommendations regarding how/what to eat after surgery. To what degree does it correspond with how/what you have eaten the last four weeks?' (1 = little, 7 = a lot), followed by six recommendations (e.g., 'I eat five portions of fruit and vegetables every day', 'I limit my intake of sugar and fat' etc.). Specific nutritional recommendations, e.g., consumption of at least 60g of protein daily, vitamin substitution etc. were not evaluated. Action control involved items about *self-monitoring* behavior, *awareness of standard* (keeping one's goals in mind) and *effort* to avoid self-regulation failure.

Results: Mean (SD) body mass index (BMI) before and after surgery was 44.9 kg/m² (6.0) and 30.6 kg/m² (5.2), respectively. Total weight loss was 29.2% (8.2). There were no differences for any of the psychological variables depending on demographic groups (age, sex, marital status, education, employment) or initial BMI groups (< 40, 40-50, > 50 kg/m²). The self-regulatory variables intention, self-efficacy, planning and action control showed moderate and positive correlations with dietary adherence ($p < .001$), whereas depressive and anxiety symptoms showed small and negative correlations with the outcome measure ($p < .001$). Adherence to the recommendations was not associated with postoperative weight loss. Based on the multivariate regression analysis more planning ($\beta = 16.9, p < .01$), better action control skills ($\beta = 27.2, p < .001$) and lower degree of depressive and anxiety symptoms ($\beta = -16.6, p < .01$) predicted dietary adherence, explaining 26.5% of total variance.

Conclusions: This study adds to our understanding of self-regulatory variables involved in eating behavior after bariatric surgery. Action control was the strongest predictor of dietary adherence. To our knowledge this is the first time action control has been examined in this context. Our findings indicate that interventions targeting patients' self-regulation, and especially action control skills, might affect long-term outcomes after gastric bypass surgery.

A177

Pre-Surgical Depressive Symptom Clusters and Short-Term Post-Surgical Weight Loss Outcomes among Bariatric Surgery Patients

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Background: Depression is common among bariatric surgery candidates, but the impact of different depressive symptom clusters on surgical outcomes is currently unclear. Thus, the current study examined whether the depressive symptoms clusters (e.g., somatic vs. cognitive/affective symptoms) were differentially and/or uniquely related to pre-surgical weight or short-term post-surgical weight loss outcomes.

Methods: Depressive symptoms were assessed using the Beck Depression Inventory (BDI-II) as part of a bariatric pre-surgical evaluation in 335 candidates. The total BDI score and the somatic and cognitive/affective cluster subscale scores were calculated as well as a categorical variable of clinically depressed (BDI ≥ 12) or not (BDI < 12). Continuous scores were examined in relation to pre-surgical body mass index (BMI; kg/m²). Analyses examining the BDI total and subscale scores as predictors of percentage excess weight loss (%EWL) was also conducted in subsamples of individuals with 6-month ($N=244$, 73%) and 12-month ($N=217$, 65%) short-term post-surgical follow-up data. The somatic and cognitive/affective scores were entered together in a simultaneous model to ascertain their unique impact on the dependent variables.

Covariates included: age, sex, and race-ethnicity.

Results: Nearly 30% of the total pre-surgical sample endorsed moderate or severe depressive symptoms (BDI score ≥ 20). Regression results indicate that

the total BDI score was unrelated to pre-surgical BMI ($\beta = .025$, $p = .650$), adjusting for covariates. In simultaneous-entry models, neither cluster subscale was related to pre-surgical BMI ($\beta = -.072$, $p = .351$ for somatic cluster; $\beta = .091$, $p = .233$ for cognitive/affective cluster). Similarly, the total BDI score failed to predict %EWL at 6 or 12 months (all $p \geq .174$) although t-tests comparing clinically depressed to non-depressed persons indicated that depressed persons had higher %EWL at 6 months ($t(246) = 2.13$, $p = .034$) and 12 months ($t(219) = 1.94$, $p = .054$) (see Figure 1). In the simultaneous-entry models for the subscales, greater endorsement of cognitive/affective cluster symptoms predicted higher %EWL at 6 ($\beta = .194$, $p = .025$) and at 12 months ($\beta = .200$, $p = .027$). The somatic cluster was unrelated to %EWL (all $p \geq .170$).

Conclusions: Results indicate that, while 30% of bariatric surgical candidates in this sample endorsed moderate or severe depressive symptoms, the cognitive/affective cluster (e.g., self-dislike, anhedonia) may have a stronger prognostic influence on short-term post-surgical outcomes than the somatic symptoms (e.g., fatigue, appetite changes). Somatic symptoms of depression may not be predictive of weight outcomes given that they overlap with common side effects of obesity. Another potential explanation is that individuals with higher levels of cognitive/affective symptoms are more psychologically distressed and may be more motivated to adhere to strategies that promote successful weight loss post-surgery. These possibilities should be examined in future studies with longer follow-up periods.

Pre-Conference: Master's Course in Behavioral Health III Monday October 31, 2016 1:30-5:30pm

A178

Body Image and Anthropometric Outcomes Three Months After Bariatric Surgery

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Background: Body image is an important component of psychological health and a broad literature exists relating to its measurement, however there is a paucity of research examining body image in bariatric surgery patients. Few studies have examined the relationship of body image with

anthropometric outcomes and whether this relationship is affected by the type of bariatric surgery. A comprehensive and systematic approach to analyze body image in bariatric surgery patients is needed. The purpose of this study was to examine the effect of bariatric surgery on body image and anthropometric outcomes to understand physiologic and psychological responses of patients 3 months after bariatric surgery. We also compared the differences in body image and anthropometric outcomes depending on the type of surgery, Roux-en-Y gastric bypass (RYGB) versus sleeve gastrectomy (SG).

Methods: A sequential sample of bariatric patients was recruited from an academic bariatric surgery program. Demographics, anthropometric, and body image measurements were made before and three months after bariatric surgery. Anthropometric measures included body mass index (BMI), percent excess body mass index loss (%EBMIL), and waist and neck circumference. Body image was measured using a combination of instruments. The Body Attitude Test (BAT) measures body image concern and global body satisfaction. The Body Checking Questionnaire (BCQ) measures compulsive self-monitoring. The Multidimensional Body Self-Relations Questionnaire measures appearance orientation (self-focus on appearance or grooming MBSRQ-AO) and appearance evaluation (MBSRQ-AE). The Topographic Device (TD) is a 5 foot surface with concentric circles radiating out from the center 11 to 54 inches in diameter, and it measures perceived body space. The Pictorial Body Image Assessment (PBIA) depicts figures along a continuum of underweight to severely overweight silhouettes, and measures body size estimation. Data were analyzed using paired t-tests and two-way ANOVA.

Results: The overall sample included 67 patients: 35 Roux-Y gastric bypass (RYGB), 28 Sleeve Gastrectomy (SG) and 4 Adjustable Gastric Band (LAGB). Demographic data as well as pre and post-op anthropometric and body image measurements are shown in the table. Mean patient age was 48.8 +/- 11.4 yrs and preop BMI was 50.3 +/- 9.2 kg/m². Due to the low frequency of LAGB operations, these patients were excluded from comparative analysis. There were no differences between RYGB and SG with any anthropometric measurements. BMI decreased to 42.2 (RYGB) and 42.2 (SG) at 3 months after surgery. %EBMIL was 33.7 at 3 months. Mean body image measurements preoperatively deviated from values seen in non-obese populations in a manner consistent with their large body morphology. At 3 months postop, body image measurements changed towards those in non-obese populations using 4 of 6 body image measures (BAT, MBSRQ-AE, TD, PBIA) spanning the domains of global body satisfaction, appearance evaluation, perceived body space, and body size estimation. Specifically, the Topographic Device reflected a significant mean reduction ($p < .001$) of 6 inches in the diameter of occupied space 32.67 +/- 9.1 inches preoperatively compared to 26.27 +/- 7.8 inches at 3 months. Perceived body size was significantly reduced on the PBIA ($p < .001$); silhouette choice went down a mean of 2 figures corresponding to

mean scores of 8.66 +/- 1.6 preoperatively and 6.78 +/- 1.9 at 3 months. Compulsive self-monitoring (BCQ) and self-focus on appearance (MBSRQ-AO) did not change 3 months after bariatric surgery. No significant differences were found in any body image measures between RYGB and SG either before or 3 months after bariatric surgery. Although BMI and 4 body image measurements all changed significantly 3 months after surgery, the only significant correlation was a negative correlation between BMI and compulsive self-monitoring such that those with a higher self-monitoring score had a lower BMI decrease ($r = -0.290$).

Conclusions: Understanding body image is necessary for clinicians to effectively counsel patients, provide enhanced bariatric group support, and offer psychological assistance to patients who might struggle with the rapid physical changes occurring to their bodies postoperatively. Many, but not all, measurements of body image change during the first three months after RYGB and SG. Global body satisfaction, appearance evaluation, perceived body space, and body size estimation all improve during the 3 months after RYGB and SG, however the degree of improvement in body image does not correlate with BMI change. Compulsive self-monitoring correlates negatively with BMI change. There were no significant differences in BMI or body image change between RYGB and SG at 3 months postop.

A179

Hospital Course for Post-Surgical Bariatric Patients Requiring Specialty Eating Disorder Inpatient Treatment: A Case Control Study

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¹Johns Hopkins University School of Medicine

The emergence of disordered eating following bariatric surgery, including loss of control eating and grazing, has been well documented (de Zwaan et al. 2010; Kruseman et al. 2010; Nicolau et al. 2015). Symptomatology reaching the diagnostic threshold of Anorexia Nervosa or Bulimia Nervosa is less common and perhaps underreported (Marino et al. 2013), and evaluation of outcomes for post-surgical bariatric patients who require inpatient eating disorder treatment have not been examined. This study compared a small case-control sample ($N = 39$) of adult female inpatients diagnosed with an eating disorder and admitted to a specialty behavioral treatment program. All bariatric surgery cases (BS+;

$n = 13$; mean age = 44.6 years) previously underwent Roux-en-Y surgery and were matched to non-surgical controls (BS-; $n = 26$) using a 1:2 ratio by age, diagnosis, and whether the patient required weight gain at admission. Group comparisons were conducted for length of stay (in an integrated inpatient-partial hospital step-down program), discharge reason (clinical improvement or other), and admission and discharge BMI and rate of weight gain for underweight patients (4 lbs. below target weight). BS+ had longer lengths of inpatient and partial hospital stay than BS- ($p < .05$), adjusting for BMI at admission. No group differences were observed on reason for discharge. Amongst underweight patients ($n = 12$), BS+ and BS- were admitted and discharged at similar BMIs; however, BS+ gained weight more slowly (0.9 vs. 4.0 lbs./week) than BS- ($p = .028$). These preliminary data indicate that patients who develop clinical eating disorders post-bariatric surgery require a longer length of stay to achieve similar outcomes, including weight gain and clinical improvement, compared to patients with eating disorders without a surgical history. Further research is needed to evaluate long-term outcomes, focusing on reduction of disordered eating behaviors, following specialty eating disorder treatment for this population.

A180

Group binge eating treatment reduces mood symptoms in addition to binge eating behaviors and attitudes

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At the time of initial evaluation, up to 16% of bariatric surgery candidates meet criteria for Binge Eating Disorder (BED), and a substantial subset endorse related subclinical symptoms consistent with graze eating and/or Night Eating Syndrome. Pre-operatively, patients with BED report more depressive symptoms and poorer quality of life (physical and emotional) than those without BED. Research further suggests pre-operative binge eating is predictive of post-operative loss of control eating, which has been associated with less optimal weight loss, weight regain, and poorer psychosocial outcomes. The Cleveland Clinic BEST-Start program (Binge Eating Strategies and Tools), a four session

cognitive behavioral group intervention, was designed to reduce disordered eating in bariatric surgery patients. In a prior pre-post intervention study of bariatric surgery candidates, group members exhibited a significant decrease in both binge eating symptoms, as measured by the Binge Eating Scale (BES), and discrete binge eating episodes. The current study sought to determine the impact of the BEST-Start program on comorbid mood symptoms, given inclusion of topics such as stress management, relaxation training, and cognitive restructuring. One hundred twenty-six patients completing the program in 2015 were administered the BES and reported number of weekly binge eating episodes at the initial psychological evaluation and again after the group sessions. A subset of these patients also completed measures of depression (PHQ-9; $n = 67$) and anxiety (GAD-7; $n = 59$) at the first and final group sessions. Results revealed a significant reduction in average number of binge episodes (from 2.27 to 1.06 days per week; $t(124) = 5.32$, $p < .001$) and BES scores ($t(116) = 7.68$, $p < .001$), which decreased from the moderate range ($M = 19.76$, $SD = 7.74$) to the minimal range ($M = 13.50$, $SD = 8.13$), over the course of the four-week intervention. In addition, patients evidenced significant reductions in symptoms of depression ($t(66) = 4.17$, $p < .001$; PHQ-9 = 7.44 to 5.37; both in 'mild' depression range) and anxiety ($t(58) = 2.09$, $p < .05$; GAD-7 = 4.39 'mild' to 3.63 'normal'). These results are consistent with previous research demonstrating the effectiveness of BEST-Start in treating eating disorder symptoms and provide preliminary support for the use of the program in addressing comorbid mood symptoms.

A181

Efficacy of a Peer Coaching Model in Improving Bariatric Surgery Outcomes

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Stanford School of Medicine¹

Background: Social support has been shown to play a key role in weight loss for patients undergoing bariatric surgery. However, the effects of more individualized support on postoperative outcomes have not been well-researched. We previously reported our preliminary findings with a peer coaching model for patients undergoing bariatric

surgery. The current study details additional results of this model at further postoperative time points.

Methods: Peer Coaches were selected from the Stanford BMI Clinic and included 16 individuals ≥ 12 months post-surgery with excellent weight loss outcomes (percentage of excess weight loss [%EWL] $\geq 75\%$). All Peer Coaches underwent a nurse-led mentorship training course. 16 patients undergoing bariatric surgery were randomized to receive coaches and participated in monthly telephone calls with their assigned Peer Coach. Patients and coaches were paired on the basis of surgery type and gender. 16 patients were randomized to the control group and received no coach. Subjects in each group completed the Short Form (SF-36) Health Survey and Medical Outcomes Social Support Survey (MOS) preoperatively and at 3, 6, and 12 months following surgery. Demographic and anthropometric data were obtained for all groups. Weight, body mass index (BMI), and %EWL were also collected. Mann-Whitney U tests were used to analyze weight loss between groups; Wilcoxon matched-pairs signed rank tests were used to analyze weight loss over time. All data were analyzed using GraphPad Prism.

Results: Participants were on average 46.9 ± 2.4 years old, 84.4% female, and 65.6% Caucasian, with a preoperative BMI of 44.8 ± 0.9 kg/m². Peer Coaches were 57.5 ± 2.2 years old, 75.0% female, and 68.8% Caucasian, with a postoperative BMI of 26.3 ± 2.0 kg/m². Participants in both randomized groups lost considerable weight following bariatric surgery; cases had an average %EWL of 40.3% at 3 months, 46.1% at 6 months, and 51.4% at 12 months, while controls had an average %EWL of 36.4% at 3 months, 48.9% at 6 months, and 50.9% at 12 months. There were no significant differences in weight loss between groups at any postoperative time point. Peer Coaches also saw notable further weight loss following their assigned mentee's surgery with an average %EWL of 17.4% at 3 months, 23.2% at 6 months, and 37.9% at 12 months. SF-36 survey showed no preoperative differences in self-reported quality of life among any of the eight health domains. However, cases demonstrated significantly higher scores in the vitality (81.3 vs. 51.6, $p=0.0091$), social role functioning (96.4 vs. 81.3, $p=0.0455$), and mental health (88.6 vs. 73.8, $p=0.0485$) domains one year after surgery. MOS survey also showed cases to have greater overall social support indices at 6 ($p=0.0460$) and 12 months ($p=0.0091$).

Conclusion: Given the importance of social support in long-term weight loss, peer sponsorship may

present a unique strategy to maintain proper bariatric lifestyle practices over time. This study finds patients with assigned Peer Coaches to have enhanced perceived quality of life and greater overall social support one year following bariatric surgery. Furthermore, many Peer Coaches reported renewed focus on their own health as part of this program. The Peer Coach program could potentially decrease weight regain for mentor and mentee alike. Future studies could expand upon this model to provide additional support resources for patients undergoing bariatric surgery.

A182

Family support for changing eating habits three years after bariatric surgery

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University of Oslo1 Oslo University Hospital2

Background: Perceived level of social support for changing eating habits is suggested as essential for weight loss. However, inconsistent findings regarding the relationship between social support and obesity-related behaviors are reported in the general population. The impact of social environment on postoperative eating habits is insufficiently addressed. In qualitative studies patients describe lack of social support as important to their problems with changing lifestyle. A few quantitative studies have examined aspects of family social support after bariatric surgery and the findings are inconclusive. Social undermining or discouragement from the family, defined as behavior from the patient's social network that hinders goal attainment (intentionally or not), has rarely been studied. This study aimed to explore the association between family support for changing eating habits and adherence to diet recommendations, snacking, binge-eating behavior, trying to lose weight, and weight loss satisfaction three years after bariatric surgery.

Methods: The Social Support and Eating Habits Survey was answered three years after Roux-en-Y Gastric Bypass and Sleeve gastrectomy by patients in an ongoing prospective study ($n = 141/249$, response rate 56.6 %). The respondents (78.0 % women) had a mean (*SD*) age of 47.6 (9.3) years. Mean scores representing *encouraging* (5 items) and *discouraging* (5 items) family support (hereafter called *undermining*) for healthy eating were calculated. Example of items representing encouraging support was 'Encouraged me not to eat unhealthy foods

when I'm tempted to do so', while undermining included items such as 'Offered me food I'm trying not to eat', with response options from 1 = none to 5 = very often. *Adherence to the dietary recommendations* was evaluated according to the dietary guidelines of the Norwegian Health Directorate. Patients were asked: 'You have received recommendations regarding how/what to eat after surgery. To what degree does it correspond with how/what you have eaten in the last four weeks?' (1 = little, 7 = a lot), followed by six recommendations (e.g., 'I eat five portions of fruit and vegetables every day'). *Snacking* was measured by using the mean sum score of three questions regarding the frequency of snacking between meals, sweet snacking between meals, and drinking high-caloric beverages (1 = never, 5 = always). *Binge eating* episodes (no, yes) during the past six months were assessed using a question from Survey for Eating Disorders in conformance with the DSM-IV definition of binge eating symptoms. Finally, the respondents were asked if they currently were *trying to lose weight* (no, yes), and if they were *satisfied with their weight loss* (1 = extremely dissatisfied, 7 = extremely satisfied).

Results: Mean body mass index before and three years after surgery was 44.6 kg/m² (6.2) and 30.5

kg/m² (5.9), respectively. Total weight loss was 29.5% (8.2). There was no gender difference regarding family encouragement or undermining, and no difference between being single or in a relationship (partner/spouse). Family undermining for changing eating habits was positively correlated ($p < .001$) with snacking, and negatively correlated with satisfaction with weight loss ($p < .01$). Patients who reported trying to lose weight scored higher on family undermining compared with those not on a diet ($M = 2.4$ (0.7) vs. $M = 2.0$ (0.8), $p < .01$). Family undermining was higher among patients reporting episodes of overeating in the past 6 months compared to those with no overeating episodes ($M = 2.3$ (0.8) vs. $M = 2.0$ (0.8), $p < .05$).

Conclusions: Patients currently trying to lose weight and patients reporting overeating episodes, more frequent snacking, and weight loss dissatisfaction expressed more social undermining from the family. Family encouragement, or lack thereof, was not associated with any of the study variables. These observations emphasize the importance of family undermining in relation to lifestyle adjustment after bariatric surgery and should be further explored

Emerging Technology Innovations Summit

Friday November 4, 2016 3:45-5:15pm

A183

A Novel Approach to Glycemic Control in Type 2 Diabetes Mellitus, Partial Jejunal Diversion

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Background: Diabetes is a growing, global health crisis with more than 400 million affected. A person dies every six seconds due to diabetes, and 12% of the global health expenditure is spent on diabetes. Although metabolic surgery has been shown to be a most effective means of glycemic and weight control with concurrent obesity but are over- or normal weight. Metabolic mechanistic studies conducted in animals and humans of established metabolic procedures have demonstrated the important role the gut plays in glucose homeostasis and appetite control. A partial jejunal diversion (PJD) involving a single anastomosis, a side to side jejuno-jejunosomy, was evaluated in a murine model and

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OB klinika & Charles University, Prague¹ OB klinika, Prague² Ethicon, Inc., Cincinnati³ for Type 2 Diabetes Mellitus (T2DM) in patients with obesity, only a small percentage of surgical candidates undergo established procedures. Patients and referring physicians alike often consider the established procedures too dramatic. Less invasive, potentially reversible procedures are needed to meet the needs of the growing T2DM population, many of whom are not suffering

the results confirmed positive impacts on glucose homeostasis, cholesterol and body composition versus sham control. Given these findings and experience with this type of procedure in other conditions, a human feasibility study was undertaken in T2DM patients.

Methods: 15 adult subjects with inadequately controlled T2DM (HbA1c of 8.0% to 11.0%), body

mass index (BMI) of 27.0 to 40.0 kg/m², and C-peptide ≥ 3 ng/ml were consented and enrolled. The laparoscopic PJD anastomosis was constructed approximately 100 cm from the ligament of treitz and 250 cm from the ileocecal junction. Subjects were followed for one year.

Results: The PJD procedure was performed successfully by a single surgeon in 15 subjects (7 females, 8 males) with a mean (range) procedure time of 104.5 minutes (70 - 140). Mean time since T2DM diagnosis was 10.9 years (4 - 26) and a mean (range) age = 52.7 years (36 - 60). At baseline, mean (range) BMI = 34.1 kg/m² (27.4 - 39.8), HbA1c = 9.4% (7.8 - 10.7), and fasting plasma glucose (FPG) = 233.2 mg/dL (151.4 - 338.8). Fourteen (14) of the 15 subjects were receiving at least one anti-hyperglycemic agent (AHA) at study entry of whom 12 were on insulin. Eleven (11) subjects also were receiving anti-hypertensives and 10 were receiving dyslipidemia medications. Twelve months post surgery, the mean (SD) reduction from baseline in HbA1c was 2.3% (1.3) ($p < 0.001$) and for FPG was 92 mg/dL (53) ($p < 0.001$). A mean (SD) body weight reduction of 10.3% (5.8) ($p < 0.001$) also was observed. At study end, 13 subjects still required at least one AHA, including 8 still on insulin; 12 and 9 subjects were receiving anti-hypertensive and dyslipidemic medications, respectively. Seven (7) of the subjects (46.7%) had HbA1c $< 7\%$ at 12 months post-surgery, including 3 that had HbA1c $\leq 6.5\%$ with AHAs and 1 that had HbA1c $\leq 6.5\%$ with no AHAs. The PJD procedure was well-tolerated without serious perioperative complications. Patency of the anastomosis was confirmed by CT scan prior to study completion in all subjects. Two serious adverse events (one 2-day episode of lower extremity edema, and one episode of dehydration) were reported during the study; both resolved without sequelae. By 12 months, 14 of 15 (93%) subjects felt the outcomes of this procedure met or exceeded their expectations.

Conclusions: PJD offers promise as a less invasive, reversible procedure for the management of T2DM and warrants further study.

A184

Novel device to detect enterotomies in real time during laparoscopy - First in human trial during Roux-en-Y gastric bypass.

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Background: Undetected bowel perforations occur in 0.3%-1% of laparoscopic surgical procedures with an associated mortality rate of 5.3%. If a bowel injury is not identified prior to surgical closure, patients endure longer hospitalizations; as well as secondary surgeries and other procedures such as drain placements and other therapies such as antibiotics. By identifying a bowel injury prior to surgical closure, the injury can be treated during the incidental operation with minimal morbidity to the patient. Until now, there has been no method to detect unintended bowel injuries during an operation. This is a first in human study to demonstrate that a novel device accurately detects whether bowel is open (perforated) or intact during a laparoscopic surgery. Objective: To evaluate the clinical feasibility of a novel medical device to accurately detect bowel gas, specifically hydrogen and methane, from a sample of gas from the abdominal cavity during laparoscopic surgery when a known bowel wall perforation has occurred. Setting: University (Academic) Hospital

Methods: A prospective single arm study was composed of 8 patients undergoing a standard laparoscopic roux en y gastric bypass. At seven time points during the operation, aliquots of between 150 ml/min and 800 ml/min of intra-abdominal gas were pulled from the abdominal cavity for 45 seconds and analyzed using the novel device for hydrogen (H₂) and methane (CH₄). The time points included: after insufflation (T1), after first jejunotomy (T2), after closure of jejunotomy (T3), after recycle of carbon dioxide gas (T4), after gastrostomy (T5), after jejunotomy (T6), at conclusion of procedure (T7). Gas composition at each time point was analyzed from 30 s after the start of sample collection to 15 s after the end of sample collection, the maximum value for a particular gas during the collection period was identified for analysis.

Results: 8 patients were enrolled in the study; in 7 (87.5%) patients data from all 7 time points was obtained, in 1 (12.5%) patient data from the first 5 time points were obtained. Hydrogen and methane ppm within a gas sample were analyzed at all time points. After the first open of the small bowel (T2) mean hydrogen levels increased to 2.5x compared to hydrogen levels at the initial insufflation (T1) ($p = 0.001$). Hydrogen levels from the first opening of the bowel (T2) compared to the conclusion of the operation (T7) were on average 3x higher ($p = 0.0002$). At all time points there was no significant detection of methane. There were no intraoperative

complications and no post-operative complications during the study.

Conclusion: Hydrogen gas is released into the intra-abdominal cavity when bowel is opened and can be detected in real time using a novel device during laparoscopic surgery. The presence or absence of hydrogen directly correlates to whether the bowel is open (perforated) or intact. This device could be used in the future to detect unintended bowel perforations during laparoscopic surgery, prior to the conclusion of the operation.

A185

Use of a synthetic bioabsorbable tissue scaffold in the closure of the retro-Roux and meso-mesenteric internal hernia spaces during Roux-en-Y divided gastric bypasses leads to a significant reduction of subsequent internal hernia repairs

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Greenville Health System¹ Greenville Health System²

Introduction: Internal hernias are one of the most devastating late, post-surgical complications associated with the Roux-en-Y gastric bypass (RYGB) with a cumulative incidence estimated between 0.2 and 8.6%. Considerable debate on the preferred method of closure has arisen, however, no consensus has been reached and few objective studies exist to guide surgical decision-making. The objective of this study was to determine whether the use of a synthetic bioabsorbable tissue scaffold placed in the retro-Roux space (RR), also known as Petersen's space, and meso-mesenteric (MM) internal hernia space were associated with a decreased post-operative internal hernia rate compared with no closure.

Methods: We conducted a retrospective review of consecutive antecolic RYGB cases performed between 2002 and 2015 at our institution. Prior to September, 2009, the RR internal hernia space was left open during the primary operation and the MM space at the jejunostomy was closed with suture. Beginning in September 2009, all RR and MM internal hernia spaces were reinforced with a synthetic bioabsorbable tissue scaffolding mesh in an effort to generate scar tissue in this location; thereby, preventing future internal herniation of bowel in this location. All internal hernia repairs performed by the minimally invasive surgery service at our institution during the study period were

reviewed to determine the impact of placing the mesh in the internal hernia defects.

Results: A total of 2771 antegastric, antecolic Roux-en-Y divided gastric bypasses (RYGB) were performed at our institution between January 2002 and December 2014 (Table 1). 1215 RYGB were performed without mesh closure of the internal hernia spaces, and beginning in September 2009, 1556 RYGB were performed using bioabsorbable mesh placed in the internal hernia spaces. During the study period, 276 internal hernia repairs were performed by the minimally invasive surgery service. Internal hernia repairs were eventually required in 225/1215 (18.5%) of RYGB patients who did not have mesh closure of the RR and MM spaces. Since September 2009, only 51/1556 (3.28%) of RYGB patients whose internal hernia spaces were closed with bioabsorbable mesh have had subsequent internal hernia repairs.

Discussion: Internal hernias following RYGB are not a rare post-operative surgical finding and may lead to bowel obstructions with devastating consequences if unrecognized. The cost of internal hernia repairs is substantial as compared to the initial cost of mesh implantation in all RYGB patients. The key to internal hernia control is effective prevention. Induction of scar tissue within the RR and MM internal hernia spaces through the use of a synthetic bioabsorbable tissue scaffold is a novel technique associated with a dramatic reduction in the rate of internal hernia formation. This study demonstrates a statistically significant reduction in internal hernia formation in all RYGB cases performed since the addition of bioabsorbable mesh reinforcement to RR and MM defects in 2009 (Figure 1). Although prospective studies are needed, early evidence suggests that reinforcement of the internal hernia spaces with bioabsorbable mesh is an effective method for minimizing internal hernias and their potential complications following RYGB.

A186

Endoscopic sleeve gastropasty with a follow-up time of two years

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Sanchinarro University Hospital¹

Background: Bariatric endoscopic techniques are minimally invasive and induce gastric volume

reduction to treat obesity. The objective is to evaluate endoscopic sleeve gastropasty using a suturing method directed at the greater curvature, perioperative care, two year safety and weight loss outcomes.

Methods: Prospective single-center, study over 154 patients (108 females), using the endoscopic sleeve gastropasty procedure under general anesthesia with overnight inpatient observation. Follow-up was carried out by a multidisciplinary team (nutritionist and psychologist). Study outcomes included change in BMI and % of loss of initial body weight (%TBWL) and adverse effects. Overall patient status, weight data and was collected at baseline, 1 month (n=143), 6 months (n=133), 1 year (n=64) and 2 years (n=28). Voluntary oral contrast and endoscopy studies were scheduled to assess the gastropasty at different times post procedure.

Results: There were no major adverse events and all patients were discharged in less than 24 hours.

Baseline mean BMI was 38.3 \pm 5.5 kg/m², body weight 107.0 \pm 19.1 kg and mean age 44.9 \pm 9.5 (range 23-69) years. All the weight parameters were significantly reduced at 1, 6, 12 and 24 months postprocedure. Mean BMI was 35.5 \pm 5.0 (%TBWL: 7.7 \pm 3.2) at 1 month, 32.0 \pm 4.3 at 6 months (%TBWL: 15.8 \pm 7.1), 31.8 \pm 5.3 (%TBWL: 18.2 \pm 10.1) at 1 year and 30.8 \pm 5.8 (%TBWL: 19.5 \pm 10.5) at 2 years. Better results were obtained in patients with good adherence to follow-up. Oral contrast studies and endoscopy reviews showed a good state of the gastropasty at least until two years of follow-up.

Conclusion: The endoscopic sleeve gastropasty method with good adherence to follow-up, can be considered an effective, safe and well tolerated procedure for the treatments of patients with obesity, at least at two years of follow-up.

POSTERS

A5000

THE IMPACT OF BARIATRIC ERAS PROTOCOL ON PATIENT OUTCOMES

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Background: Multiple specialties including colorectal, vascular, cardiac and orthopedic surgery have demonstrated improved outcomes with the use of ERAS. The aim of the study was to evaluate whether patient outcomes improved (adverse events, hospital length of stay, and readmission rates) following the implementation of our bariatric ERAS protocol.

Methods: The study is a retrospective review using the BOLD and MBSAQIP databases looking at patients who underwent primary bariatric procedures including laparoscopic and robotic gastric banding, sleeve gastrectomy, and gastric bypass before and after ERAS protocol implementation. The pre-ERAS period includes years 2009 to 2011 and the post-ERAS period includes years 2012 to 2015. Adverse events, hospital length of stay, and 30-day readmission rates were compared and trended over time. Adverse events are defined as prolonged hospital stay beyond the expected date of discharge (band > 0.5 days, VSG >1.0 days and Roux-en-Y Gastric Bypass >2 days), all

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cause readmissions within 30 days, or return to the operating room within 30 days. The chi-square test was used to examine the association between time periods (pre/post) and each outcome of interest; namely, adverse events (yes/no) and readmission (yes/no). Additionally, the Cochran-Armitage test was used to examine increasing or decreasing trends in adverse events and readmission rates over time (2009 - 2015).

Results: were considered significant at a significance level of $p < 0.05$. Analyses were conducted using SAS version 9.4 (SAS Institute, Inc., Cary, NC). **RESULTS** There were a total of 1140 patients; 401 (35.18%) 2009 - 2011 (pre) and 739 (64.82%) 2012 - 2015 (post). Adverse events, hospital length of stay, and readmission rates all trended down over time. Adverse events in the post-ERAS period were significantly lower (2.98%) as compared to adverse events in the pre-ERAS period (8.98%, $P < 0.0001$). Readmissions in the post-ERAS period were significantly lower (1.76%) as compared to readmissions in the pre-ERAS period (7.48%, $P < 0.0001$). Additionally, there was a significant decline in adverse events ($P < 0.0001$) and readmissions ($P < 0.0001$) from 2009 - 2015. For gastric bypass patients, length of stay decreased from 4.2 days to 2 days. Average hospital length of stay for gastric band patients decreased from 1.1 days in 2009 to 0.25 in 2015. Sleeve gastrectomy average length of stay decrease from 2.2 to 1.2 days from 2012-2015.

Conclusion: The use of bariatric ERAS protocols has been shown to reduce adverse events and improve patient outcomes following bariatric surgery.

A5001

Bile Reflux Gastritis of the Remnant Stomach Following Roux-en-Y Gastric Bypass: a newly recognized etiology of chronic abdominal pain successfully treated with Remnant Gastrectomy

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Samaritan Health Services¹

Background: Bile reflux gastritis of the disconnected remnant stomach following Roux-en-Y gastric bypass (RNYGB) causing chronic pain has not been reported. We report a series of symptomatic patients with remnant gastritis treated effectively with gastrectomy of the remnant stomach.

Methods: All patients undergoing remnant gastrectomy at a community teaching hospital were retrospectively reviewed for presenting symptoms, diagnostic workup, pathology, complications, and symptom resolution.

Results: Nineteen patients underwent remnant gastrectomy for bile reflux gastritis at a mean of 4.4 years (52.3 months, range 8.5-124 months) after RNYGB. All patients were female and presented with pain, primarily epigastric 18/19 (95%), and burning character 11/19 (58%), with 10/19 (53%) reporting nausea. Endoscopy was performed preoperatively on all patients with successful remnant inspection in 14 (75%), using push endoscopy (n=11) or operative assist (n=3) with 12/14 (86%) biopsy-positive for gastritis. Seventeen (90%) completed a HIDA scan with 100% positivity demonstrating bile reflux across the pylorus. Surgery was laparoscopic in 18 (95%) with hospital LOS of 2.7 days (range 0 to 12 d) with no complications or readmissions. Pathology of the remnant confirmed gastritis in 17/19 (90%). 89% (17/19) of patients reported sustained symptom resolution and 11% (2/19) of patients remained symptomatic at last follow up. We followed all patients for a mean of 6.6 years (1- 194 months).

Conclusion: Bile reflux gastritis of the remnant stomach is a new consideration for chronic abdominal pain months to years following RNYGB. HIDA imaging and endoscopic biopsy are highly suggestive. Remnant gastrectomy is a safe and effective treatment.

A5002

Trends in prevalence of severe obesity and bariatric surgery access: A state level analysis from 2011-2014

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University of Wisconsin¹ Medical College of Wisconsin² Duke University³ Gundersen Health⁴

Introduction: Rates of bariatric surgery in Wisconsin previously have been reported to be similar to the national average (1% of the population with severe obesity). Although bariatric surgery access has anecdotally improved in many parts of the country over the past five years, bariatric programs in Wisconsin continue to experience significant problems with insurance coverage. We sought to describe statewide trends in severe obesity demographics and characterize bariatric surgery volume from 2011-2014.

Methods: Data from the Behavioral Risk Factor Surveillance System (BRFSS), a Centers for Disease Control and Prevention (CDC) annual telephone survey that provides state-level estimates for causes of premature death and morbidity among adults, were analyzed from 2011-2014 for the state of Wisconsin. Overall prevalence estimates of severe obesity (class II and III) were calculated along with severe obesity prevalence estimates according to age group and ethnicity. Odds ratios comparing the likelihood of being severely obese in 2014 versus 2011 were generated within age categories. Bariatric surgery volume data from the Wisconsin Hospital Association for all hospitals in Wisconsin were used to calculate the annual number of bariatric operations per 100 severely obese adults. A 21-question survey was sent to all bariatric surgeons who were members of the Wisconsin state chapter of the American Society for Metabolic and Bariatric Surgery. Survey questions assessed perspectives on bariatric surgery access, insurance coverage, and referral processes.

Results: The overall prevalence of severe obesity in Wisconsin increased by nearly 30% from 2011-2014 (10.4% to 13.2%; $p=0.037$) (Table 1). Severe obesity rates for Black, Hispanic and White adults were 21.7%, 13.9%, and 11.2%, respectively. The odds of severe obesity in 2014 vs. 2011 nearly doubled for adults age 20-39 (OR 1.9, 95% CI 1.3-3.0). The volume of bariatric surgery declined from 1,432 in 2011 to 1,372 in 2014 ($p<0.001$). The number of

laparoscopic Roux-en-Y gastric bypasses declined by 60% from 2011-2014 (1,252 to 721; $p < 0.001$), while laparoscopic vertical sleeve gastrectomy volume increased five-fold (109 to 644; $p < 0.001$). 0.35 per 100 adults with severe obesity underwent bariatric surgery in 2011 vs. 0.26 in 2014. Of the 32 bariatric surgeons who were identified in Wisconsin, 63% completed the survey. Of those, 72% felt that bariatric surgery access had either worsened or remained the same over the last five years.

Conclusion: Severe obesity has rapidly increased in Wisconsin over the past five years, particularly among young adults. Bariatric surgery volume, on the other hand, has remained largely unchanged and is now substantially below the per capita national average. These observations warrant a comprehensive, population-based public health strategy aimed at improving care and access to evidence-based treatment for patients with severe obesity. Similar analyses in other states may offer insight into the extent of bariatric surgery variability throughout the U.S.

A5003

Psychosocial Predictors of Weight Loss and Quality of Life Two Years After Bariatric Surgery: Results from the Toronto Bari-PSYCH Study

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Introduction: Although bariatric surgery is recognized as a durable treatment for severe obesity; however, high rates of psychiatric comorbidity in this patient population have continued to raise questions regarding the impact of psychosocial factors on bariatric surgery outcomes. Existing data on psychosocial predictors of bariatric outcomes have been limited by short follow-up duration and the lack of rigor of psychosocial measures. Therefore, in this prospective study, we aimed to identify psychosocial predictors of quality of life and weight loss two-years post-bariatric surgery.

Methods: Patients referred to the University of Toronto Bariatric Surgery Collaborative were recruited for this study and underwent a series of structured psychiatric assessments consisting of the

MINI International Neuropsychiatric Interview, the Patient Health Questionnaire-9 (PHQ9), the Generalized Anxiety Disorder-7 (GAD7), and the physical and mental component scores of the SF36 for quality of life (QOL). Psychological measures were administered pre-surgery and repeated two years post-surgery. Additional baseline data including pre-surgery weight, sex, age and marital status were collected. Mean difference (MD) scores for the SF36, PHQ9, GAD7 and weight loss were analyzed using t-tests. Multiple linear regression analysis was performed to identify psychosocial and demographic predictors of weight loss and QOL two years post-surgery.

Results: 156 of 214 (73%) patients enrolled in the study completed the 2 year follow-up. Most patients ($n=126$, 81%) were females, 88 (56%) were married or in common-law relationships and the mean distance from the bariatric centre was 132.98 km (SD 172.80). Patients experienced a significant reduction in total weight (MD -48.46 lbs, 95%[-45.59,-51.66]) and a significant improvement in PHQ9 scores (MD -4.37, 95%[-3.00,-5.74]), GAD7 scores (MD -1.30, 95%[-2.44,-0.16]) and physical-SF36 (MD 17.49, 95%[15.83,19.16]) but not mental SF36 scores at 2-years post-bariatric surgery. Multivariate regression analysis identified higher pre-surgery weight ($p < 0.001$), male gender ($p = 0.01$), being single ($p = 0.01$), a history of a mood disorder ($p = 0.03$), and a history of an anxiety disorder ($p = 0.03$) as significant predictors of higher weight at 2-years post-surgery (see Table 1). Although no variables significantly predicted mental QOL, two-year post-surgery physical QOL was significantly predicted by pre-surgery physical QOL ($p < 0.001$), younger age ($p = 0.003$) and married or common-law ($p = 0.04$).

Discussion: In summary, this prospective study identified several pre-surgery predictors of weight loss at 2 years post-surgery that reflect previous literature. Our study found a significant association between a past history of an anxiety disorder and higher weight at 2-years post-surgery while a history of a mood disorder was associated with lower weight (greater weight loss) 2-years after surgery. It is possible that anxiety disorder may be exacerbated after surgery and impact adherence to post-surgery diet regimen. Possible explanations for greater weight loss in patients with mood disorders include greater insight into mental health issues as a result of prior difficulties with their mood and mental health support that continued post-surgery, which has been found to be beneficial to post-surgery outcomes. Only higher physical QOL was predicted

by the following demographic variables: pre-surgery QOL, younger age and married or common-law status. Future research should examine mental health service use, additional psychosocial predictors and outcomes beyond 2 years after bariatric surgery.

A5004

STOPBANG score and capillary bicarbonate levels – possible screening tool for OSA in patients with obesity undergoing bariatric surgery?

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Introduction: Obstructive sleep apnoea (OSA) is known to be highly prevalent in patients with obesity undergoing bariatric surgery. The benefit of routine OSA screening as part of preoperative work up in every patient is doubtful and increases the cost with no definite tangible benefits. Hence, there have been attempts to streamline referral of these patients for polysomnography with a view to optimise the preoperative workup.

Methods: A retrospective review of patients with significant symptoms associated with sleep apnoea admitted for bariatric surgery over a two year period was undertaken. Data including patient demographics, STOPBANG score for risk of obstructive sleep apnoea (OSA), capillary blood gas analysis (Bicarbonate, PaCO₂, PaO₂) and Apnoeic-Hypopneic Index (AHI) based on polysomnography was analysed. Patients below a STOPBANG score of 3 were excluded. Statistical analysis was done using Microsoft Excel (Real Statistics: Data Analysis Tools).

Results: 50 patients (M;F = 15:35) with a mean BMI of 49.9 (sd+-8.7) were included. 38/50 patients had OSA confirmed by polysomnography and were commenced on CPAP. OSA was excluded in 12/50 patients on the basis of polysomnography (non-OSA). The 38/50 patients with confirmed OSA had a mean STOPBANG score of 5.4 (sd+-1.3) compared to 4.3 (sd+-1.8) in the non-OSA group. On the capillary blood gas analysis, the mean PaO₂ in confirmed OSA vs non-OSA was 9.31kPa vs 9.25kPa (p=0.88 [95%CI: -0.77-0.89]; independent t-test) and the PaCO₂ between confirmed OSA vs non-OSA was 5.37kPa vs

5.23kPa (p=0.40 [95% CI: -0.20-0.49]; independent t-test). But crucially, the mean bicarbonate levels in the confirmed OSA vs non-OSA groups were 26.04 vs 24.78 (p=0.05 [95% CI: -0.01-2.5]; independent t-test), thereby approaching statistical significance. As expected, the mean AHI between confirmed OSA vs Non-OSA was 37.7 vs 5.3 (p<0.0001 [95%CI: 18.1-46.8], independent t-test) and this was statistically significant.

Conclusion: The role of routine polysomnography in all patients with obesity undergoing bariatric surgery is not clear. Bicarbonate levels in a capillary blood gas analysis along with a STOPBANG score of 5 and above may help in screening these complicated group of patients before subjecting them to polysomnography in an attempt to detect OSA before surgery.

A5005

FIRST COMPARATIVE STUDY BETWEEN SLEEVE GASTRECTOMY, LAPAROSCOPIC GREATER CURVATURE PPLICATION AND ENDOSCOPIC PPLICATED GASTROPLASTY

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Background: Restrictive procedures are an excellent option for patients with lower BMI. New procedures in this area, both surgical and endoscopic, have widened the bariatric armamentarium with less invasive choices. This study compares sleeve gastrectomy, laparoscopic and endoscopic gastric plication.

Methods: We retrospectively reviewed operated patients for Sleeve Gastrectomy (SG), Laparoscopic Greater Curvature Plication (LGCP) and Endoscopic Gastric Plication (EGP) from 4 different Centers. SG was constructed over a 36F bougie with 4 to 6 staplers. LGCP was performed also over a 36F bougie with 2 layers of continuous non-absorbable sutures from Hiss to Antrum. EGP was constructed with an average of 6 sutures with 6 stiches each (including anterior wall, greater curvature and posterior wall). We compared patients with BMI up to 45kg/m². Multicenter, retrospective comparative study of efficacy at 6 and 12 months follow-up, and safety

(morbidity and mortality) of each technique in patients with BMI 30-39.9 kg/m²; and BMI 40 to 45kg/m².

Results: 173 patients (69 EGP, 38 LGCP and 66 SG) with a mean BMI of 39.48, 39.95 and 40.23kg/m² respectively. The BMI<40 group included 89 patients (48 EPG, 17 LGCP and 24 SG) with respective initial average BMI of 36.4, 38.3 and 37.5 kg/m²; At 12 months: TBWL: 19.8, 25.3 and 24.4 kg; %EWL 60.6, 64.4 and 76.1%; TBMIL: 7.2, 9.4 and 9.0 kg/m²; without statistically significant differences. Hospitalization: EPG: 1 day. TPG and VG: 3 days. Major complications: EPG: 0%. TPG: 6% (1 reoperation). SG: 4% (1 reoperation).The BMI 40 to 45 group included 84 patients (21 EGP, 21 LGCP and 42 SG) with a mean BMI of 41.88, 42.25 and 42.47kg/m². At 12 months: EWL: 45.86, 64.39 and 67.30%; TBWL: 21.28; 30.01 and 31.40kg and TBMIL 8.89, 12.80 and 13.38kg/m². All parameters showed statistical significance favoring the surgical group. Hospital stay was also 1 day for EGP and 3 days for surgical group. Morbidity was 0 for the endoscopic group and 4 patients of SG and 3 for the LGCP group. 2 patients after SG had to be reoperated and 2 in the LGCP group. Mortality was 0 in the whole series.

Conclusions: All these restrictive procedures achieve good weight loss in these group of patients. Endoscopic gastric plication showed the same results after 1 year than the surgical groups, but when initial BMI grows up to 45, the surgical group is better. Morbidity and hospital stay are better in the endoscopic procedures.

A5006

Efficacy of IV Acetaminophen in Laparoscopic Roux-en-Y Gastric Bypass Surgery Patients

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Introduction: Opiate based pain medications used during surgery have been shown to increase post-operative nausea and vomiting (PONV) and delay recovery of bowel function. This effect can result in an increased length of stay for patients undergoing Laparoscopic Roux-en-Y Gastric Bypass (LRYGB). Multiple studies in other surgical fields have shown that non-narcotic based pain management with IV acetaminophen protocols can reduce length of stay. However, this intervention has never been studied for length of stay in the post surgical bariatric population.

Methods: Over a continuous period from 2011 to 2013 patients undergoing LRYGB were enrolled in a double blind placebo controlled trial. Patients were randomized to receive IV Acetaminophen preoperatively and for 30 hours post operatively (Group 1) or to a saline placebo (Group 2). All patients were provided on demand IV Hydromorphone as well as oral opiate based medications and rescue nausea medications. Primary outcome measure was length of stay. Secondary outcomes included; evaluation of pain and nausea scores, nausea medication usage, as well as time to return of flatus.

Results: A total of 110 patients underwent randomization for this study. 99 Patients were included for analysis, 45 patients in the treatment and 44 patients in placebo. The treatment group was found to have a decrease in the length of stay of 2.72 days vs 3.178 days in placebo (p value 0.03). The return of flatus was found to be 1.87 days for the treatment and 2.24 days for the placebo (p value 0.04.) No difference was found in the use of hydromorphone of 6.34 mg (Group 1) vs 6.76 mg (Group 2) (P value 0.64) over a 30 hour post-operative period. Also no difference was seen in the post-operative nausea scores between treatment groups as well as no difference in overall use of nausea medications.

Conclusion:The use of IV Acetaminophen in LRYGB results in a decrease in the length of stay with a more rapid return of bowel function. However, there is no change in the amount of post-operative opiate use or nausea medications required. Authors: Lange, Matthew Lee, Christina Perla Subbaigh Kia, Michael.

A5007

12 Month Satiety Changes in a Randomized Controlled Multicenter Study of an Incisionless Operating Platform for Primary Obesity (pose procedure™) vs. Diet-Exercise Alone: The MILEPOST Study

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Background: The *pose™ procedure* is a minimally invasive technique which uses the *g-Cath™ EZ Suture Anchor*, part of the *Incisionless Operating Platform™* (USGI

Medical, San Clemente, CA, USA) to treat patients with Class I and II obesity. During the endoscopic procedure, full-thickness plications are placed in the gastric fundus and distal body to modify gastric capacity and function. The effect of these full thickness plications is believed to reduce fundal accommodation, accelerate the passage of food from fundus to antrum, and alter antral motility, thus slowing total gastric emptying. As a result of these targeted plications, the patient experiences a feeling of fullness sooner and stays full longer. The purpose of this study was to compare safety, satiety, and weight loss outcomes of subjects undergoing *pose* diet and exercise to those following diet and exercise alone. Satiety testing results at 12 months post procedure are reported.

Methods: A prospective, multi site, open label, randomized controlled trial was conducted in 3 EU countries. Following Ethics approval, 44 patients with class I-II obesity were randomized in a 3: 1 ratio (*pose* with diet and exercise counseling: diet and exercise counseling only [control]). Satiety testing was performed at baseline and at 2, 6, and 12 months in both the Control and Treatment groups. After an overnight fast of at least 8 hours, subjects are asked to ingest a nutrient liquid meal (Isosource Energy 1,5 kcal/mL) at rate of 15 mL/min until the participant's maximum satiety was reached. Before starting the test and at 5 min intervals, patients were asked to evaluate the following symptoms: satiety, nausea, bloating in the upper abdomen, and pain in the upper abdomen. Symptoms were assessed using a visual analogue scale from 0 to 10. Participants were instructed to stop their liquid meal intake when they reached a score of 10 in satiety. The total ingested volume to this point defined maximum tolerated ingestion (MTI).

Results: Between November 2013 and July 2014, 44 patients were randomized (77.3% female; mean age 38.3±10.7 years; body mass index, 36.5±3.4 kg/m²) to *pose* (n=34) or control (n=10) in 3 centers. At 12 months (n=22), *pose* patients showed a statistically significant reduction in intake capacity (meal size) compared to baseline (p=.000); controls (n=8) did not experience a statistically significant reduction in intake capacity p=.094) compared to baseline. In addition, the *pose* procedure group presented a 53% quicker time to reach satiety 12 months following the procedure (p=.000) versus only a 32% reduction in the diet and exercise group at the same time point (p=.101).

Conclusions: In conclusion, the MILEPOST data provides additional evidence to support that the

pose procedure results in both a clinically and statistically significant treatment for patients suffering from Class I and Class II obesity versus diet and exercise alone. Changes in post *pose* procedure satiation (capacity and time to fullness) were significant through 12 months, which was not observed in the diet and exercise group.

A5008

Patient travel for bariatric surgery: Does distance matter?

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Introduction: Increasingly, patients are faced with farther travel distances to undergo bariatric surgery at high volume centers. This study sought to evaluate the impact of travel distance on access to care and outcomes following bariatric surgery.

Methods: Patients who underwent Roux-en-Y gastric bypass (RYGB) at a single institution between 1985-2004 were examined. Only cases with complete follow up a minimum of 10 years after surgery were included. Cases were stratified by patient travel distance to the medical center where they underwent surgery, with 'local' defined as <1 hour travel time and 'distant' defined as >1 hour travel time. Univariate analyses were performed for preoperative risk factors, 30-day complications, and long-term (10-year) weight loss following surgery. Kaplan-Meier survival analysis was performed to compare local and distant patients.

Results: Complete long-term follow up was available in 650 (57%) patients who underwent RYGB. Among these patients, 316 (48.6%) traveled <1 hour to undergo surgery, and 334 (51.4%) traveled >1 hour. Median BMI (kg/m²) among the groups was equivalent (52.9 local, 53.2 distant, p=0.76). Patients who traveled longer distances had higher rates of preoperative comorbidity, including COPD, CHF, DM, and sleep apnea (all p<0.05). Complications within 30 days of surgery and long-term reduction of excess BMI were equal between groups at 59.9% (p= 0.99). Local patients were more likely to adhere to yearly follow-up with their surgeon compared with patients who traveled a greater distance for surgery (27.9% local, 18.9% distant, p=0.001). Of note, there was no

difference in rate of private insurance between the groups (58.9 local, 63.1 distant, $p=0.25$). Unadjusted long-term survival was found to be superior ($p=0.002$) in the local group as illustrated in Figure 1.

Conclusions: A majority of patients who underwent bariatric surgery at our center traveled more than one hour. When compared with local patients, distant patients had more preoperative medical comorbidities. Despite longer travel time for care, 30-day complications and long-term weight loss were equivalent compared to local patients. As expected, patients who live in close proximity were more likely to adhere to yearly follow up in surgery clinic. Interestingly, a long-term survival benefit was observed in patients who reside within one hour of our medical center.

A5009

Laparoscopic Adjustable Gastric Band Colonization Indicates Re-Classification of Surgical Wounds

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Background: Surgical wounds are classified as either clean, clean-contaminated, contaminated, or dirty wounds. Historically laparoscopic adjustable gastric band (LAGB) removals have been classified as clean wounds since there is thought to be no existing infection and no transection of the gastrointestinal tract. Surgical site infection (SSI) remains a publicly reported source of morbidity after laparoscopic bariatric surgery and is considered a CMS Hospital Acquired Condition. We present a retrospective chart review to reveal the rate of bacterial colonization of what is thought to be a sterile gastric band.

Methods: This retrospective chart review included 14 patients who underwent removal of LAGB from August 2015 to March 2016. The entire LAGB and port were removed. Both the port and band were sent for aerobic and anaerobic cultures. Patients were followed up to one month and incidence of surgical site infection (SSI) development was recorded.

Results: Of the 14 LAGBs cultured, six cases (43%) returned positive for bacterial growth. Four of the cultures (31%) were positive for coagulase negative staphylococcus *sp.* One culture was positive for micrococcus species (18%) and another was positive for propionibacterium (18%). None of the 14

patients followed in the study developed an SSI by the end of one month.

Conclusion: Given the consideration of LAGB as clean wounds, the incidence of LAGB colonization is high. Classification of the surgical wounds in LAGB removals should be changed from clean to clean-contaminated. Further studies need to be pursued to determine the correlation between colonized LAGBs and the rate of SSIs.

A5010

Reversal of Roux-en-y gastric bypass at a tertiary center with a large experience in laparoscopic gastric bypass revision: indications and outcomes.

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Introduction: No large single institution experience in reversal of Roux-en-y gastric bypass (RYGB) to normal anatomy has been previously published. Most published series are small, suggesting that bariatric surgeons may reserve reversal to normal anatomy for rare situations, perhaps due to concern about a high risk for surgical complications. We have been fairly aggressive at recommending reversal to normal anatomy for patients with a variety of chronic serious complications after RYGB. In this report, we describe our large experience with laparoscopic reversal of RYGB over 4 years, our indications for reversal and our post-operative outcomes. The goal of our study is to advance understanding of how reversal to normal anatomy may be applied after previous RYGB, to further define the risks of complications and to identify factors that would prevent the need for reversal.

Method: A retrospective review of all patients who underwent laparoscopic reversal of gastric bypass at our institution between March 2012 and February 2016.

Results: During this 4 year period, our institution performed 2,009 primary laparoscopic gastric bypass procedures. In addition, we performed a large number of revisions of previous RYGB (n=449) for a variety of issues. Revisions of previous RYGB included 48 patients after RYGB who underwent

reversal to normal anatomy (10.7% of RYGB revisions). Our program can be characterized as a referral center that provides assistance to patients who had their index procedures done elsewhere. Of the 449 total RYGB revisions, 54% of the index procedures were done by another institution. In the reversal subgroup, a higher proportion (71%, n=34) had their primary procedure done by another program. Patients undergoing laparoscopic reversal were between 23 and 72 years of age (mean 48.6 ± 12 years). 96% of the reversal group were female and only 2 males underwent reversal. The interval from index RYGB operation to reversal was 3 months to 25 years (mean 9.4 ± 5.6 years). Indications for reversal included chronic recurrent marginal ulcer (48%), malnutrition (45%), chronic pain and nausea (12%), and reactive hypoglycemia (10%). 8 patients were reversed due to a combination of malnutrition and symptomatic marginal ulcer. Three of our 2,900 primary patients (0.1%) were treated by reversal to normal anatomy within 6 months following RYGB. Each of these struggled early with complications after the primary procedure, but were ultimately deemed to have resolution of the early complication. Thus, psychological intolerance was deemed the primary reason for reversal in this small subgroup with early reversal. The operative time for laparoscopic reversal was 46 to 485 minutes (mean 129.8 minutes). Reversal carried significant morbidity, as 29% of patients experienced a complication within 30 days. Follow up was available between 9 days and 3 years after reversal with an average follow up period of 1 year. The most common complications were sepsis (10.4%), bleeding requiring transfusion or re-operation (8.4%), gastrointestinal leak (6.3%), deep venous thrombosis (4.2%), and obstruction (2.1%). Despite the high rate of morbidity, no mortality occurred during 30 days follow up after reversal. There were two late deaths beyond 30 days (4.2%) for unknown causes. Within 30 days of reversal, re-operation was undertaken for complications in 14% and 3 additional patients (6.3%) underwent upper endoscopy. Length of stay was between 1 and 50 days (average 8.1 ± 9.2 days). Readmission following hospital discharge occurred in 27%. **Discussion:** The data suggest that reversal of RYGB is a high risk procedure, even at a center with a large experience in RYGB revision. Reversal to normal anatomy was characterized by high morbidity including major complications of sepsis, bleeding and leaks, as well as high risk for re-operation and post-discharge re-admission. Despite the high risks

for surgical complications, there were two late mortalities that occurred for unknown reasons in this large single institution series. We conclude that, although reversal of RYGB to normal anatomy has a role in treatment of patients with persistent serious complications of RYGB, it should be undertaken by surgeons with a large experience in RYGB revision. A notable subgroup had psychological intolerance as an indication for early reversal (< 6 months after RYGB), which occurred in only 0.1% of primary procedures and was successfully treated by reversal to normal anatomy.

A5011

Intra-gastric Balloon Insertion as a prelude to definitive Bariatric Surgery in Super Obesity: A Sixteen-year Single Institution Experience

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Background: Intra-gastric balloons are designed to support weight loss through gastric restriction to achieve mechanical satiety. They are being increasingly utilised in bariatric pathways in conjunction with established metabolic surgical approaches. Our aim was to evaluate the efficacy of these devices in our bariatric unit based within a city centre teaching hospital over a sixteen-year period. **Methods:** Prospective data was collected on consecutive super-obese patients undergoing intra-gastric balloon insertion, and evaluated retrospectively. Patients underwent intra-gastric balloon with subsequent definitive surgical therapy by (i) adjustable gastric band, (ii) Sleeve Gastrectomy and (iii) Roux-en-Y Gastric Bypass. All intra-gastric balloons were removed before the definitive procedure. An additional group (iv) of intra-gastric balloon insertion alone without definitive surgery (due to medical contraindications) were also studied. Patients were followed up for 60 months. Intra-gastric balloon outcomes were studied at 12months, 24months and 60months.

Results: Two hundred and seven patients underwent intra-gastric balloon (ORBERA) placement at esophagogastroduodenoscopy from January 2000 to February 2016. 129 females and 78 males had a mean age 44.5 (+-11.3) and a mean body mass index (BMI) of 57.3Kg/m² (+-9.7). 58% of subjects suffered from Type 2 diabetes mellitus. Time from initial or first balloon insertion to definitive surgical therapy ranged between 9-13 months. 76 patients had intra-gastric balloon alone and 131 had intra-gastric balloon followed by definitive procedure (80 patients had gastric bypass or sleeve gastrectomy). At 12months, 24months and 60months post-operatively the Balloon alone (without definitive surgery) demonstrated an Excess Weight Loss (EWL) of 17.55% (ΔBMI -6.14), 17.23% (ΔBMI -6.78) and 9.04% (ΔBMI -3.8). Balloon and definitive stapled procedure (gastric bypass or sleeve gastrectomy) demonstrated an EWL of 35% (ΔBMI -13.0), 51.6% (ΔBMI -19.2) and 52.8% (ΔBMI -17.6). Weight loss results of intra-gastric balloon followed by each definitive procedure included: Balloon and gastric banding with an EWL of 22.9% (ΔBMI -7.0), 26.2% (ΔBMI -8.0) and 32.9% (ΔBMI -8.9). Balloon and sleeve gastrectomy with an EWL of 31.6% (ΔBMI -12.6), 47.1% (ΔBMI -22.2) and 39.9% (ΔBMI -14.1). Balloon and gastric bypass with an EWL of 35.9% (ΔBMI -12.5), 53.8% (ΔBMI -18.5) and 56.0% (ΔBMI -18.7). Overall there were 3 deaths (1.4%), Two within 10 days due to acute gastric perforation secondary to vomiting and one cardiac arrest at 4 weeks post-operatively.

Conclusion: Intra-gastric balloons can offer effective weight loss in selected super-obese patients within a dedicated bariatric centre offering multidisciplinary support. Balloon insertion alone offers only short-term weight loss, however when combined with definite bariatric surgical approaches durable weight loss outcomes can be achieved. Surgeon and unit experience with intra-gastric balloons can contribute to 'kick starting' successful weight loss within an established bariatric surgical pathway.

A5012

A Retrospective Comparison of Roux-en-Y Duodenal Switch with Single Anastomosis Duodenal Switch (SIPS-Stomach Intestinal Pylorus Sparing Surgery) at a Single Institution with Two Year Follow-Up

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Background: The traditional duodenal switch is performed using a Roux-en-Y configuration. This procedure has proven to be the most effective long term weight loss and comorbidity reduction technique. Recently, stomach intestinal pylorus sparing surgery (SIPS) has been introduced as a simpler and potentially safer variation of the duodenal switch (DS). It is a single anastomosis end-to-side proximal duodeno-ileal bypass with a sleeve gastrectomy (Fig. 1). In this study we compare our outcomes at two years between Roux-en-Y duodenal switch (RYDS) and SIPS at two years.

Setting: This is a retrospective analysis from a single surgeon at a single private institution.

Methods: We analyzed data from 182 patients retrospectively, 62 patients underwent RYDS while 120 other patients underwent SIPS between Sept. 2011 and Mar. 2015. A subset analysis was performed comparing data from both procedures to evaluate weight loss and complications.

Results: Of 182 patients, 156 patients were beyond 1 year postoperative mark and 99 patients were beyond 2 year postoperative mark. Five patients lost to follow-up. None of our patients had complications resulting in death. RYDS and SIPS had statistically similar weight loss at 3 months but percent excess weight loss (%EWL) was more with RYDS than SIPS at 6, 9, 12, 18, and 24 months. Patient lost a mean body mass index (BMI) of 23.3 (follow-up: 69%) and 20.3 kg/m² (follow-up: 71%) at two years from the RYDS and SIPS surgery, respectively. However, operative time, length of stay, perioperative, and postoperative complications were significantly fewer with SIPS than RYDS ($P = <0.001$) (Tab. 1).

Interestingly, even though RYDS patients lost slightly more weight, the actual final BMI of both groups is statistically identical (26.9 vs 25.6). There was no statistical difference between two groups for post-operative nutritional data such as vitamins D, B1, B12, serum calcium, fasting blood glucose, HbA1c, insulin, serum albumin, serum total protein and lipid panel.

Conclusion: SIPS is a simplified DS procedure. The SIPS eliminates one anastomosis and has fewer perioperative and postoperative complications when compared to RYDS. Although %EWL is greater with

RYDS, the ending BMI calculations at two years are similar.

A5013

Intestinal glucose transporters GLUT-1 and GLUT-5 expression in obese and non-obese subjects and potential impact on Type 2 diabetes remission following bariatric surgery

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Introduction: The profound impact of bariatric surgery on weight loss and co-morbidity resolution is well established¹. Prospective randomized studies confirm the superiority of RYGB over medical therapy for the management of obesity-associated type 2 diabetes mellitus (T2DM)². Improved glucose homeostasis often occurs early after RYGB-before any appreciable weight loss³. The mechanism underlying the remission of T2DM following RYGB is complex and poorly understood. Intestinal remodeling may play a crucial role. An important study demonstrated morphological adaptation of the Roux limb in association with reprogramming of intestinal glucose metabolism. Gene and protein expression of glucose transporter 1 (GLUT-1) was shown to be up-regulated in the Roux limb of obese rats undergoing RYGB. This was associated with an enhancement in intestinal glucose uptake and utilization⁴. This phenomenon has yet to be shown in humans undergoing RYGB but is being studied. Glucose transporter-5 (GLUT-5) is a facultative fructose transporter found in the intestine, muscle, and adipose tissue identified as a possible mediator of metabolism and insulin resistance⁵. GLUT-5 levels are decreased in adipose tissue samples of obese and insulin resistant rats compared to non-obese rodents⁶. The aim of this study was to compare the levels of glucose transporter expression in subjects with obesity versus non-obese subjects.

Understanding the pattern of baseline intestinal expression of these glucose transporters will provide a basis for interpreting morphological changes observed in the Roux limb following RYGB and the impact on glucose metabolism.

Methods:Tissue samples were collected from 5 adult (age ≥ 18) patients with morbid obesity undergoing elective RYGB for weight loss. Samples of jejunum were obtained from the excess tissue removed during the stapled jejuno-jejunal anastomosis. All subjects met National Institutes of Health (NIH)

criteria for bariatric surgery (Body Mass Index or BMI ≥ 40 or ≥ 35 with obesity related comorbidities). Exclusion criteria for this group included age less than 18, age greater than 65, patients undergoing a revision from a prior bariatric surgery to RYGB, and presence of a seizure disorder (GLUT-1 deficiency syndrome). Four control jejunal tissue samples were obtained from non-obese subjects (average BMI 26.7) and without diabetes who were consenting organ donors after death by brain death. Samples of the control jejunum were obtained approximately 30cm distal to the ligament of Treitz during procurement of other intra-abdominal organs. Institutional Review Board (IRB) and the Gift of Hope approval was obtained. All specimens underwent quantitative real-time PCR, Western blotting, histology, immunohistochemistry, and ELISA. Western blot densitometry was performed using Image J software. Student T-test was performed using SPSS statistics software.

Results:GLUT-1 expression was not detected in the jejunum from subjects with obesity or in the control group. The Western blot band density of GLUT-5 to loading control (GADPH) ratio was 0.21 (SD=0.20) in the specimens from obese patients compared to 0.56 (SD=0.17) in the non-obese. Densitometry revealed GLUT-5 protein levels in the jejunum of subjects with obesity were significantly lower than in the control specimens ($p < 0.05$).

Conclusion:The absence of GLUT-1 expression in both the obese and non-obese groups is consistent with the established view of GLUT-1, abundantly present in fetal small intestine where it is important for tissue growth, but diminished to barely detectable levels in adult intestine. The decreased expression of GLUT-5 in the samples from subjects with obesity compared to samples from non-obese individuals may represent the down-regulation of gene expression for GLUT-5 in populations with obesity. The differential expression of GLUT-5 observed in obese versus non-obese subjects suggests a role in obesity and obesity-associated insulin resistance. Moreover, studies examining glucose transporter expression following RYGB will aid in further understanding the impact of intestinal remodeling on post-operative glucose homeostasis. References:1. Colquitt JL, Pickett K, Loveman E, Frampton GK. Surgery for weight loss in adults. *Cochrane Database Syst Rev.* 2014;8(8): CD003641. doi: 10.1002/14651858.CD003641.pub4.2. Schauer PR, Kashyap SR, Wolski K, et al. Bariatric surgery versus intensive medical therapy in obese patients with diabetes. *N Engl J Med* 2012; 366(17):1567-

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A5014

Heart rate patterns and prediction of postoperative complications during the first 48 hours after bariatric surgery

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Background: Complications after bariatric surgery have been described around 9-19% and mortality rate shouldn't exceed 1%, with an 'acceptable' rate of 0.1-0.5%. Early detection and correct treatment of potentially catastrophic complications continues to be the milestone in these types of surgeries. In patients with obesity, symptoms related to abdominal complications can pass undiagnosed, but variations in vital signs (e.g. heart rate, blood pressure and oxygenation) could be the first manifestation of severe complications.

Methods: A prospective study was performed with every patient submitted to bariatric surgery at a single institution from October 2012 to march 2015. A record of their vital signs (heart rate, blood pressure, oxygen saturation and temperature), postoperative fluid balance (urine and drain output) and postoperative pain (Visual Analog Scale) were performed (before surgery, 6-10, 24 and 48 hours

after surgery). A record of complications occurring during the first 48 hours was also performed. The primary objective was to determinate early variations in heart rate for those patients presenting further complications within the first 48 hours after surgery. Secondly an analysis of other vital signs, fluids output and pain was performed to established their relation with complications and heart rate. Inclusion criteria were: Patients submitted to Laparoscopic Gastric Bypass and Sleeve gastrectomy with complete data collection sheets. Exclusion criteria were patients with incomplete charts, revisional surgery, open surgery or converted to open, usage of beta-blockers for hypertension, usage of dexmedetomidine during anesthesia, patients with any arrhythmia and/or taking diltiazem, verapamil or inotropics.

Results: In a 29 months period, 291 patients were submitted to bariatric surgery. Nineteen were excluded because incomplete charts or dexmedetomidine use, and 13 because were taking beta-blockers. The final analysis was performed in 259 patients (79.9% female sex with a median age of 39 years) presenting an initial mean BMI of 40.3 kg/m². The rest of the initial demographic characteristics can be observed in Table 1. There were 26 complications (10%) during the first month, but only 10 (3.8%) occurred during the first 48 hours. Seven presented bleeding (5 with gastrointestinal bleeding being evident 24 hours after the procedure and 2 with postoperative surgical bleeding) and 3 atelectasis. Baseline analysis of vital signs for patients with and without complications was homogeneous. There was a significant difference in heart rate between patients with complications and without complications (overall and those with bleeding) starting 6-10 hours after the surgery and at 24 and 48 hours. (Table 2/Figure 1 and 2). Such variations occurred before any other vital sign was altered and also before any symptom appeared. **Conclusion:** There is an early rise (in the first hours after the procedure) in the heart rate of patients that will develop a complication within the next 48 hours, especially in those with gastrointestinal bleeding; such variation remains persistent during the complete follow-up. These findings could help to predict complications before their clinical onset and start a prompt treatment.

A5015

Weight loss outcomes in patients with Stomach Intestinal Pylorus Sparing surgery at 3 years

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Background: Over the last 20 years the duodenal switch (DS) has proven to be a very effective weight loss procedure. However, we were unsatisfied with the nutritional deficiencies and the diarrhea. We have been performing a modification of the DS we call SIPS (Stomach and intestinal pylorus sparing surgery) since 2013. This technique eliminates the Roux limb in favor of a single anastomosis duodenal ileostomy, lengthens the common channel to 3 meters and does the sleeve over a 40 french bougie (figure 1). Using this configuration we hoped to maintain the current excellent weight loss while eliminating the internal hernias and ulcers associated with regular DS and drastically reduce the incidence of diarrhea and vitamin deficiencies.

Objective: Retrospectively review weight loss outcomes with SIPS at 3 years.

Methods: Data from all patients who underwent a primary SIPS procedure performed by one surgeon at a single institute from 2013 to 2016 were retrospectively analyzed. All revisions of prior bariatric procedures were excluded. Regression analyses were performed for all follow-up weight loss data.

Results: There were 291 patients in our database. Of these 131 were beyond one year, 67 were beyond 2 and 28 were beyond three years (see weight loss through time on table 1). At 3 years, patients had an average change in body mass index (BMI) of 19.7 +/- 8.46 units with 93.3 +/- 32.5% Excess weight loss (EWL). More importantly there were no complaints of diarrhea and every patient had lost >50% EWL at three years with minimal weight regain.

Conclusion: In our cohort, modification of the classic DS to SIPS had equal long term weight loss to a standard DS while maintaining significantly better weight loss and fewer complications than both in historic controls of Sleeve and Gastric Bypass.

A5016

Laparoscopic Gastric Bypass is Associated with Improved Renal Function in Patients with Stage III Chronic Kidney Disease

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Background: The global health crisis of morbid obesity has been well established and demands appropriate therapies. Another alarming global health trend is the increasing rate of chronic kidney disease (CKD). Roux-en-Y gastric bypass has been demonstrated in numerous randomized controlled trials to be a safe and durable therapy for managing patients suffering from morbid obesity and associated comorbidities such as type 2 diabetes mellitus and hypertension. However, the optimal therapy for patients with both morbid obesity and CKD has not been adequately investigated. Our aims were to assess the effectiveness, postoperative trajectories of excess body weight (EBW) and renal function, and safety in patients with stage III and IV CKD undergoing laparoscopic Roux-en-Y gastric bypass (LRYGB).

Methods: A retrospective analysis of patients with CKD, not on dialysis, who underwent LRYGB between January 2008 and October 2014 was performed. Patients were stratified by CKD stage based on preoperative glomerular filtration rate (GFR) as estimated by the Modification of Diet in Renal Disease study equation: stage III (GFR 30-59 mL/min/1.73m²) or stage IV (GFR <30 mL/min/1.73m²). Data were analyzed using summary statistics, and linear mixed effects models tested the trajectories of excess body weight (EBW) and GFR, and whether they differed between CKD groups.

Results: The sample included twenty-four adults (age 41-69 57+-9yrs, 16 67% female, 21 88% Caucasian, 75% with stage III CKD). Longitudinal analyses included 261 data points (168 stage III, 93 stage IV) and total patient follow-up averaged 27+-16 months (range 4-63). Preoperative body mass index averaged 49+-9 (range 36-73) and did not differ by CKD group (p=0.784). EBW declined significantly over time (p<0.001), with an average reduction of 56+-19% at month 12, and the trajectory of weight loss did not differ by CKD stage (time by group interaction p=0.123). After adjusting for the negative effect of EBW on GFR (p=0.001), the trajectory of GFR differed between the CKD groups (p<0.001) [Figure 1]. Overall GFR improved over time (p=0.024) in patients with stage III CKD and it deteriorated (p<0.001) in patients with stage IV disease. Postoperative complications included two early minor events (superficial surgical site infection, pneumonia) and three early major events (post-op

hemorrhage requiring transfusion, acute renal failure requiring dialysis, postoperative myocardial infarction). Late minor complications included three patients diagnosed with marginal ulcers. Two stage IV patients progressed to hemodialysis at postoperative months 18 and 42 and one with stage III CKD died of unknown causes at month 40.

Conclusion: LRYGB is effective and is associated with improved renal function in patients with stage III CKD. These data suggest that GBP prior to deterioration to stage IV CKD is beneficial in patients with progressing chronic kidney disease. Careful postoperative management is required in patients with CKD as complication rates may be higher than anticipated due to an increased number of comorbidities in this population. Long term follow-up as well as prospective data in a larger sample are needed to better assess postoperative renal function in patients with CKD undergoing LRYGB.

A5017

A Site-Specific Approach to Reducing ED Visits Following Bariatric Surgery

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Background: Many emergency department (ED) visits following bariatric surgery do not result in readmission and may be preventable. Little research exists evaluating the efficacy of perioperative measures aimed at reducing ED visits in this population. Therefore, understanding the driving factors, such as patient and hospital characteristics, behind these preventable ED visits may be a fruitful approach to prevention. Furthermore, evaluating the efficacy of current perioperative measures may shed light on how to achieve meaningful reductions in ED visits.

Methods: We studied 48,035 eligible patients who underwent bariatric surgery at across 37 Michigan Bariatric Surgical Collaborative (MBSC) sites between January 2012 and October 2015. Hospitals were ranked according to their risk-and reliability-adjusted ED visit rates. For hospitals in each ED visit rate tercile, several patient, surgery and hospital summary characteristics were compared. We then studied whether a hospital's compliance with specific perioperative measures was significantly associated with reduced ED visit rates.

Results: We found that only three of the 30 surgery, hospital, and patient summary characteristics studied were significant predictors of a hospital's ED visit rate: rate of sleeve gastrectomies, rate of readmissions, and rate of VTE complications ($p=0.04$, $p=0.0065$ and $p=0.0047$, respectively). Also, a hospital's compliance with the perioperative measures evaluated was not a significant predictor of ED visit rates ($p=.12$).

Conclusions: Current practices aimed at reducing ED visits appear to be ineffective. Due to heterogeneity in patient populations and local infrastructure, a more tailored approach to ED visit reduction may be more successful.

A5018

Use of an Endoscopic Suturing Device for Primary Weight Loss in Class I and II Obesity: Single-Site Results of a Randomized Controlled Trial

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Background: The ESSENTIAL Trial is a prospective, 2:1 (active: sham) randomized, double blinded multi-site, trial evaluating the safety and effectiveness of the USGI Medical g-Cath™ EZ Suture Anchor Delivery Catheter as a weight loss endoscopic procedure (pose procedure™) for Class I obesity population with at least 1 non-severe obesity related co-morbid condition and Class II obesity population with or without a non-severe obesity related co-morbid condition. 332 patients were randomized over 11 sites and followed for 24 months. These are the 12 month results of the subjects enrolled at a single site involved in the study.

Methods: 32 subjects were randomly assigned to either a treatment group with g-Cath EZ suture anchors with low intensity diet and exercise ($n=22$, mean BMI 36.6 ± 2.2 kg/m²) or a sham procedure control group of low intensity diet and exercise alone ($n=10$, mean BMI 36.7 ± 2.2 kg/m²). 3 non-randomized lead-in cases were performed at our site. The primary safety endpoint for the entire cohort was a comparison between groups based on overall incidence of reported adverse events. Primary co-efficacy endpoints measured at the 12 month unblinding visit included a responder rate

defined as percentage of subjects with $\geq 5\%$ TBWL and an 8% observed mean %TBWL delta over sham. **Results:** Mean case time in the active group was 37 minutes with an average of 13.2 suture anchors placed per case. Subjects in the treatment group lost a mean of $9.73 \pm 7.2\%$ ($n=20$) of their body weight (TBL) compared to subjects in the control group who lost a mean of $0.07 \pm 5.0\%$ TBW ($N=8$) at the end of 12 months. Delta was 9.66 (3.95, 15.38 95% confidence interval). 75% of active subjects had $\geq 5\%$ total body weight loss at primary endpoint. There was 1 SAE in the active and lead-in groups ($N=35$, 4.0%). There were 12 subjects in the active group (12/22 =55%) who experienced at least 1 adverse event possibly or probably related to the procedure. All resolved without sequelae. **Conclusions:** At the University of Miami site, the $\langle \text{em} \rangle$ pose procedure $\langle /em \rangle$ with diet and exercise was found to be superior to diet and exercise alone, meeting both co-primary efficacy endpoints and appears to be a safe procedure.

A5019

MORBIDITY AND MORTALITY OF GASTRIC SLEEVE AND BYPASS PATIENTS WITH ELEVATED HBA1C LEVELS

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Background: Over the past several decades, laparoscopic Roux-en-Y gastric bypass and vertical sleeve gastrectomy offer excellent surgical options in the management of obesity as well as diabetes mellitus type 2. As the popularity of these procedures increase, it becomes necessary to determine the risk-benefit when selecting patients for these surgeries. The purpose of this study is to analyze the effect of elevated pre-operative HbA1c within the patient population undergoing these procedures and how it affects post-operative success, recovery, and complications.

Methods: This is a retrospective cohort study with patients recruited from the Loma Linda University Healthcare Bariatric Surgery database. Data was collected from patients that received either the gastric sleeve or bypass procedure from July 2012 to July 2015. Inclusion criteria are patients above the age of 18 who underwent laparoscopic vertical

sleeve gastrectomy or laparoscopic Roux-en-Y gastric bypass. Patients were excluded if younger than 18 years, lost to follow-up within 30 days after surgery, or did not have any recorded HbA1c values within 6 months prior to surgery. Patients were separated into 3 groups determined by their HbA1c level, either below 6.5 mg/dL (Group A), between 6.5-8.0 mg/dL (Group B), and above 8.0 mg/dL (Group C). Follow-up was continued on all groups for a minimum of 1 year. The 3 groups were then analyzed using the Chi-Square method for complication rates, operative success, and post-operative HbA1c changes. Complications were graded as either early (within 30 days) or late (after 30 days), as well as major or minor. Major complications were assessed as reoperation, wound infection, leak, venous thrombosis, or death. All other complications were deemed minor. **Results:** A total of 192 pts were collected, 138 in Group A, 33 in Group B, and 21 in Group C. Group A demonstrated a 22/138 (15.9%) complication rate, Group B had 6/33 (18.2%), and Group C had 3/21 (14.3%). The overall complication rate from the procedures was 31/192 (18.2%). 10 (5.2%) of the complications were major complications, including 6 wound infections, 1 DVT, 1 leak, and 2 anastomotic strictures, there were no deaths. 21 (10.9%) of the complications were minor, including dehydration, nausea, emesis, and diarrhea. 21 of the complications were early, and 14 were late. The chi-square statistic for the study is 0.2216, with a p-value of 0.895106. This shows no significance in the results between the groups.

Conclusion: Our study showed no significant difference in morbidity outcomes major or minor in patients with poorly controlled diabetes versus patients with either well controlled diabetes or none at all. This indicates that patients with HbA1c > 8.0 mg/dL can safely undergo these surgical procedures without any increased risk in morbidity or mortality. The lack of significance indicates that weight loss surgery should not be unnecessarily delayed for patients with poorly controlled diabetes, as the long term efficacy of the surgery has proven benefits. The study can be strengthened by factoring in long term efficacy of weight loss surgery and its effect on diabetes management. Limitations of this study include short duration of follow-up (1 year), small sample size, as well as its retrospective nature. Patients with poorly controlled diabetes with a multidisciplinary team approach including endocrinologists can safely and effectively undergo bariatric surgery.

A5020

Variation in bariatric surgery episode costs in the commercially insured: Implications of bundled payments in the private sector

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Importance: Bundled payments are slowly rolling out as a policy aimed at reducing healthcare costs. These fixed, lump sum payments are intended to cover all services (i.e., facility, professional, and post-acute care) surrounding a surgical 'episode'. Payers feel cost savings will be realized through better-coordinated, higher quality, and more cost-conscious care. Research on surgical episode cost variation for common inpatient procedures, such as bariatric surgery, has largely focused on Medicare beneficiaries and largely excluded the commercially-insured population.

Objective: To study hospital variation in bariatric surgery episode cost for commercially-insured patients.

Design, Setting, and Participants: We used data from a state-wide collaboration between a major commercial insurer and hospitals in Michigan. We retrospectively identified patients undergoing bariatric surgery procedures- sleeve gastrectomy (sleeve) or Roux-en-Y gastric bypass (RYGB)- from January 2009 through October 2014 and included in the analysis only those hospitals that performed a minimum of 30 procedures during the study period (N=9035 procedures, 31 hospitals). We calculated price and risk-adjusted payments from the date of admission for the index hospitalization to 30 days post-discharge. We then divided hospitals into cost quintiles based on the average episode cost of procedures occurring at each facility and examined variation in four components of episode cost, namely index hospitalization, professional fees, post-acute care costs, and readmissions.

Main Outcomes and Measures: Hospital variation in bariatric surgery episode costs, broken down by four cost components, as well as the share of variation between highest and lowest cost hospitals for which each of these components was responsible. Results We found that the average risk and price-adjusted cost for a bariatric surgery episode was \$12,246. The highest-cost quintile averaged \$1,519 (12%) more per episode than the lowest cost quintile. Index hospitalization accounted

for the largest share of episode costs and explained much of the variation between highest and lowest hospital cost quintiles. For RYGB, index hospitalization accounted for 73% of the total episode cost, and accounted for 58.3% of the variation seen between highest and lowest cost quintiles. For sleeve procedures, index hospitalization accounted for 80% of the total episode cost, but accounted for only 35% of variation between highest and lowest cost quintiles (Figure 1). Readmission and post-discharge payments accounted for disproportionate shares of the variation seen between highest and lowest cost quintiles. This result was more pronounced in the case of sleeve procedures, in which each of these cost components individually explained a greater share of the variation between quintiles than did professional fees. For example, post-discharge payments accounted for 3.9% of total episode payments for sleeve procedures, but explained 22.6% of variation between highest and lowest cost quintiles. Professional fees accounted for a significant proportion of episode costs (19.4% and 13.4% for RYGB and sleeve procedures, respectively), and variation in this cost component explained a roughly proportional share of variation between highest and lowest cost quintiles (Figure 1).

Conclusions and Relevance: Our findings demonstrate substantial variation in bariatric surgery episode costs in the commercially insured population. While index hospitalization accounted for the largest share of episode costs, variation in other cost components (i.e., readmissions and post-discharge payments) explained a share of variation between highest and lowest hospital cost quintiles disproportionate to their contribution to overall cost. An understanding of the individual components of episode costs and the biggest drivers of variation among hospitals will allow hospital administrators to better focus quality and efficiency-improvement efforts under a bundled payments system.

A5021

Single-Anastomosis Duodeno-Ileal bypass with Sleeve gastrectomy (SADI-S). Absolute results at 5 years.

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Introduction: SADI-S was introduced as a modification of the duodenal switch in May-2007. Short and medium-term results, as in weight loss as in metabolic improvement, have been satisfactory, and so SADI-S has replaced duodenal switch and other types of biliopancreatic diversion in our institution.

Aim: To present absolute results at 5 years of SADI-S as a primary technique for the treatment of morbid obesity and its metabolic complications. Patients. 100 patients were consecutively operated from May 2007 to May 2011, completing 5 years follow up. The surgical technique was a sleeve gastrectomy over a 18 mm bougie (54 French) and a common channel of 2 meters in the first 50 cases and 2.5 meters in the next 50 patients. The duodeno-ileal anastomosis was mechanically performed with a 30 mm blue cartridge endoGIA.

Results: Surgery was laparoscopically completed in 95 cases. The mean age of the series was 48 years (22 - 71), the mean weight 119 kg (72 - 164) and the mean body mass index (BMI) 44.6 kg/m² (33 - 67). There were 14 postoperative complications, 1 gastric leak and 1 anastomotic leak, both treated conservatively. Follow up was 73% at 5 years. The mean BMI at 5 years was 27 kg/m², the mean excess weight loss 87% and the mean total weight loss 37%. Although patients with a shorter common channel had a better weight loss, differences were not statistically significant. Six patients didn't achieve a 50% excess weight loss (8.2%), and 7 patients have been operated in these 10 years to enlarge the common channel for severe or recurrent hypoproteinemia. Sixty-six patients were diabetics, and 57 of them were under oral (27) or insulin (30) therapy. Their mean preoperative HbA1c was 8% (5.4 - 14%) and only 4% had values below 6%. At 5 years, 70% of the patients (36/51) were off-treatment, and 74% (32/43) had a normal HbA1c (below 6%).

Conclusions: In the long term SADI-S behaves as an effective surgery both for the treatment of morbid obesity and type-2 diabetes associated to obesity.

A5022

Five Years Results After ReSleeve Gastrectomy

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Introduction: Laparoscopic sleeve gastrectomy(LSG) has rapidly become increasingly popular in bariatric surgery. However, in the long-term follow-up, weight loss failure and intractable severe reflux after primary LSG can necessitate further surgical interventions. The aim of our study was to evaluate long term results (5 years) following resleeve gastrectomy(ReSG).

Methods: Thirteen patients underwent ReSG between October 2008-June 2011 from a total of 66 cases of ReSG. All patients with failure after primary LSG underwent radiological evaluation and an algorithm of treatment was proposed. We have analyzed the 5-year outcome concerning weight loss and long-term complication after ReSG.

Results: Thirteen patients (12 women; mean age-41.6 years) with a body mass index (BMI) of 39.1 Kg/m²; underwent ReSG. The mean interval time from the primary LSG to ReSG was of 29.6 months (11-67months). The indication for ReSG was insufficient weight loss-8 patients (61.5%), weight regain - 4 patients (30.7%), and gastroesophageal reflux disease (GERD) - 1 patient. In 9 cases the gastrografin swallow results were interpreted as primary dilatation and in the remaining 4 cases as secondary dilatation. One patient died from gynecological cancer. Of the remainder, 1 patient underwent SADI at 33 months after ReSG for a BMI of 39.2 and 1 patient underwent ReSG for reflux. The rest of 10 patients had available data at 5 years follow up. The mean excess weight loss (EWL) was 58.2% (range 3.3-100%). Of the 10 patients, 7 patients had >50% EWL at 5 years. All the 3 patient with failure of EWL (< 50 %) were the first 3 cases of our series and 2 out of them had secondary dilatation. All cases were completed by laparoscopy with no intraoperative incidents. One case of gastric stenosis was recorded. No other complications or mortality were recorded.

Conclusions: At 5 years postoperative, the ReSG as a definitive bariatric procedure remained effective for 58.3 %. The results appear to be more favorable especially for the non-super-obese patients and for primary dilatation. ReSG is a well-tolerated bariatric procedure with low long-term complication rate. Further prospective clinical trials are required to compare the outcomes of ReSG with those of LRYGB or DS for weight loss failure after LSG.

A5023

The utility of diagnostic laparoscopy in post-bariatric surgery patients with chronic abdominal pain of unknown etiology

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Background: Chronic abdominal pain after bariatric surgery is associated with diagnostic and therapeutic challenges. The aim of this study was to evaluate the yield of laparoscopy as a diagnostic and therapeutic tool in post-bariatric surgery patients with chronic abdominal pain who had negative imaging and endoscopic studies.

Methods: A retrospective analysis was performed on post-bariatric surgery patients who underwent laparoscopy for diagnosis and treatment of chronic abdominal pain at a single academic center. Only patients with both negative pre-operative CT-scan and upper endoscopy were included.

Results: Total of 35 post-bariatric surgery patients met the inclusion criteria, and all had history of Roux-en-Y gastric bypass. Median duration from bariatric surgery to first abdominal pain presentation was 26 months (IQR 12-41). Median operative time was 64 minutes (IQR 52-85), and median length of hospital stay was 1 day (IQR 0 to 2). Twenty out of 35 patients (57%) had positive findings on diagnostic laparoscopy including presence of adhesions (n=12), chronic cholecystitis (n=4), mesenteric defect (n=2), internal hernia (n=1), and necrotic omentum (n=1). Half of the adhesions occurred at the jejunojejunostomy. All four patients with intraoperative diagnosis of cholecystitis had histopathological findings compatible with chronic cholecystitis. One patient with an internal hernia required conversion to a laparotomy for reduction of hernia and closure of mesenteric defect at the jejunojejunostomy. Two patients developed postoperative complications within 30 days including a pelvic abscess requiring percutaneous image-guided drainage, and an abdominal wall abscess necessitating incision and drainage. No mortalities occurred. Overall, 15 patients (43%) had symptomatic improvement after laparoscopy; 14 of these patients had positive laparoscopic findings requiring intervention (70% of the patients with positive laparoscopy). Conversely, 20 (57%) patients (14 out of 15 with negative laparoscopy and 6 patients with positive laparoscopy) required long-term medical treatment for management of chronic abdominal pain.

Conclusion: This study highlights the importance of offering diagnostic laparoscopy as both a diagnostic

and therapeutic tool in post-bariatric surgery patients with chronic abdominal of unknown etiology. Diagnostic laparoscopy, which is a safe procedure, can detect pathological findings in more than half of post-bariatric surgery patients with chronic abdominal pain of unknown etiology. About 70% of patients with positive findings on diagnostic laparoscopy experience significant symptom improvement. The vast majority of patients with negative laparoscopy had chronic abdominal pain with no organic cause, necessitating long-term pain management. Patients should be informed that diagnostic laparoscopy is associated with no symptom improvement in about half of cases.

Keywords: Bariatric surgery, diagnostic laparoscopy, abdominal pain, gastric bypass

A5024

The incidence and clinical features of hypoglycemia after bariatric surgery

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Introduction: Our knowledge of post-bariatric surgery hypoglycemia consists mostly of case reports. The incidence, severity, and results of treatment on a large population of bariatric patients are unknown. The purpose of this study is to determine the incidence of post-bariatric surgery hypoglycemia, its clinical features and management outcomes over a 13-year period at our institution.

Methods: Patients who underwent bariatric surgery at a single academic center between 2002 and 2015 and had a postoperative glucose level of less than 70 mg/dl were identified. Data collected included baseline demographics, perioperative variables, clinical presentation, and the management outcomes. Data was summarized as the median and interquartile range (IQR) for continuous variables and as count and frequency for categorical variables.

Results: Out of 5600 patients who underwent bariatric procedures (50% gastric bypass, 42% sleeve gastrectomy, and 8% gastric band), 114 (2%) had a postoperative glucose level <70mg/dl. Eighty-nine (78%) were female. Median age was 47 years (IQR 38-58) and median preoperative BMI was 46 kg/m² (IQR 42-52). Co-morbidities included hypertension

(70%, n=80), sleep apnea (56%, n=64), dyslipidemia (54%, n=61), diabetes mellitus (45%, n=51) and fatty liver (40%, n=45). None of these patients had Addison disease, insulinoma, or pancreatitis.

Bariatric procedures performed were Roux-en-Y gastric bypass (n=96, 84%), sleeve gastrectomy (n=14, 12%), adjustable gastric band (n=3, 3%), and duodenal switch (n=1, 1%). The median onset of hypoglycemia after bariatric surgery was 835 days (IQR 391-1621), and the median plasma random glucose level during this episode was 54 mg/dl (IQR 45-64). Sixty-nine patients (1.2%) had symptomatic hypoglycemia. The hypoglycemia-related symptoms were dizziness (n=38), weakness (n=32), sweating and clamminess (n=25), nausea (n=16), drowsiness (n=14), syncope (n=13), headache (n=10), abdominal fullness (n=8), breathlessness (n=8), palpitation (n=6), restlessness (n=3), vomiting (n=3), and shock (n=3). The three patients with shock had concurrent sepsis. There were 26 patients admitted to the hospital for further management. The causes for the hypoglycemia in this group were poor oral intake (77%), infection (46%), and diabetic medications (23%). Eleven patients were investigated by endocrinologists for persistent hypoglycemia with laboratory tests and radiological investigations. In addition to dietary adjustment, pharmacotherapy was started on 4 patients for persistent postprandial hypoglycemia: Acarbose (n=2), Acarbose and Metformin (n=1), and Glucose tablet (n=1). Ten patients had feeding interventions (feeding tube placement, n= 10 with a median duration of 5.5 months; and parenteral nutrition, n=2 with a median duration of 21 months). None of the patients required reversal of bariatric surgery or pancreatic surgery for management of hypoglycemia. The majority of these symptomatic patients had their symptoms almost resolved (n=61, 88%). Five patients had improvement with minimal disability, but 3 patients had major disabilities related to malnutrition.

Conclusion: The incidence of symptomatic hypoglycemia in our cohort was 1.2% and was most commonly seen after gastric bypass. One-third required hospitalization and 14% required nutritional intervention in the form of feeding tube placement or parenteral nutrition. The majority of patients had self-limited disease that was successfully managed with dietary counseling and occasionally pharmacotherapy. No surgical reversal or pancreatic procedures were performed. There were no direct mortalities. Keywords: Bariatric

surgery, glucose, hypoglycemia, malnutrition, gastric bypass, sleeve gastrectomy, complication

A5025

Bariatric Surgery in Patients with Pulmonary Hypertension

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Abstract-Background: Data regarding the management of bariatric surgery patients with pulmonary hypertension are scarce, and there are links between insulin resistance (IR), obstructive sleep apnea (OSA), obesity hypoventilation syndrome (OHS) and pulmonary hypertension (PH). Since IR, OSA, and OHS all improve with bariatric surgery the aim of this study was to review our experience on bariatric surgical patients with PH to describe our outcome data and evaluate for any improvement in PH.

Methods: Data was collected in a prospectively maintained database between January 2005 and November 2015. Patients who underwent either a primary or revisional weight loss surgery with pulmonary hypertension, as diagnosed by right ventricle systolic pressure (RVSP) \geq 35mm Hg, were included.

Results: Sixty-three patients met inclusion criteria. 10 (15.9%) were male. Mean age was 54 and mean body mass index (BMI) was 49.7 ± 9.7 kg/m². The median time from diagnosis to bariatric surgery was 10.7 months (Range 0.1-117.1). Patients had a high prevalence of obstructive sleep apnea (n=53, 84.1%). 32 (50.8) patients had type 2 diabetes mellitus. There were 16 patients diagnosed with heart failure and 2 had right heart failure. Eight (12.7%) patients had preoperative history of pulmonary emboli. American Society of Anesthesia classes were 2 (n=1, 1.6%), 3 (n=44, 69.8%), and 4 (n=18, 28.6%). Both primary and revisional bariatric surgery (n=6, 9.5%) were performed including Roux-en-y gastric bypass (RYGB, n=35, 55.6%), sleeve gastrectomy (SG, n=24, 38.1%), adjustable gastric banding (AGB, n=3, 4.8%),

gastric plication with banding (GPB, n=1, 1.6%). The 6 revisions were SG to RYGB (n=3, 4.2%), AGB to RYGB (n=1, 1.6%), revision of failed VBG to RYGB (n=1.6%), and common channel lengthening of duodenal switch (n=1, 1.6%). Most procedures (n=59) were completed laparoscopically, there was one conversion for hemorrhage, and the other three were planned open operations. Mean operative time was 156± 56minutes. Median length of stay (LOS) was 3 days (range 1-71 days). Fifteen patients (23.8%) developed complications. Eight of these (12.5%) were major complications (leak n=3, post-op surgical site infections requiring intervention n=3, hemorrhage n=1, pulmonary emboli n=1). There was no 30 day mortality. Weight loss at one month (99% follow up) and one year (78% follow up) demonstrated a decrease in mean BMI of 4.1 and 10.9 mg/kg² with a median %EWL of 18.9% and 51.2%, respectively. Furthermore, analysis of the 12 (19%) patients who had available postoperative RVSP by Doppler echocardiography more than 1 year after surgery revealed a statistical significant improvement in the RVSP (p≤0.05) by Wilcoxon ranked sum test.

Conclusion: Bariatric surgery can be performed without prohibitive complication rates in patients with PH. In our experience, bariatric patients with pulmonary hypertension achieved significant weight loss and improvement in RVSP. **Keywords:** Pulmonary Hypertension; Bariatrics; Gastric Bypass; Sleeve Gastrectomy; Morbid Obesity

A5026

Duodenal-Ileal Bypass (DIPASS) for Type 2 Diabetes Mellitus: Tools and techniques for minimally invasive deployment of magnetic anastomotic rings (MAGNAMOSIS)

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Background: Bariatric surgery corrects insulin resistance in patients with type 2 diabetes independent of weight loss. One mechanism appears to be stimulation of incretins such as GLP1 from ileum exposed to upper intestinal contents. DIPASS, a magnetic compression anastomosis between the duodenum and distal ileum, may mimic the favorable metabolic effect of more extensive

bariatric procedures. We have developed and tested tools and techniques that will allow DIPASS to be a minimally invasive outpatient procedure.

Materials and Methods: The Magnamosis rings are composed of a set of rare-earth magnets encased in polycarbonate with a radially increasing gradient (Figure 1). Using magnets to construct a duodenal-ileal bypass enables the procedure to be performed minimally invasively. The proximal Magnamosis device is deployed in the distal duodenum or proximal jejunum using a gastroscope with a newly developed delivery hood and snare. The distal ileal Magnamosis device can be introduced similarly, retrograde through the ileocecal valve, using a colonoscope and with carrier and snare.

Additionally, the distal magnet can also be introduced laparoscopically using a non-magnetic bowel grasper and a second tool to magnetically capture and drag the device down the intestine and quickly milked from the stomach down to the ileum. The Magnamosis devices are brought into magnetic proximity under laparoscopic control to insure safe placement without intervening structures.

Results: Iterations of the delivery devices were tested on swine small bowel both *in vitro* and *in vivo*. The optimal design of the non-magnetic grasper was machined from non-magnetic 303 steel in the size and shape of a standard laparoscopic Davis and Geck grasper. The techniques for moving the Magnamosis device inside the intestine were tested and refined in anesthetized pigs. The optimal design proved to be a radially magnetized 6-mm solid cone rare-earth magnet attached inside a non-magnetic tube. When engaged from outside the bowel with the intraluminal Magnamosis device, the intraluminal device rolls, allowing easy movement of the device without too much friction against the bowel wall. Endoscopic delivery is enabled by a transparent hood that carries the Magnamosis device without obstructing the endoscopist's vision.

Conclusions: Magnetic DIPASS is a novel procedure that may provide a minimally-invasive, outpatient therapy for type 2 diabetes mellitus. Novel tools and techniques have been developed and tested that allow DIPASS to be accomplished using laparoscopic, endoscopic, or hybrid techniques.

A5027

Laparoscopic Bariatric Surgery Performed on an Ambulatory Outpatient Basis

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Background: As technology, patient education and healthcare delivery systems have improved over the past several decades, procedures once performed exclusively in an inpatient hospital setting, are now being safely performed on an ambulatory outpatient basis. Today major bariatric procedures, such as laparoscopic sleeve gastrectomy and gastric bypass, are most commonly performed in a hospital setting. To date, little is known of the feasibility and safety of performing these surgical procedures on an outpatient ambulatory basis. We used an established obesity risk stratification model (OS-MRS) that categorized patients based on somatic characteristics and associated co-morbid conditions. This model was used as a guide to determine patients that might be candidates to safely undergo major bariatric surgery on an ambulatory outpatient basis.

Methods: We reviewed our series of bariatric procedures performed over the last 5 years. From January 2010 to December 2015 we performed 2,421 laparoscopic gastric stapling bariatric procedures. There were 1,336 (55.1%) patients who underwent laparoscopic roux-en-y gastric bypass. And of these 351 patients (26.2%) were performed on an outpatient ambulatory basis. There were 1,085 (44.8%) patients that underwent laparoscopic gastric sleeve surgery. Of these, there were 772 (71.1%) patients that had surgery performed on an ambulatory outpatient basis.

Results: We performed 1,123 (46.3%) bariatric stapling procedures in select patients over a five-year period on an ambulatory outpatient basis. Of the patients undergoing outpatient bariatric stapling surgery, 351 underwent gastric bypass surgery and 772 patients had laparoscopic sleeve gastrectomy. Overall there were 37 (3.2%) post-operative complications requiring hospital readmission in this series. There were 4 leaks (.35%) in this population of patients undergoing ambulatory outpatient surgery. One leak (.28%) occurred in the gastric bypass group, and 3 leaks (.38%) occurred in the laparoscopic sleeve gastrectomy group. The leaks occurred an average of 11 days following surgery (range 4 - 22 days). There were 11 (.97%) patients who were readmitted to a hospital setting because of postoperative intra-abdominal bleeding. Two patients (.56%) had undergone gastric bypass and 9 patients (1.1%) had undergone laparoscopic gastric sleeve surgery. Four patients (4 sleeve patients) were returned to the operating room for exploration. The remaining patients were treated

conservatively. Eight patients required blood transfusion (2 gastric bypass patients and six sleeve patients). There were 2 patients that developed deep venous thrombosis. There were no patients that had pulmonary emboli in this series. There were 10 patients (.89%) admitted to the hospital for dehydration were rehydrated and released. All were treated and released without further incident. One laparoscopic gastric bypass patient developed post-operative bowel obstruction. Four sleeve (.51%) patients developed gastric obstruction secondary to intraluminal gastric defects. All were managed with stent placement with subsequent resolution and no further intervention. Six patients (.53%; 4 bypass patients, and 2 sleeve patients) had unplanned transfers from the outpatient facility to the hospital for observation. All were subsequently released on an average of 2 day stay (range 1 - 4 days)

Conclusions: We herein present our results and selection criteria for patients undergoing bariatric surgical stapling procedures on an ambulatory outpatient basis. We contend that highly select patients undergoing stapled gastric bariatric procedures may be safely performed on an ambulatory outpatient basis. As a result of the presented data, we will discuss the protocol changes made to address the complications seen in this study.

A5028

Sleeve Gastrectomy leak: endoscopic management through customized bariatric stent.

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Introduction: One of the most feared complications after Sleeve Gastrectomy (SG) is gastric fistula. Management includes clinical, endoscopic and surgical measures. Endoscopic stenting aims to decrease intragastric pressure, reshape the stomach and isolate the leak orifice. However, traditional stents do not adapt well to the SG anatomy, with a high migration rate.

Objectives: This study evaluates post-SG endoscopic leak treatment, through placement of a long customized bariatric stent.

Methods: This is a retrospective, observational, longitudinal, consecutive case series, performed at the General Surgery Department of the Federal University of Pernambuco - Brazil and Bariatric Endoscopy Department - 9 de Julho Hospital, Brazil. Patients were submitted to endoscopic treatment through placement of a customized fully covered self-expandable metallic stent (180 x 25 x 30 mm or 200 x 25 x 30 mm) (Expand Stent, Plastimed S.R.L., Argentina), specially designed for the SG anatomy. This study has local Ethics Committee approval. All patients with SG leaks treated at these facilities with customized stents were evaluated. Fistula healing aspects and stent related complications were analyzed.

Results: Eighteen patients were included, most were female (61.1%), with a mean age of 40.3 years. Most cases consisted of primary SG, except for one post-gastric band revisional surgery and one Duodenal Switch. Leak diagnosis ranged from 4th to 18th POD, all located on His angle. Eleven patients were submitted to previous surgical drainage, and three to CT guided percutaneous drainage. Stent placement ranged from 12th to 40th POD, under general anesthesia, with radioscopy control. Stent length was 18 cm in six cases, and 20 cm in twelve, mostly being placed in a trans-pyloric position when possible (n=12). No dilation to accelerate stent opening or fixation methods were used (such as clips or suturing). Endoscopic septotomy was done in two cases only, without further endoscopic measures for other cases. All patients referred severe stent related symptoms, such as nausea, vomiting and retrosternal pain, controlled with oral medications, with relief to mild symptoms after 4-5 days in most cases. Stents were removed from the 3rd until the 5th post-implant week, after x-ray with absence of contrast extravasation, under radiologic control. Distal migration happened in three cases, on weeks one and two (all placed in a pre-pyloric position), treated by endoscopic repositioning. Self-limited hematemesis happened in one case. In 16 cases the healing time was under 5 weeks, in one case it was 14 and in other 8 weeks. Follow-up ranged from 3 to 24 months.

Conclusions: SG custom made stents are a safe and effective option for leak treatment, with a low complication rate, feasible in the early post-operative period. Most patients will experience gastrointestinal symptoms, which tend to improve.

Migration rate is low, especially when the stent is removed early, and seems to be related to a pre-pyloric position.

A5029

Modified Duodenal Switch (MDS) or SIPS (Stomach Intestine Pyloric Sparing) Results and Significance
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Introduction: Duodenal switch(DS) offers the greatest weight loss and resolution of co-morbid conditions as compared to other bariatric procedures. However, it represents a small percentage of total cases because of technical difficulty and risk of long-term nutritional deficiencies. Modifications that would make the procedure simpler and reduce the risk of malnutrition, yet, preserve the majority of efficacy would be beneficial.

Methods: The modified DS included a longitudinal gastrectomy performed over a 42 bougie, duodenal transection 3 cm past the pylorus, and attachment to the small bowel with a single anastomosis 3 meters from the ilio-cecal valve. This report includes cases done at three centers in two states by two surgeons (Utah, New York) using similar techniques. This study reviews data from all procedures performed at the above three centers. All revisional surgeries were excluded.

Results: A total of 168 patients (78 Utah and 90 in New York) were included in this study, with 96 (of 168) patients that have data beyond one year. On Average, patients lost 12 BMI units at 6 months (n=168, none lost to follow-up). At 18 months (n=96 with 20 lost to follow-up), they lost around 19 units, which correlates to an average excess body weight loss of 74% and almost 40% of total body weight loss. At 19-26 months (n=22 with 21 lost to follow-up), patients showed a BMI reduction of 22 units, correlating to an excess body weight loss of 82%, and total body weight loss of almost 44%. 5 patients had diarrhea, 4 had intra-abdominal hematoma, 1 mesenteric venous thrombosis, 1 leak, 1 stricture and one death due to cardiac arrhythmia during the given period. There were no small obstructions, or loop related complications during the follow up period. Weight loss results were nearly identical at each center. At one year, nutritional data was present for 45 patients (of how many), which shows

an average Vit-D level of 32.2, Vit -B1 of 133.4, Vit-B12 of 1075.4, Vit-A of 40.8 and Albumin of 3.9. Weight loss was comparable at each location.

Conclusion: As compared to DS, MDS eliminates the distal anastomosis and our data shows effective weight loss and no complications related to the single anastomosis configuration. Bile reflux should not be an issue with post pyloric reconstruction. Weight loss compares favorably to historic reports of other bariatric procedure. By extending the common channel nutritional results are encouraging without obvious compromise of weight loss. Furthermore, the consistency of results at the various locations highlights the operative efficacy.

A5030

GASTRIC BAND CONVERSION TO ROUX-EN-Y GASTRIC BYPASS SHOWS GREATER WEIGHT LOSS THAN CONVERSION TO LONGITUDINAL SLEEVE GASTRECTOMY: TWO YEAR FOLLOW-UP

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Aims: Roux en-Y gastric bypass (RYGB) and longitudinal sleeve gastrectomy (LSG) are often utilized as revisional surgeries for a failed laparoscopic adjustable gastric band (LAGB). There is debate over which procedure provides better long-term weight loss. The purpose of this study was to compare the weight loss results of these two surgeries at our institution.

Methods: A retrospective review was conducted of all band to bypass and band to sleeve surgeries performed at our hospital. Patients < 18 years of age and body mass index (BMI) < 30 prior to second procedure were excluded from analysis. Primary outcomes were change in BMI, % excess BMI lost (EBMIL), and % total body weight loss (TWL). Secondary outcomes included 30-day complication and reoperation rates.

Results: After controlling for age and BMI, the cohort included 144 conversions from LAGB to RYGB and 146 LAGB to LSG. Statistical comparisons made between the two groups at 12-months post-conversion were significant for BMI (RYGB=32.7, LSG=35.9, $p < 0.0001$), %EBMIL (RYGB=60.8%, LSG=46.0%, $p < 0.0001$), and %TWL (RYGB=24.9%,

LSG=18.2%, $p < 0.0001$). Conversion to RYGB also showed significantly decreased BMI, increased %EBMIL, and increased %TWL at 18 and 24-month time points compared to conversion to LSG. However, the conversion to RYGB group had longer lengths of stay (LOS) (3.58 vs 2.34 days, $p < .0001$), OR times (169 vs 125 minutes, $p < .0001$), and a higher rate of reoperation (9.0% versus 2.1%, $p = 0.010$) than the band to sleeve group. Although not significant, the conversion to RYGB group had a higher rate of readmission (9.7% versus 4.1%, $p = 0.067$).

Conclusions: Weight loss is significantly greater for patients undergoing LAGB conversion to RYGB than LAGB to LSG. There were statistically significant differences in BMI, %EBMIL, and %WL at 12 months between the two surgeries. Conversion to RYGB had a slightly higher reoperation rate, along with longer LOS and OR time. Patients looking for the most effective weight loss conversion surgery after failed LAGB should be advised to have RYGB performed.

A5031

Re-operations for long-term complications following laparoscopic adjustable gastric banding: Analysis of incidence and causality

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Background: The disease of obesity and the prevalence of associated co-morbid conditions represents the most significant public health threat of our time. Weight loss surgery has proven to be the most effective long-term treatment for patients suffering from obesity and has a significant impact on patient life expectancy. Laparoscopic Adjustable Gastric Banding (LAGB) is a purely restrictive procedure with moderate weight loss results that received FDA approval in The United States in 2001 as an alternative to the more invasive bariatric procedures. Since the LAGB procedure gained popularity in the early 2000s, the potential for long-term complications requiring surgical intervention has become evident. Although the number of LAGB procedures performed in The United States has significantly declined, the procedure is still performed and patients with indwelling bands continue to need follow up. This study was undertaken to determine the incidence of surgical interventions and the various complications that lead to reoperation after LAGB and to better

understand predictive factors that may influence these complications.

Methods: Institutional Review Board approval to conduct the study was obtained at a university affiliated tertiary care center with an American Society of Metabolic and Bariatric Surgery Center of Excellence designation. A retrospective chart review was performed on 200 consecutive patients undergoing LAGB from 2005 to 2011. Data collected included age, gender, pre-operative body mass index (BMI) and the pre-operative comorbidities of diabetes mellitus (DM), hypertension (HTN), obstructive sleep apnea (OSA), and gastro-esophageal reflux disease (GERD). Complications data, including band slippage/prolapse, weight loss failure, band intolerance, port/tubing complications and gastric erosion, were collected through October 2014. Statistical analyses were performed using the SPSS statistical package. Bivariate relationships were analyzed with Chi-Square and t-tests. Multivariate analysis was conducted using a binomial logistic regression model since the outcome of interest was dichotomous (reoperation versus no reoperation).

Results: A total of 200 patients were studied, with a mean follow-up of 6 years (range 1-9). Ninety percent of patients were female, with a mean age of 53.5 years (S.D.=11.7; range 24-78) and mean pre-operative BMI of 44.2 kg/m² (S.D.=5.5). HTN was the most common pre-operative morbidity (66%), followed by OSA (48%), GERD (48%) and DM (35%). Fifty-one (26%) of the 200 patients had a complication requiring reoperation including band slippage/prolapse in 24 (47%), weight loss failure in 18 (35%), band intolerance in 4 (8%), port/tubing complications in 3 (6%), and band erosion in 2 (4%). Patients who required reoperation were, on average, younger (mean=47.4, S.D.=11.8; T=4.5; p=.000) than those who did not require reoperation (mean=55.5, S.D.=10.9). While gender (p>.05), pre-operative OSA (p>.05), GERD (p>.05) and DM (p=.056) were not related to reoperation in bivariate analyses, pre-operative HTN was negatively correlated with reoperation (Chi Square=10.9; p=.001). The relationships between lack of pre-operative HTN (p=.033) and young age (p=.001) on the likelihood of reoperation persisted when other co-morbidities and personal characteristics were controlled for in multivariate analysis. Multivariate analysis also revealed pre-operative GERD to be a statistically significant predictor of LAGB reoperation (p=.016).

Conclusions: Despite the attractiveness of a minimally invasive purely restrictive procedure with

an excellent perioperative safety profile in the fight against the disease of obesity, the LAGB has been associated with a significant number of long-term complications. After a 6-year mean follow up, more than 25% of patients who underwent LAGB with a goal of long-term weight loss developed complications requiring surgical intervention. Patients with younger age, the presence of pre-operative GERD and lack of pre-operative HTN were more likely to develop band complications requiring surgical intervention with band slippage/prolapse being the most common complication. The LAGB procedure may have a role in a subset of patients suffering from obesity and is still performed today, and many patients with indwelling bands continue to seek follow up at surgical centers. Clinicians caring for these patients should be aware of the complications requiring interventions and the associations of these complications with patient characteristics.

A5032

Seven year History of band removals at Banner Health Gateway and Estrella, Arizona

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More than one-third (34.9% or 78.6 million) of U.S. adults are obese. Obesity contributes significantly to chronic disease in the United States and as a consequence obesity related co-morbid conditions are an increasing strain on our health care system. The estimated annual medical cost of obesity in the U.S. was \$147 billion in 2008 U.S. dollars; the medical costs for people who are obese were \$1,429 higher than those of normal weight. In an attempt to treat obesity, many patients have undergone laparoscopic adjustable gastric band placement (LAGB). However, in recent years, growing trends toward band removal due to complications and patient dissatisfaction have been noted. This intent of this study is to identify variables and patient factors driving LAGB removal and to establish clinical guidelines for managing patients who present for LAGB removal. This a retrospective review of 85 patients that underwent gastric band removal from 2012-2015. Variables examined included gender, age, height, initial (pre-surgical) body weight (IBW) and post-surgical body weight (BW), average body mass index (BMI), and total treatment time. Patients were screened for comorbid conditions. Indications

for band removal were also reviewed. The average age of patients undergoing LAGB removal was 51 years. Ten were male (11.6%), 76 female (88.4%). Average BMI at the time of removal was 39.8 kg/m². Eight patients (9.3%) underwent LAGB placement by our group, while the majority of bands were placed outside of Arizona, including Mexico. At one month status post band removal the average BMI was 41.8kg/m², a 2.0 kg/m² increase. Testing such as fluoroscopy, CT scan, UGI and upper endoscopy were performed prior for diagnostic purpose. The most common indication for band removal was dysphagia, with or without esophageal dilatation (N=42, 56.8%), followed by failure to lose weight/weight regain (N=19, 25.7%), slippage of the band (N=12, 16.1%), and band erosion (N=1, 1.3%). At the time of band removal, a total of 17 patients (19.7%) had documented plans for additional surgical management of obesity. Patients failing to follow up at 1, 3 and 6 months after surgery were 26(03.2%), 57(66.2%) and 65(75.6%) respectively, suggesting a high rate of poor compliance. In conclusion, dysphagia is the most common reason cited for band removal. Furthermore, compliance and follow up is very challenging after band removal and an area that deserves further attention and study.

A5033

Gastric necrosis due to adhesive band formed by LAP-BAND fixation suture managed by laparoscopy-assisted LES preserving proximal gastrectomy

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Background: Laparoscopic adjustable gastric banding (LAGB) was widely performed for one of weight loss surgery. Recently, band related long term complications discourage to select LAGB for bariatric surgery. LAGB related complications are known as band slippage, band erosion, intra-abdominal infection, port-site infection and port breakages. Gastric fundus and body necrosis due to adhesive band formed by fixation suture is rare condition, also laparoscopy-assisted lower esophageal sphincter preserving proximal gastrectomy is firstly performed. **Patient and Method:** 38 year old female who underwent LAGB on 5 years ago due morbid obesity (Height=159cm, 95.6kg, BMI = 37.8kg/m²) with related type II diabetes mellitus, visited emergency department due to uncontrollable severe epigastric pain followed by several times of vomiting. Her vital sign was followings, blood pressure 160/110 mmHg;

pulse rate 80/min; respiration rate 20/min, body temperature 36.4. On physical examination, recent her weight was 71kg and slight tenderness was observed on epigastric area without muscle guarding or irritation sign. On computed tomography, decreased enhancement of gastric fundus and body was observed suggesting band slippage. Therefore, emergency operation was performed.

Result: On operative finding, gastric fundus and body were prolapsed and severely compressed by adhesive band formed by band fixation suture between gastric body and cardia (Fig.1). In addition, band itself was located at the normal position. Firstly, adhesive band was released with ultrasonic device in laparoscopic view and then LAB-BAND was removed, then re-evaluation was performed to find viable portion to decide resection extent. Necrotic area involved gastric fundus and body preserving gastric cardia. For these reasons, lower esophageal sphincter preserving laparoscopy assisted proximal gastrectomy (LES-p LAPG) was performed. Operation time was 255 minutes and the patient recovered well and discharged at post-operative 8th day. During the follow up periods for 1 year, the patient had no symptom of reflux esophagitis.

Conclusion: Gastric necrosis due to adhesive band formed by LAB-BAND fixation suture was successfully managed with LES-p LAPG. LAPG can be an one of options for the management of gastric necrosis.

A5034

Laparoscopic Adjustable Gastric Banding (LAGB) After Failed Gastric Bypass; An Update of the Largest Canadian Case Series

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Introduction: For the patients with failed gastric bypass due to pouch dilation, LAGB can be considered for weight loss or improvement in obesity related co-morbidities.

Objectives: Safety, efficacy and outcomes of LAGB in this category of patients were studied.

Methods: Data of all the patients with a previous gastric bypass surgery, who underwent LAGB in our center from January 2011 to January 2015, were reviewed. Demographics, post-banding complications, BMI changes 18 months after the

revision, and the effect of banding on co-morbidities were analyzed.

Results: A total of 36 patients were selected for LAGB and data of 26 patients was included in the study. The average age of the patients was 49.5 (Median=46) years and the average interval between LAGB and bypass was 11 (Median= 8.5) years. The mean BMI before LAGB was 40.8 kg/m². Eighteen months after LAGB, the average BMI was 36.4 kg/m², with a %EWL of 26.6%. The reoperation had to be performed in 5 patients due to port flip. Diabetes resolved in 46%, sleep apnea improved in 53% and resolved in 27%, GERD improved in 50% and resolved in 50% of the patients and hypertension was better controlled in 12%.

Conclusion: LAGB is a safe, feasible and effective revisionary procedure for failed gastric bypass secondary to dilated pouch.

A5035

A prospective, international, multi-center, non-randomized, open label study (HERO) of health outcomes and the rates of explants and reoperations after 5 years of treatment with laparoscopic adjustable gastric banding

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Background: In the 15 years that laparoscopic adjustable gastric banding (LAGB) has been approved in the U.S. there have been advances in the technology, surgical technique, and aftercare that have led to clear improvements in health outcomes and reductions in explants and reoperations.

Objectives: The aim of the prospective HERO study (HERO-001 protocol) was to evaluate weight, co-morbidities, health-related quality of life (HRQOL), and safety after 5 years of follow-up. More recently the U.S. FDA approved analysis of a subset of HERO subjects (HERO-002 protocol - U.S. and Canada) to examine in rates of removals and reoperations. The current labeling dating from 2001 details a 7.9% annual rate of explants with a cumulative 39.4% over 5 years. We will present the 5-year data from U.S. and Canadian centers.

Design: HERO is a prospective international multicenter study over 5 years.

Methods: Data, including demographics, medical history, physical examination, laboratory evaluations, concomitant medication use, adverse events, clinical and an array of patient-reported outcomes were collected at baseline (pre-surgery), peri-surgery, and at follow-up visits at 3 months, 6 months, 1 year, and then annually through year 5.

Results: 626 U.S. and Canadian subjects were followed under the HERO-002 protocol. Full results will be available for presentation at Obesity Week after database lock on June 10, 2016. In addition to the primary safety objective of explants and reoperations, weight, comorbidity and patient reported outcomes will be detailed. Complete 4-year U.S. analysis indicates that band retention of 92.8% (90.3%-94.7%) a trend much lower than a loss of 39.4% at 5 years. Thus it is expected that the primary outcome measure will be easily achieved.

Conclusion: Detailed health and safety outcomes of LAGB surgery will be presented. 4-year data suggest the primary outcome measure of lower LAGB explants will be easily obtained.

A5036

Weight loss following bariatric surgery in young female patients

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Background: Rates of obesity are increasing rapidly among young patients and nonsurgical methods of treating this epidemic are largely ineffective in this population. Bariatric surgery has proved to be safe and effective even in prepubertal children for weight loss and resolution of obesity associated comorbidities such as diabetes. However, these benefits have to be weighed against the risks of bariatric surgery including operative complications and post-operative micronutrient deficiencies. There is a scarcity of literature examining weight loss over time associated with bariatric surgery in young patients as compared to their older counterparts.

Objective: The objective of this study is to determine whether a difference exists in weight loss following bariatric surgery in female patients who are less than or equal to 25 years of age and those greater than 25 years of age at the time of bariatric surgery.

Setting: University Hospital

Methods: Our institutional database was queried for premenopausal women <50 years old who had

bariatric surgery between 01/2012-04/2015. Information regarding type of surgery was obtained for each patient. These patients were divided into two groups, those less than or equal to 25 years of age and those greater than 25 years of age at the time of bariatric surgery. Preoperative weight and height were collected and BMI was calculated. Weights were measured at time periods: 30 days (20-40 days were accepted), 90 days (60-120 were accepted), 180 days (121-240 days were accepted), 360 days (270-450 days were accepted) and 720 days (630-810 days were accepted) following surgery. Percent weight loss, change in BMI and percent excess BMI lost was calculated for each of these time periods and the means for each group were obtained. A t-test was run and p-values were obtained for each time period, with p values < 0.05 considered as statistically significant.

Results: 253 patients ≤ 25 years old (15.9%) and 1337 patients > 25 years old (84.1%) underwent bariatric surgery during this time period. Of these, approximately 10% underwent gastric band, 66% underwent sleeve gastrectomy and 24% underwent Roux-en-Y gastric bypass. Initial BMI was 43.86/41.97 ($p < .0001$) for these groups, respectively. Table 1 shows the mean change in BMI, percentage weight loss and change in excess BMI for each group at 30/90/180/360/720 days following surgery. Figure 1 shows the change in BMI in these two groups over time. BMI was similar for these two groups at 30, 90 and 180 days ($p = .23, .45, .12$). However, after 180 days, the two groups diverge and the difference in BMI becomes statistically significant at 360 and 720 days ($p = .0083, .0304$), with the younger patients experiencing greater weight loss over time. A similar pattern is observed in the % weight loss and the change in excess BMI between the younger and older groups at these time points (figure 2 and 3). Complications requiring re-admission, including infection, small bowel obstruction, and dehydration, were similar in both groups (5.14% in ≤ 25 years vs. 6.96% in > 25 years).

Conclusion: Though both groups had the same initial rates of weight loss, the change in BMI, change in excess BMI and % weight loss for the two groups began to diverge after 6 months postoperatively. The younger cohort continued to lose weight, whereas the older cohort not only plateaued but actually regained some of the weight that had been lost at 2 years. Though a notable limitation to this study is that we only included premenopausal females, this patient population accounts for the majority of bariatric operations so we believe it is a

valuable cohort to examine. We conclude that bariatric surgery is more effective for weight loss in younger patients when compared to their older counterparts. These surprising results suggest that patients should be encouraged to undergo bariatric surgery at a younger age and not to delay their surgeries until they are older, as younger patients have greater and more sustained weight loss associated with bariatric procedures. We look forward to future research examining long-term weight loss, rates of complications, and resolution of obesity-related disorders in this population.

A5037

Integrated Pediatric and Adult Hospital Adolescent Bariatric Surgery Program: Our Paradigm for Robot-Assisted Sleeve Gastrectomy in Adolescent Patients with Morbid Obesity

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Introduction: Morbid obesity in adolescent patients is rising in prevalence. Bariatric surgery has demonstrated efficacy in the management of the obese adolescent patient. While there are multiple potential modalities of bariatric surgery, the role of robot-assisted sleeve gastrectomy (R-SG) in the adolescent patient is not well defined. As a collaboration between the Hospital of the University of Pennsylvania (HUP) and The Children's Hospital of Philadelphia (CHOP) we have developed an integrated care model for adolescents with obesity. Through this model we are effectively able to tailor care to the needs of the adolescent patient, and ensure adequate and extensive nutritional, psychosocial and surgical support.

Methods: Beginning in 2013 as a collaboration between HUP and CHOP, the Healthy Weight Clinic Adolescent program seeks to identify adolescent patients (ages 16-22) who would benefit from a multimodal approach to weight loss. This program includes medical weight management with pediatric nutritionists, gastroenterologists, psychologists, and endocrinologists, as well as consultation with

bariatric and pediatric surgeons for those who meet standardized criteria. After an intensive trial of medical weight management, as well as extensive preoperative counseling, ideal patients are identified to undergo bariatric surgery as a collaborative surgical effort between HUP and CHOP. In this cohort consideration was given to the various bariatric procedures, and the R-SG was selected given the short recovery time, favorable outcomes, and programmatic familiarity with the surgical procedure. Post-operatively, the patients are followed by the HUP and CHOP surgical services and are followed long-term by the Healthy Weight Clinic. A retrospective chart review of 9 subjects who received R-SG between 2013 and 2016 at our two collaborative institutions was conducted. Data collected included demographics, body mass index, comorbidities, pre-operative medical weight loss, hospital length of stay, procedure time, 30-day weight loss, and complications within 30 days.

Results: During the collaboration period, nine R-SG were performed in adolescents ranging in age from 16-21 years, with a median age of 18. Eight of the nine patients were female. Preoperative mean BMI was 50.7 kg/m² (41.0-60.5). Preoperative excess body weight was, on average, 37.1 kg, with a range of 24-48kg. Preoperatively, six patients had obstructive sleep apnea, two had dyslipidemia and one had polycystic ovarian syndrome. Preoperatively, each patient was seen and managed in the Healthy Weight Clinic at CHOP. They were seen an average of 12 times prior to surgery. Each visit included appointments with a medical weight loss physician and dietician, who evaluated the patient across multiple domains, including dietary habits, exercise, co-morbidities, and behavioral health. Each adolescent was seen in the behavioral health clinic, and average of 12 times (range 6-17 visits), which assessed psychosocial stressors, potential barriers to weight loss, and provided coping mechanisms for the perioperative period. In addition, each patient was assessed for their potential postoperative compliance with a trial of appropriate fluid and protein intake. All patients underwent surgery with one surgical team, consisting of a gastrointestinal bariatric surgeon and a pediatric surgeon, with a mean operative time of 99.1 minutes, with a range of 72-128 minutes. No patients suffered from intraoperative complications, and all were discharged on post-operative day three. No patients had major early complications as defined by prolonged hospital stay (>7 days), administration of an anticoagulant, re-intervention

or reoperation. One patient had an early minor complication, as they were diagnosed with a gastric stricture, which has been effectively treated with endoscopic dilation. Mean percent of total weight loss at one month post-op was 8.85% (range 6.6-10.8%). Mean change in BMI at one month post-op was 4.16 kg/m² (range 2.22-7.15). Mean percentage excess weight loss (%EWL) at one month post-op was 15.63%. Subsequent data regarding %EWL is presented, by patient, in Figure 1.

Conclusion: Our results compare favorably to a recently published series of comparable 14 R-SG adolescents with similar mean change in BMI (5.0 kg/m² in their series v. 4.16 kg/m² in ours), %EWL (18% in their series v. 15.63% in ours), and length of stay (5.6 days in their series v. 3 in ours). Integrating care between a major pediatric hospital and an adult bariatric surgical service provides a strong paradigm for pre- and post-operative care of the adolescent patient with obesity. Utilizing a multimodal approach to managing this unique patient population, we are able to fully attend to the needs of the adolescent patient. The availability of pediatric nutritionists, endocrinologists, and surgeons allows for specific, high impact counseling regarding micronutrient deficiencies, medical weight loss, and the psychosocial stressors that frequently occur post-operatively. Also, owing to the rare nature of these operations, maintaining collaboration with a high-volume adult bariatric surgical service allows for close follow up of surgical issues that may arise. Our short term data for R-SG in adolescent patients demonstrates that it is a safe and well-tolerated procedure with encouraging short term weight loss.

A5038

NUTRITIONAL and METABOLIC STATUS of 96 ADOLESCENT PATIENTS BEFORE and 1 YEAR AFTER SLEEVE GASTRECTOMY: EVIDENCE FROM QATAR
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RESPONSIBLE DR SAMA ABDUL RAZZAQ ASAL

Background: Obesity in adolescents is becoming more prevalent with serious health implications. Although obesity is typically associated with high caloric intake, nutritional deficiencies have existed in adolescents who are morbidly obese. This in part due to the high consumption of calorie- dense poor quality processed food. In recent years, Sleeve gastrectomy has emerged as an effective procedure for the treatment of morbid obesity in adolescents. It has a positive metabolic outcome and good safety

profiles that are comparable with what is seen in adults. However, few studies have addressed the nutritional and metabolic status of adolescents before and after bariatric surgery.

Objectives: The aim of the study is to assess the nutritional status of adolescents before and one year after sleeve gastrectomy at Hamad General Hospital, Doha, State of Qatar.

Method: Retrospective review of 96 obese adolescents who underwent laparoscopic sleeve gastrectomy at our institution during 2011-2014. We evaluated these adolescents for the prevalence of macro and micronutrient deficiencies prior to the sleeve gastrectomy, and one year thereafter. Our assessment included albumin, iron, folic acid, vitamin B12, vitamin D, calcium, copper, magnesium and zinc deficiencies. In addition, we also measured hemoglobin and parathyroid hormone.

Results: Mean age of the sample was 15.9 years, which comprised 52% males and 44% females. Preoperatively: Mean pre-operative Body mass index (BMI) was 46 kg/m². About 55.1% of these adolescents were anemic, and 11.5% and 6% had low serum iron and vitamin B12 respectively. Low vitamin D was present in 98.6% of the sample, and 2.7% had low calcium level. Hypomagnesiumemia was evident in 3.4% of the patients. Hyperparathyroidism related to vitamin D deficiency was present in 60% of the adolescents; and 5.5% had hypoalbuminemia. However, there were no deficiencies of copper, zinc and folic acid in these adolescents pre operatively. *Postoperatively* (1 year): Mean body mass index BMI was reduced to 28 kg/m². About 54.7% were anemic, 7.1% had low iron level. Vitamin B12 and vitamin D deficiencies were present in 20% and 89.1% of the patients respectively. Low calcium was evident in 2.4% of the sample, and Parathyroid hormone was elevated in 30% of the patients. Roughly 7.1% and 12.5% of the adolescents had low zinc and low copper levels respectively, and 14% exhibited hypoalbuminemia. However, no patients had folic acid or magnesium deficiency post operatively.

Conclusion: Some nutritional deficiencies and metabolic abnormalities had already existed in small proportions of the adolescents seeking bariatric surgery at Hamad General Hospital in Qatar. However there was minimal / non-significant worsening of these nutritional deficiencies one year post operatively, whether using the proportion of participants for comparison or using the mean levels of the nutrients. Sleeve gastrectomy is a safe bariatric procedure for treatment of obesity in

adolescents, however nutritional and metabolic surveillance both pre & post operatively are required to prevent any potential abnormal values. 1.

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A5039

Do malabsorptive procedures in adolescents offer better solutions for obesity in respect to weight loss and psychological outcomes?

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Introduction: Bariatric surgery is an effective method of treatment for adolescent populations with obesity. Transitioning through adolescence is characterized by intense psychosocial adjustment and development. The aim of this study was to evaluate the rate of change in the body mass index (BMI), depressive symptoms, self-concept, and body concept in adolescents undergoing malabsorptive procedures such as Roux-en-Y gastric bypass (RYGB) and Laparoscopic adjustable gastric banding (LAGB) before and after the first 12 postoperative months.

Methods: A systematic review was conducted identifying all relevant studies from 2006 - 2016 with comparative data on malabsorptive procedures in adolescents and psychological outcomes. The primary outcome was the rate of change in the body mass index (BMI). Secondary outcomes included improvement of depressive symptoms, self-concept, and body concept. The results were analyzed as standard difference in means with standard error. Statistical analysis was done using random-effects meta-analysis to compare the mean value of the two

groups (Comprehensive Meta-Analysis Version 3.3.070 software; Biostat Inc., Englewood, NJ).

Results: Four studies were quantitatively assessed and included for meta-analysis, which comprised of four prospective studies. There were a total of 84 RYGB patients and 101 LAGB patients. Malabsorptive procedures were associated with greater rate of change in BMI (2.049 ± 0.137; $p < 0.0001$) when compared to BMI before bariatric surgery. There was a significant improvement in depressive symptoms (1.246 ± 0.123; $p < 0.0001$) and self-concept (-1.782 ± 0.149; $p < 0.0001$) in adolescents who underwent RYGB and LAGB procedures. Adolescents exhibited a greater body concept after undergoing bariatric surgery when comparing two of the four studies (-1.204 ± 0.224; $p < 0.0001$).

Conclusions: Adolescents experienced notable improvements in BMI, depressive symptoms, self-concept, and body concept after RYGB and LAGB procedures.

A5040

Short-Term Weight Loss Following Sleeve Gastrectomy in Adolescents with Morbid Obesity vs. Super Obesity

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Introduction: Sleeve gastrectomy is becoming the weight loss operation of choice for highly selected children and adolescents with severe obesity. We reviewed weight loss results among our patients who underwent weight loss surgery to evaluate the efficacy of the procedure in patients with body mass index (BMI) $< 50 \text{ kg/m}^2$.

Methods: We conducted an IRB-approved record review of weight loss and change in BMI in all patients (N = 118) who underwent laparoscopic sleeve gastrectomy (SG) at our center between 2010 and 2015. Charts were reviewed for change in weight (kg) and BMI (kg/m²), and percent excess body weight was calculated based on a BMI of 25 for all patients < 18 years and calculated excess body weight based on weight in kg > 85 th percentile BMI for age. Patients were divided pre-operatively into Group 1 (those with BMI < 99 th %ile-BMI for age and $< 50 \text{ kg/m}^2$) and Group 2 (those

with BMI $> 50 \text{ kg/m}^2$). Results were measured at 6, 12, and 18 months.

Results: 83 patients (61 F, 22 M) with mean age 17.0 years and BMI $< 50 \text{ kg/m}^2$ underwent sleeve gastrectomy, while 35 patients (21 F, 14 M) with mean age 17.2 years and BMI $> 50 \text{ kg/m}^2$ did as well. The mean initial BMI was 45.3 ± 5.2 kg/m² in Group 1 and 61.6 ± 10.9 kg/m² in Group 2. Post-operative BMI and % weight loss is shown in Table 1.

Conclusions: Patients with morbid obesity undergo progressive weight loss during the initial 18 months following SG regardless of their starting weight and BMI. Percentage of total weight lost is not significant between the groups; however, a significant difference remains when BMI is compared. The relevance of BMI vs percent weight loss to health improvement remains to be determined.

A5042

The relationship between physical activity and long-term BMI reduction in adolescent bariatric surgery – A report from the Follow-up of Adolescent Bariatric Surgery at 5+ years (FABS5+) study

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Background: Although physical activity (PA) is a critical component of weight loss maintenance in general, its importance following Roux en Y gastric bypass (RYGB) surgery among adolescents is unknown. Our objective was to characterize current PA levels among RYGB recipients and nonsurgical controls, and to evaluate the relationship between dose of PA and long-term BMI change.

Methods: The Follow-Up of Adolescent Bariatric Surgery at 5+ years (FABS5+) study was designed to evaluate changes in a broad spectrum of outcomes in participants who underwent obesity treatment as adolescents. A one-time study visit was conducted to collect long-term (≥ 5 yr) outcomes from an adolescent RYGB cohort and a nonsurgical, contemporaneous comparison cohort that received standard pediatric weight management treatment. PA data were gathered using the International Physical Activity Questionnaire (IPAQ). Linear regression was used to evaluate the association between current PA (hrs/wk) and % BMI change from baseline.

Results: 58 RYGB and 30 controls participated in the long-term follow-up visit (mean f/u time: 7.5yrs). Groups were similar by sex and ethnicity, but RYGB participants were older, more likely to be white, and had higher baseline BMI (59 vs 52 kg/m²). Median self-reported physical activity at follow-up was 8.2 hrs/wk for RYGB and 6.4 hrs/wk for controls ($p=0.38$); BMI change was -29% for RYGB participants and +8% for controls ($p<0.01$). Adjusted regression analysis indicated RYGB participants had significantly higher %BMI change compared to controls ($p<0.01$). An interaction was present between PA and sex, such that increasing PA was associated with increasing %BMI change for females ($p<0.01$), but not males ($p=0.58$).

Conclusions: At mean follow-up of over 7 years, RYGB participants reported non-significantly higher amounts of PA than controls, and as expected, lost a higher percentage of BMI from baseline. For both cohorts, higher levels of PA are associated with superior long-term BMI outcome in females but not males.

A5043

“Factors that Influence Blood Pressure Following Bariatric Surgery”

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Background:The effect that bariatric surgery may have on blood pressure (BP) of hypertensive and non-hypertensive patients is not well understood. In this study we aim to examine the predictors of postoperative (postop) systolic and diastolic blood pressure values in the bariatric population. **Methods:**We studied all patients who had vertical sleeve gastrectomy (VSG) or gastric bypass (GBP) surgery at our institution between the years 2013 and 2015. Two linear regression models were constructed to analyze the predictors of postoperative: (A) Average systolic pressure readings; and (B) Average diastolic pressure readings (across multiple follow up clinic visits). Out the 22 clinical covariates considered for inclusion, the regression models controlled for age, sex, comorbidities (diabetes of any type, hypertension,

sleep apnea), type of surgery (SVG vs GBP), approach (laparoscopic vs open), body mass index (BMI) at preoperative (preop) clinic visit, maximum weight loss achieved on latest follow up (in kg), preop diastolic and systolic blood pressure measurements (in mmHg).

Results: A total of 616 patients had VSG (64%) or GBP (36%) between 2013 and 2015. Mean patient age was 44.8 years \pm 12 SD and 22% were male. The average diastolic and systolic pressures for patients were 79 \pm 11 and 134 \pm 16 mmHg, preoperatively; and 75 \pm 10 and 124 \pm 16 mmHg, on latest postoperative follow-up. Mean and median follow up times for the studied cohort were 9.2 and 8.8 months (range 0.2, 36), respectively. Age above 60 years-old had a strong positive association with higher systolic blood pressure after surgery despite adjustment for confounders (OR 6.43, 95% CI 2.62-10.23, $P=.001$). For each additional BMI unit at preop visit, postop systolic BP increased by 0.25 mmHg (OR 0.25, 95% CI 0.12- 0.38, $P=.0001$). Having sleep apnea (decrease of 3.4 mmHg) and weight loss (decrease of 0.05 mmHg per Kg) were both negatively associated with postop systolic BP (both $P<.05$) (Table). Male patients had on average 4.5 mmHg increased postop diastolic BP compared to their female counterparts (OR 4.51 95%CI 0.56- 8.47, $P=.025$), while each unit increase in BMI at preop clinic visit positively correlated with 0.23 mmHg increase in diastolic BP at postop clinic visit (OR 0.23 95% CI 0.02-0.43, $P=.030$).

Conclusion:Age greater than 60 is positively correlated with higher systolic BP after bariatric surgery. Having a higher BMI at preoperative clinic visit correlates with higher systolic and diastolic BP postoperatively. Patients who have preoperative sleep apnea and those who achieve better weight loss following surgery are likely to have lower postop systolic readings. Intervening with bariatric surgery at a younger age results in a more favorable postoperative BP profile. This may lead to less target-organ damage.

A5044

Outcomes of RYGB in Patients with Pulmonary Fibrosis and GERD

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Introduction: Severe gastro-esophageal reflux disease (GERD) is one of the important causative factors for development of pulmonary fibrosis (PF) and relative contraindication for lung transplantation due to high rate of graft failure. Currently, there is minimal literature regarding outcomes after Roux en Y gastric bypass (RYGB) in patients with PF and GERD. The aim of this study was to assess the perioperative outcomes, postoperative pulmonary functioning and GERD changes after (RYGB).

Methods: After IRB approval, patients with preoperative diagnosis of PF and GERD who underwent RYGB from 2006-2015 were retrospectively reviewed. Data collected included demographics, baseline co-morbidities, perioperative data and postoperative outcomes. Pulmonary fibrosis was defined as clustered cystic air spaces between 3-10mm in diameter (honeycombing as defined by Fleischner Society) as per high resolution computed tomography (HRCT). Data was summarized as medians for continuous variables and as counts with percentages for categorical variables.

Results: A total of 12 patients with PF underwent laparoscopic (n=11) or open (n=1) RYGB. Ten (83.3%) patients were female; median age was 46.9 (IQR 41.1 -56.8) years and median BMI was 38.8 kg/m² (IQR 35.6 -46). Baseline co-morbidities included: GERD (n=9, 75%), hypertension (n=2, 16%), hyperlipidemia (n=4, 33.3%), obstructive sleep apnea (n=5, 42%), chronic obstructive pulmonary disease (COPD) (n=1, 8.3%), asthma (n=4, 33%), pulmonary embolus (n=2, 16.7%) and renal insufficiency (n=1, 8.3%). Median operative time was 143.0 minutes (IQR 134.5-184.0) and the length of stay 3.5 days. The 30-day major complications were reported in 4 patients with 1 major complication, leak required surgical intervention and prolonged hospitalization. There was no mortality. Pulmonary function test was performed for all patients preoperatively and the results were FVC 57% (IQR 48.50-73.50), FEV1/FVC 92% (IQR 70.34-110.5) and Diffusion capacity of lung for carbon monoxide (DLCO) (n=9) 54 (IQR 47- 63). At one year follow 4 patients were followed with PFT and values were FVC: 66% (IQR 54 - 75.25), FEV1/FVC : 107.50 (IQR 77- 113.25) and DLCO 66.5 (IQR 58.25- 74.5). Effects of RYGB procedure on patients with GERD symptoms were followed in 7 patients as subjective complete resolution (n=2), subjective improvement (n=4) and no changes (n=1) in one year follow up. One patient received lung transplant and developed pulmonary fibrosis in

transplanted lung before RYGB procedure. Postoperatively, 3 patients were approved for lung transplant and one of these patients was removed from the list due to improved lung function after RYGB.

Conclusion: Roux-en- Y gastric bypass is relatively safe in patients with pulmonary fibrosis and GERD and results in subjective improvement in GERD symptoms. Effect on pulmonary function requires further analysis. Key Words: Roux en Y gastric bypass, Pulmonary fibrosis, Gastroesophageal reflux

A5045

A Pilot Study Comparing Abdominal CT vs MRI for the Evaluation of Abdominal Pain after Gastric Bypass

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Background: Gastric bypass patients (GBP) are frequently subjected to ionizing radiation (IR), sometimes during upper GI swallow studies (UGI) but more often with computerized tomography (CT) to evaluate internal anatomy. About 30% of GBP present emergently in the postoperative period, over half of them for central abdominal pain (Cho et al. 2008, Greenstein et al. 2011). The current gold standard study for this is CT of the abdomen and pelvis, subjecting patients to 8-15 mSv of IR. The average adult living in the United States (US) receives an estimated 3 mSv per year in background radiation, and another 3 mSv per year from medical procedures. (Mettler et al. 2008). The BEIR (Biological Effects of Ionizing Radiation) VII model for lifetime risk of developing cancer from low-level IR estimates that 1/1000 people exposed to 10 mSv of IR will develop cancer in their lifetime (Semelka et al. 2007). This may place GBP at significantly higher than average risk for the development of future cancers. Magnetic resonance imaging (MRI) uses radio waves, non-ionizing electromagnetic radiation. There is often overlap between CT and MRI diagnostic images. In this pilot study we aimed to determine whether concurrent CT and MRI for GBP presenting with abdominal pain would be sufficiently similar to allow a recommendation that the preferred standard be MRI.

Methods: After IRB approval, and receipt of a grant to cover the costs of MRI scanning, enrollment was opened for all laparoscopic GBP of a single academic surgeon. GBP seen in clinic for chronic, recurrent

central abdominal pain with no identifiable cause (e.g. absent gallbladder or no biliary symptoms to indicate biliary ultrasound or functional scanning) were first electively scanned with conventional CT with oral contrast, paid for by insurance coverage, followed by abdominal protocol MRI, covered by our grant, on the same day. If there was a finding on either study mandating urgent operation, the study protocol included correlating intraoperative and imaging findings. Eight GBP were enrolled and scanned. Each CT was interpreted by a dedicated body-imaging radiologist (BIR). MRIs were separately evaluated by another BIR, blinded to the identity of the GBP or the CT results. Both readings were reviewed by the research team to determine if there were significant diagnostic differences between modalities.

Results: All study patients were female, mean age 46, and had undergone laparoscopic Roux-en-Y gastric bypass by the same surgeon with an identical technique (antecolic, antegastric, total linear stapled anastomoses, alimentary limb length between 100 and 150cm depending on BMI, with suture closure of all internal hernia defects). The mean time after bypass was 60.9 months (range 26.2-101). Results of the CT and MRI scans of the eight patients are collated in Table 1. The mean IR dose conferred was 11.19 mSv, amounting to about twice the IR an average US adult receives. All patients were shown to have normal post-gastric bypass anatomy by CT as well as MRI, thus excluding leaks, evidence of internal hernia, lengthened blind limbs, intussusception, etc., in all patients. Based on this, no patients underwent operative procedures. Six patients had additional CT findings that lead to the need for multiple additional interventions, including colonoscopies, upper endoscopies, specialist consultations, and interval CT scans, none of which revealed any significant findings nor led to further treatment. Four patients had additional MRI findings; none of these required further evaluation except for one finding of pancreatic cysts for which an interval MRI was recommended.

Conclusions: CT is currently the gold standard study for emergent evaluation of GBP with abdominal pain because of its ready availability at all hours, no contraindication for patients with metallic implants or shards, and no significant issue with claustrophobia because of the more open environment. However, both CT and MRI may be equally useful studies for the elective evaluation of nonspecific abdominal pain after gastric bypass. Insurance coverage for CT scans is almost universal,

while precertification for MRI studies generally requires another level of approval. In our pilot study, the evaluation of post-bypass anatomy was identical between the two modalities. Additional incidental findings were more common after CT, and mandated additional work-up, some of which entailed even more IR, but further evaluation never led to significant findings. While the cost of MRI is somewhat higher than the cost of CT, the additional medical investigations necessitated by the CTs made the CT-related cost of care overall much higher. We suggest that MRI may be a superior modality for the elective work-up of GBP with undifferentiated central abdominal pain, not only because of the lack of IR, thus conferring no additional cancer risk, but because it may be equivalently diagnostic and overall more cost effective. We hope to pursue funding for a larger study to look for significant differences or similarities between the two modalities.

A5046

Predictors of Failed Weight Loss at 10 Years Following Roux-En-Y Gastric Bypass

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Background: Roux-en-Y gastric bypass (RYGB) is known to have excellent short and intermediate-term outcomes by inducing durable weight loss and comorbidity amelioration. Unfortunately, in the long-term there is a subset of patients with late failure who return to their preoperative body mass index (BMI). The aims of this study were to identify predictors of failure to lose weight at 10 years following RYGB and analyze the impact of late failure on health improvement.

Methods: Adults (median age 41y, BMI 51.5 kg/m², 82.5% female) undergoing bariatric surgery between 1985 and 2004 at a single institution were included in this study. Late failure was defined as >0% reduction in excess BMI (%REBMI) 10 years after surgery. Univariate analysis characterized preoperative and long-term outcomes stratified by late failure. Multivariate linear regression was utilized to identify preoperative predictors of 10-

year %REBMI and multivariate logistic regression for late failure.

Results: Complete follow up was available for 620 patients alive at 10 years (57%). The median %REBMI was 57.4% and late failure occurred in 10.2% of patients at 10 years. Patients with late failure had significantly lower preoperative BMI, more frequent cardiac comorbidities and gastroesophageal reflux disease (GERD), were more frequently female and less likely to have governmental insurance (all $p < 0.05$). Among patient with successful long-term weight loss all comorbidities decreased in prevalence (all $p < 0.0001$). Surprisingly, all comorbidities also decreased for patients with late failure (all $p < 0.05$). Significant independent predictors of 10-year %REBMI include BMI, gender and government insurance status (Table 1). Adjusted risk factors for late failure include lower preoperative BMI, nongovernmental insurance, increasing travel time to hospital, and non-Caucasian race (Table 1). Non-governmental insurance (OR 2.02, $p = 0.0380$) and non-Caucasian race (OR 2.17, $p = 0.0394$) conferred the highest adjusted odds of late failure.

Conclusions: A small but significant number of patients can be expected to fail to maintain weight loss in the long-term. While many variables interplay to result in durable weight loss, independent preoperative risk factors for failing to lose weight at 10 years include lower BMI, non-Caucasian race, non-governmental insurance and longer travel time to the hospital. Further research is warranted to evaluate both clinical and policy implications of travel time and insurance status on risk for failing to lose weight. It is extremely encouraging that even patients with late failure have improvement in comorbidities.

A5047

LONG-TERM OUTCOMES AFTER SINGLE ANASTOMOSIS (MINI-) GASTRIC BYPASS

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Background: Laparoscopic single anastomosis (Mini-) gastric bypass (LSAGB) is a simplified gastric bypass procedure but long-term data is not available. Hence, this study is to report the long-term outcome of LSAGB as primary bariatric procedure.

Methods: With retrospective analysis of a prospective bariatric database, participants who defaulted clinical follow-up were interviewed by telephone. A total of 595 LSAGB was performed as primary bariatric procedure (2001-2005) with mean age of 39.5 \pm 9.7 years old, female 70.1%, mean body mass index (BMI) 39.3 \pm 8.1 Kg/m².

Results: There were 262 (44%) patients available with long-term data $>$ 10 years. Among them 8 patients deceased with a all cause mortality of 3.0% and 46(17.6%) needed surgical revisions due to malnutrition (n=33), weight regain (n=7) and intolerance (n=6). Mean percentage excess weight loss (%EWL) was 73.5% at $>$ 10years. Remission of co-morbidities was 35% for Hypertension, 70% for Hyperlipidemia, 93.3% for Diabetes Mellitus. Nutritional deficiencies were seen in 93% of patients. LSAGB had a better weight loss and less chance of revision surgery compared to reported RYGB long-term data.

Conclusion: LSAGB appears to be an effective bariatric surgery with non-inferior performance than RYGB. However, nutritional deficiencies are universal and requires long-term follow-up.

A5048

Long-term Outcomes of Totally Robotic Roux-en-Y Gastric Bypass: A Ten-year Series

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Introduction: Roux-en-Y gastric bypass (RYGB) is an effective treatment for morbid obesity and related comorbidities. RYGB is most often performed laparoscopically, although the robotic RYGB is the preferred approach for an increasing number of bariatric surgeons. Compared to laparoscopy, the robotic system allows the surgeon better ergonomics and three-dimensional vision. Few long-

term studies exist in regards to robotic RYGB patient outcomes.

Purpose: To retrospectively investigate the long-term results of robotic RYGB using the daVinci robot system by a single surgeon.

Methods: All patients who underwent totally robotic RYGB between January 1, 2006 and March 30, 2016 were included. Demographic data, preoperative weight, BMI, and comorbidities were collected on all patients. Outcomes included operative times, conversion rate, length of stay, complications, resolution of comorbidities, rates of re-operation, readmission, and mortality. Postoperative weights and percent excess body weight lost (%EBWL) were tracked at 3-month intervals for 18 months, then yearly for 5 years. Paired t-tests were used to compare pre- and postoperative lab results, mixed effects model was used to analyze weight change over time, and Loess curve was utilized to project weight loss trajectory. ANOVA and Fisher's exact tests were used to compare continuous and categorical outcomes between daVinci generation, respectively.

Results: Totally robotic RYGB was performed in 198 patients across four generations of daVinci robot (58 Standard, 88 S, 35 Si, 17 Xi). Eighteen percent were male and mean age was 41.7 +/- 10.1 years. All patients met National Institute of Health criteria for bariatric surgery and initiated a comprehensive integrated nutrition and exercise program for at least six months pre-operatively, followed by a bariatric nurse. Average preoperative BMI was 45.9 +/- 6.7; 57.6% categorized as having morbid obesity and 22.7% as having severe obesity. EBW of 136.3 +/- 42.7 pounds. Nineteen percent had one preoperative comorbidity, 22.7% had two, and 41.9% had greater than two. Thirty-five percent were diagnosed with diabetes mellitus, 2.5% with coronary artery disease, 44.4% with hypertension, 26.8% with hyperlipidemia, 39.9% with obstructive sleep apnea, 31.3% with gastroesophageal reflux disease, and 42.4% with a psychological disorder. One patient had failed a trial of a previous weight loss surgery (gastric band), which did not result in any issues during the procedure. Overall mean operative time was 188.5 +/- 41.0 minutes (median 180 minutes) and mean robotic operative time was 145.2 +/- 37.6 minutes (median 139 minutes); mean times decreased significantly with surgeon experience and evolution of the robotic system ($p < 0.0001$). Eight cases were converted to laparoscopic or open (6 Standard, 1 S, 2 Si, 0 Xi; $p = 0.10$). One case was aborted due to extensive

adhesions from a previous abdominal procedure. Comparison of the daVinci generations demonstrated shorter OR times, daVinci times, and fewer conversions in later generations. The surgeon reached a plateau of his learning curve within 59 cases. Average length of stay was 3.2 +/- 4.5 days. Six patients returned to the OR on initial admission. Eleven patients were readmitted within one month of the procedure: 2 with anastomotic leak requiring re-operation. The other readmitted patients' problems resolved with conservative management (electrolyte disturbances, abdominal pain or nausea, pneumonia, small bowel obstruction). Average follow-up was 3.63 +/- 2.48 years (up to 9.82 years); however, 28 patients had follow-up for less than one year and 70 patients had less than 2 years. Less than 19% of patients experienced a minor complication: 10.1% Clavien-Dindo (CD) class I, 7.6% CD class II. Twenty percent of patients experienced a major complication: 18.2% CD class III (re-operation or endoscopic intervention) and 2.0% CD class IV (ICU admission). There were no deaths. Over the length of follow-up, the most common major complication was internal hernia (8.1% of patients), followed by marginal ulcer (5.6%), anastomotic site leak (5.1%), small bowel obstruction without internal hernia (2.0%), and stricture of anastomosis (1.0%). No patients experienced a thrombotic event. There was no difference in complication rate between generations of robot. Over 60 months of follow-up, weight loss results followed the expected curve seen after RYGB in other series. Patients' weight decreased significantly from baseline to 9 months, plateaued, and reaching a nadir at 24 months. Mean EBWL at 18-24 months was 59.4% +/- 31.5%. Significant weight gain then occurred between 48 and 60 months. Of patients who had preoperative labs performed, they demonstrated a significant improvement in hemoglobin A1c ($p = 0.0009$), LDL ($p = 0.0003$), triglycerides ($p = 0.006$), and cholesterol levels ($p = 0.008$) after surgery.

Conclusions: Outcomes using robotic technology for bariatric RYGB are excellent. This study documents results of one surgeon using four generations of daVinci robot from a single institution showing resolution of preoperative obesity-related comorbidities, no mortality, and acceptable morbidity. The precision of robot has been shown to aid in the most technical aspects of advanced bariatric procedures and has great potential in the future of surgical weight loss.

A5049

MORBID AND MORTALITY AFTER 11,146 CONSECUTIVE LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASSES PERFORMED BY A SINGLE GROUP IN ARGENTINA.

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Background: Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) is the gold standard to treat severe obesity but it is a complex procedure not exempt of complications. This study aimed to assess the mortality and complications of LRYGB.

Methods: We performed a retrospective review of a prospectively collected database (iZenMed©). Between April 2003 and April 2016 11,146 consecutive patients underwent LRYGB for severe obesity. Data including patient's demographics, operative time, conversion rate, length of hospital stay, previous abdominal surgeries, mortality and complications. Outcome data are expressed in mean, range and SD. Microsoft Excel© were used for statistical analysis.

Results: The mean age was 41.9±10.9 (15-75) years, 67.3% female, while the mean initial body mass index (BMI) was 45.1±7 (30- 114.3) kg/m². After the first 150 cases the mean operative time was 94±15.1 minutes. The conversion rate was 0.06%. The median hospital stay was 48 (48-1,084) hours. Previous abdominal surgeries was present in 44.36%. The 30-day rate of death was 0.05% and between 31 to 100 day the mortality rate was 0.05%. Early (30 days) major adverse outcome rate was 3.28% (leak 1.13%, GI bleeding 0.56%, intra abdominal bleeding 0.23%) and the late complication (after 30 days) rate was 13.85% (cholelithiasis 4.4%, vitamin and iron deficiency 6.55%, GJ stricture 1.15%, marginal ulcer 0.9%, bowel obstruction 0.68%, internal hernia 0.4%).

Conclusion: The overall risk of death and other adverse outcomes after LRYGB was low, similar to those reported from other major centers. LRYGB operation is feasible and safe in unselected morbidly

obese patients, when it is performed in a high-volume bariatric center.

A5050

Laparoscopic Roux-en-Y gastric bypass: outcome of 956 cases after training in a high volumen center.

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Background: Laparoscopic Roux-en-Y gastric bypass (LRYGB) remains a technically challenging with significant risk for morbidity and mortality. Several reports have described the importance of training to reduce complications. AIMS: The aim of this study was to evaluate the impact of training in a high volumen center on morbidity mortality and outcomes (MMO) of LRYGB. MATERIALS AND

Methods: Retrospective review of a prospectively collected database (iZenMed©). Were analyzed all consecutive patients underwent LRYGB for severe obesity performed by P.M.D. between July 2012 and April 2016. P.M.D. was previously trained from 2009 in high volumen center by four experienced bariatric surgeons. Data including patient's demographics, operative time, conversion rate, length of hospital stay, previous abdominal surgeries, mortality, complications and percent of excess weight loss (%EWL). Outcome data are expressed in mean, range and SD. Microsoft Excel© were used for statistical analysis.

Results: A total of 956 patients were included. There were 70.5% women, with a mean age of 41.3±10.7 (16-67) years, while the mean initial body mass index (BMI) was 43.7±5.8 (29.9-77) kg/m². After the first 150 cases the mean operative time was 97±15.1 minutes. There was no conversion. The median hospital stay was 48 (48-240) hours. Previous abdominal surgeries was present in 51.9%. There was no mortality. Early (30 days) major adverse outcome rate was 4.39% (leak 1.2%, GI bleeding 0.73%, intra abdominal bleeding 0.4%) and five (0.5%) patients were reoperated (1 leak, 2 intra-abdominal bleeding, 2 partial intestinal obstruction). The late (after 31 days) complication rate was 11.8% (cholelithiasis 1.1%, vitamin and iron deficiency 4.6%, GJ stricture 1.04%, marginal ulcer 0.5%, bowel obstruction 0.3%, internal hernia 0.2%). The %EWL

at six month was 80.1%, at 1st year 90.4%, 2nd year 87.2% and 3er year 86.2%.

Conclusions: The perioperative complications and outcomes are comparable with those reported by experienced surgeons. Training in a high volumen bariatric center ensured skills acquisition for new surgeons to safely and effectively perform LRYGB which is one of the most complex bariatric procedure.

A5051

Roux-en-Y Gastric Bypass Following Nissen Fundoplication: Higher Risk Same Reward

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Introduction: Roux-en-Y Gastric Bypass (RYGB) has been shown to be effective in treating both obesity and gastroesophageal reflux disease (GERD). With more surgeons recommending RYGB to treat GERD in patients with obesity, there are concerns about the feasibility of this approach in patients with previous foregut surgery. We hypothesize patients with prior foregut surgery will be at higher risk for operative complications with no difference in long-term outcomes.

Methods: We analyzed the medical records for all patients undergoing RYGB between January 1985 and June 2015 to identify those patients with previous foregut operations. Patient data including preoperative demographic data, patient comorbidities, and characteristics of the initial foregut operation were collected. Perioperative data such as conversion from a laparoscopic to an open approach, extensive enterolysis, fundus resection, and the rate of perioperative enterotomy were recorded for each patient. Additionally, long-term GERD symptom resolution and weight reduction was documented using percent reduction in excess BMI (%EBMIL).

Results: A total of 11 patients (8 female, 3 male) were identified with foregut surgery prior to RYGB with a median time between interventions of 95.6 months. Of note, 7/11 (63.6%) patients had a previous Nissen fundoplication. Two patients had previous esophageal leiomyoma excision, one had a hiatal hernia repair, and one had an exploratory laparotomy with primary diaphragm repair after a gunshot wound. At the time of RYGB the average

age was 49.9 years, average BMI was 45.1 km/m², and 9/11 (81.8%) of patients had daily symptoms of GERD. For patients with a Nissen fundoplication, 3/7 (42.9%) required conversion to an open operation compared to 1/4 (25%) that did not have a previous Nissen fundoplication. All bariatric surgeries that converted to an open operation were done after 2003 when laparoscopic RYGB was well-established. During the operation, 5/11 (45.5%) patients required extensive enterolysis with significant adhesions noted in the operative report. The average length of stay (LOS) was 3.9+-0.9 days, which is significantly longer than our institutional average for RYGB 3.2+-3.2 days (p=0.02). However, mean %EBMIL in the study group was 64.7+-23.5 with a median follow-up of 4 years, which is comparable to our previously reported 74.7+-22.7 at two years, and 52.5+-33.8 at 10 years (p=0.62). The study population had no mortalities attributed to their foregut or bariatric operations with only 1/11 (9.1%) patients suffering from recurrence of GERD symptoms.

Conclusion: This study demonstrates that previous foregut surgeries make subsequent RYGB more technically difficult, with a high rate of conversion to an open operation and increased perioperative morbidity. However, patients have no long-term complications, maintain a robust %EBMIL, and have a significant reduction in GERD symptoms in the postoperative period. Therefore, while previous foregut surgery makes the operation more technically difficult, in experienced hands it is still feasible to perform safe and effective RYGB.

A5052

Comparison of Sleeve Gastrectomy and RYGBP Surgery % Excess Weight Loss Results: A single-bariatric center institution

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University of Miami¹

Background: It is estimated that more than one third of adults and about 17% of adolescents suffer from obesity. The health effects of obesity are myriad and include the development of type 2 diabetes, sleep apnea hypertension, cardiovascular disease, and high blood pressure. Surgical interventions, such as Roux-en-Y gastric bypass (RYGBP), gastric banding, and laparoscopic sleeve gastrectomy (LSG), have become more widespread that involve modifications to the digestive system to promote significant

weight loss to treat obesity and its associated health effects in adjunct with lifestyle changes.

Methods: Patients who had RYGBP and sleeve gastrectomy surgery at our institution between January 2008 and December 2014 were evaluated to determine the efficacy of bariatric surgery. The primary end-point was excess weight loss (EWL).

Results: 2323 patients were identified who had RYGBP or LSG surgery. 1628 patients underwent RYGBP (70% of patients) and 695 patients (30% of patients) underwent LSG. RYGBP patients were between the ages of 16 and 78 years old at surgery (avg. = 44.5 years), 71.8% were female and 28.2% were male. LSG patients were between 13 and 79 years old (avg. = 43.2 years), 72.5% female and 27.5% @ male. 70.7% of RYGBP patients had <u></u> two comorbidities compared to 73.6% of LSG patients. See Table 1 for comorbidity comparison. Post-up visits were completed at 1 week, 1 month, 3 months and every 3 months after. The average BMI for RYGBP patients was 46.8 and 45.7 for LSG patients. Average % EWL for RYGBP patients was 65% and 69.3% at year 1 and year 2 respectively. Average % EWL for LSG patients was 64.5% and 62.9% at year 1 and year 2 respectively. <u>Conclusions</u>:RYGBP and LSG have comparable weight loss benefits in a wide range of patients.

A5053

Outcomes of RYGB in Patients with Pulmonary Fibrosis and GERD

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Cleveland Clinic Foundation¹

Introduction: Severe gastro-esophageal reflux disease (GERD) is one of the important causative factors for development of pulmonary fibrosis (PF) and relative contraindication for lung transplantation due to high rate of graft failure. Currently, there is minimal literature regarding outcomes after Roux en Y gastric bypass (RYGB) in patients with PF and GERD. The aim of this study was to assess the perioperative outcomes, postoperative pulmonary functioning and GERD changes after (RYGB).

Methods: After IRB approval, patients with preoperative diagnosis of PF and GERD who underwent RYGB from 2006-2015 were retrospectively reviewed. Data collected included

demographics, baseline co-morbidities, perioperative data and postoperative outcomes. Pulmonary fibrosis was defined as clustered cystic air spaces between 3-10mm in diameter (honeycombing as defined by Fleischner Society) as per high resolution computed tomography (HRCT). Data was summarized as medians for continuous variables and as counts with percentages for categorical variables.

Results: A total of 12 patients with PF underwent laparoscopic (n=11) or open (n=1) RYGB. Ten (83.3%) patients were female; median age was 46.9 (IQR 41.1 -56.8) years and median BMI was 38.8 kg/m² (IQR 35.6 -46). Baseline co-morbidities included: GERD (n=9, 75%), hypertension (n=2, 16%), hyperlipidemia (n=4, 33.3%), obstructive sleep apnea (n=5, 42%), chronic obstructive pulmonary disease (COPD) (n=1, 8.3%), asthma (n=4, 33%), pulmonary embolus (n=2, 16.7%) and renal insufficiency (n=1, 8.3%). Median operative time was 143.0 minutes (IQR 134.5-184.0) and the length of stay 3.5 days. The 30-day major complications were reported in 4 patients with 1 major complication, leak required surgical intervention and prolonged hospitalization. There was no mortality. Pulmonary function test was performed for all patients preoperatively and the results were FVC 57% (IQR 48.50-73.50), FEV1/FVC 92% (IQR 70.34-110.5) and Diffusion capacity of lung for carbon monoxide (DLCO) (n=9) 54 (IQR 47- 63). At one year follow 4 patients were followed with PFT and values were FVC: 66% (IQR 54 - 75.25), FEV1/FVC : 107.50 (IQR 77- 113.25) and DLCO 66.5 (IQR 58.25- 74.5). Effects of RYGB procedure on patients with GERD symptoms were followed in 7 patients as subjective complete resolution (n=2), subjective improvement (n=4) and no changes (n=1) in one year follow up. One patient received lung transplant and developed pulmonary fibrosis in transplanted lung before RYGB procedure. Postoperatively, 3 patients were approved for lung transplant and one of these patients was removed from the list due to improved lung function after RYGB.

Conclusion: Roux-en- Y gastric bypass is relatively safe in patients with pulmonary fibrosis and GERD and results in subjective improvement in GERD symptoms. Effect on pulmonary function requires further analysis.

A5054

Documentation of Quality of Care Data for Roux en Y Gastric Bypass: Comparison of Synoptic and Narrative Operative Reports

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University of Manitoba¹

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Postoperatively, 3 patients were approved for lung transplant and one of these patients was removed from the list due to improved lung function after RYGB.

Conclusion: Roux-en- Y gastric bypass is relatively safe in patients with pulmonary fibrosis and GERD and results in subjective improvement in GERD symptoms. Effect on pulmonary function requires further analysis. Roux en Y gastric bypass, Pulmonary fibrosis, Gastroesophageal reflux, lung transplantation, Pulmonary Function

A5055

Fellow and Attending Surgeon Operative Notes are Deficient in Reporting Established Quality Indicators for Roux en Y Gastric Bypass

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Introduction: It is essential for surgeons to dictate the findings and important components of any invasive procedure in a comprehensive yet concise operative report. This documentation is the key format for communicating intra-operative events with health professionals and has far-reaching implications for providing additional healthcare and planning future operative procedures. Indeed, survey data indicate that bariatric surgeons feel the quality of bariatric surgical care may be impaired in the absence of such communication. Operative reports also have an important role in quality assurance, research, billing, and medical-legal conflicts. Evidence suggests that the quality of reports dictated by trainees and surgeons is poor despite its importance. This investigation analyzed and compared the quality of fellow and staff surgeon Roux-en-Y Gastric Bypass (RYGB) narrative dictations against nationally derived, validated, and reliable quality indicators (QIs) for this procedure.

Methods & Procedures: Twenty-one bariatric fellow reports and 21 attending RYGB narrative reports were selected at random and analyzed against checklist QIs that were established by a Canadian national Delphi process. These checklist QIs have been previously validated and have high inter-rater agreement at our institution.

Results: Fellows had a mean completion of 66.4% +/- 3.1% compared to 61.5% +/- 7.6% for attendings ($p < 0.0001$). Fellows statistically outperformed attendings on all subsections except patient, closure, and post-operative details. Attendings statistically outperformed fellows on closure details only (63.8 +/- 7.5 vs 50.5 +/- 12.0, $p = 0.002$, Table 1).

Conclusion: Bariatric surgery trainees statistically outperform their attending surgeons in completion rates for RYGB operative dictations. The clinical significance of this between the two groups is unknown. However, both groups are deficient in reporting at least one third of items deemed essential to a RYGB operative report by Canadian experts in bariatric surgery. This indicates a need for further education in RYGB operative dictation for both practicing surgeons and trainees. It also lends interest in exploring alternative forms of operative communication such as synoptic operative reporting in bariatric surgery.

A5056

Roux-en-Y Gastric Bypass versus Gastric Banding for Morbid Obesity A Case-Matched Study of 442 Patients, over a 10-year period

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A5057

Internal hernia after laparoscopic Roux en Y gastric bypass: correlation between radiographic and clinical findings and review of the literature

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Introduction: The risk of internal hernia (IH) after Laparoscopic Roux en Y Gastric Bypass (LRYGB) continues to plague bariatric surgeons and patients. We aim to study the sensitivity and specificity of clinical and radiologic examination compared to diagnostic laparoscopy.

Objective: Gastric banding (GB) and Roux-en-Y gastric bypass (RYGBP) are used in the treatment of morbidly obese patients. We hypothesized that RYGBP provides superior results.

Methods: We have made a matched-pair study in patients with a body mass index (BMI) less than 50 in a university hospital and regional community hospital. Four hundred forty-two patients were matched according to sex, age, and BMI being similar between groups.

Results: After matching there were 221 patients for each technique with similar groups according to sex, age and BMI. The mean age was 38.5 in GB group and 38.7 in RYGBP. There was a majority of female (f/m 7:1). Mean BMI at 0, 5 and 10 years for GB was 43, 32 and 32.5 respectively. For RYGBP it was 43, 29.3, 29.9, respectively. Follow-up was 84% at the end of the study period (10 years postoperatively). Weight loss was quicker, maximal excess body mass index lost (EBMIL) was greater (57.5% vs 71.7%, $p = 0.009$), and weight loss remained significantly better after RYGBP until the tenth postoperative year. 50.2% in GB group had lap band removal. At 10 years, there were more failures (BMI > 35 or reversal of the procedure/conversion) after GB (74.7% vs 34.3%, $p < 0.001$). There were more long-term complications (60.2% vs 21.3%, $p < 0.001$) and more reoperations (58.8% vs 17.2%, $p < 0.001$) after GB. Comorbidities improved more after RYGBP.

Conclusion: In this 10-year period Roux-en-Y gastric bypass is associated with better weight loss, resulting in a better long term effect and with less morbidity and mortality comparing gastric banding.

Methods: This is a consecutive series of all patients who underwent diagnostic laparoscopy for possible IH after LRYGB from 2009 to 2016.

Results: We performed 574 LRYGB cases and 27 diagnostic laparoscopies for possible IH. The mean age patients was 35.7 (range 24-50 years), 59.2% were females, mean excess at the time of presentation was 61.9% range (15-120%) and the duration of symptoms was less than one month in 81.5%. Presentation was urgent in 77.8% and with abdominal pain in all patients, vomiting in 40.7% of patients. Even when CT Abdomen was negative 3/5 (40%) patient had internal hernia with incarcerated small bowel. Intra-operatively, 20/27 (74%) patients had IH (0.35% in our patients). Despite, 55.6% of IH having incarcerated small bowel, only one patient needed small bowel resection. In the, both spaces were open in 9 patients (45%). Petersen space IH in 18/20 (90%), jejunojejunostomy in (14/20) 70% and we encountered no patients with mesocolic IH (88.9%

were antecolic LRYGB). No conversion or mortality. Eighteen percent of patient continued to have pain and 4 patients (14.8%) were lost for follow up.

Conclusion: IH needs a high index of suspicion, an aggressive strategy with early laparoscopy for patients with negative studies is safe and effective.

A5058

Longitudinal Assessment of Safety and Efficacy of Gastric Bypass in Obese Patients at Extreme Ages in Two Different Institutions.

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Background: Obesity in adolescents and elderly subjects has been increasing in the last decades. Bariatric surgery is indicated in patients with clinically severe obesity. Although a strict age limit has not been established, results at the extremes of age are scarce. The aim of the study was to comparatively analyze safety and efficacy of RYGB in 3 groups of patients: adolescents, adults, and elderly patients.

Patients and Methods: A retrospective analysis of all patients who underwent a RYGB between 1992 and 2014 and completed a minimum follow-up of 6 months in the 2 participant institutions was carried out. Patients were divided in 3 groups according to their age: adolescent (≤ 20 years), adults (21 and 59 years) and elderly patients (≥ 60 years). Weight loss, complications and resolution of comorbid conditions were assessed at 6 and 12 months after surgery. Descriptive and inferential statistics were utilized for group comparison. Microsoft Excel[®] and IBM SPSS Statistics version 21.0 were used for statistical analysis. Any p value ≤ 0.05 was considered as statistically significant for a two-tailed hypothesis.

Results: A total of 1021 patients were included in the study. 31 (3%) were adolescents, 903 (88.4%) adults, and 87 (8.5%) elderly. Mean \pm SD BMI before surgery was 45.4 \pm 8.03 kg/m². Gender distribution was similar in all groups. More than 74% of the included patients completed 1-year follow-up. Older

subjects demonstrated a significantly higher prevalence of preoperative comorbidities, such as type 2 diabetes (T2D) and high blood pressure ($p < 0.0001$). Length of stay, hospital readmission, transfer to ICU, and early complications were similar among all groups. %EBWL at 6 and 12 months was significantly less in elderly than adult patients (48 vs. 54% and 61 vs. 67% respectively; $p = 0.008$). BMI at 12 months was similar in all 3 groups. %EBWL, WL and BMI showed similar trends between adolescent and adult patients. T2D remission was 62.1% in adolescents, 32.5% in adults and 42.5% in elderly patients at 12 months. Remission rate of hypertension, sleep apnea and dyslipidemia was high and similar in all groups ($p \leq 0.05$).

Conclusions: According to our results, elderly patients demonstrated lesser WL compared with adults and adolescents. Elderly patients showed a higher frequency of comorbidities and also a higher remission rate of all comorbid conditions. Adolescents showed similar WL than adults and high remission rate of comorbidities. Weight loss and remission of comorbid conditions were independent of gender and initial BMI in all groups. Despite these differences, the safety and efficacy of RYGB was evident in all groups.

A5059

Multimodal Postoperative Pain Control is Effective and Reduces Narcotic Use after Laparoscopic Roux-en-Y Gastric Bypass (LRYGB)

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Background: Narcotics have been the mainstay of postoperative pain control for more than 50 years. While narcotics provide effective pain control, their use is associated with nausea, respiratory depression, and ileus and has been implicated in the epidemic of prescription drug dependency in the United States. Narcotic use following Laparoscopic Roux-en-Y Gastric bypass (LRYGB) is particularly problematic because of the prevalence of obstructive sleep apnea in the morbidly obese population. The aim of our study was to determine if an evidence-based, multimodal pain regimen during hospitalization could decrease the total oral morphine equivalent use after LRYGB. Our secondary

aims were to compare both Likert pain scores in patients before and after this intervention and hospital length of stay (LOS).

Methods: This is a single institution retrospective study of patients undergoing LRYGB in our hospital between January 2007 and July 2015. In April 2013, we initiated the following multimodal pain regimen for patients undergoing bariatric surgery at Geisinger Medical Center.

- Day of surgery
- Oral 400 mg of Celecoxib and 975 mg of Acetaminophen pre-operatively
- Narcotic patient controlled analgesia (PCA) post-operatively
- Postoperative day (POD) #1
- 400 mg of Celecoxib
- Discontinue narcotic PCA
- POD #1-3
- 975 mg of Acetaminophen scheduled every eight hours
- 650 mg of Acetaminophen for breakthrough pain (not to exceed 4000 mg Acetaminophen per day).

- Oral oxycodone as needed for breakthrough pain

We excluded all patients with a glomerular filtration rate <60 from this study because Celecoxib was contraindicated. A total of 1439 patients who underwent Laparoscopic Roux-en-Y Gastric Bypass during the study period were included: 1182 patients pre-intervention (Narc) and 257 post intervention (Multi). We calculated the total amount of narcotics used and converted this to an oral morphine equivalent value for each patient as well as mean and maximum 10-point Likert pain scores. We also analyzed the LOS and complication rate for each group. Univariate analysis was used to compare baseline characteristics between the Narc and Multi groups using the chi-square test for categorical variables and the 2 sample t-test for continuous variables.

Results: The groups were similar with no significant differences in age, gender, body mass index (BMI) or Charlson co-morbidity scores. The Multi group had significantly lower median oral morphine equivalent requirements as well as minimum and maximum interquartile range for narcotic use. The Multi group also had a significantly lower maximum Likert pain score, although mean Likert pain scores were significantly higher than the Narc group. The Multi group had a significantly shorter length of stay. Minor complications were more common in the Multi group while major complications were more common in the Narc group. (Table 1)

Conclusion: The implementation of an evidence-based, multimodal pain regimen after LRYGB was associated with a significant decrease in narcotic

requirements as well as maximum postoperative pain scores - both mean and interquartile ranges. Patients utilizing this regimen also had a significantly shorter LOS. The mean Likert pain scores were higher in this group which may have been a reflection of the overall decreased use of narcotics. The impact on post-operative complications needs to be analyzed in more detail to determine the influence of this protocol. Our study provides strong evidence that multimodal regimens are effective in controlling post-operative pain in patients undergoing LRYGB. Maximum pain scores were reduced while mean scores were higher but acceptable. The widespread implementation of such regimens has the potential to enhance recovery in patients undergoing LRYGB. Understanding the efficacy of such regimens is particularly important as the Food and Drug Administration (FDA) prioritizes efforts to decrease narcotic dependency in the United States. "

A5060

Long Term Incidence of Internal Hernias with Retrocolic Roux Limbs

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Background: Reports of 3-6% rates of internal hernia through the transverse mesocolon defect after Roux-en-Y gastric bypass have led many surgeons to abandon the retrocolic approach in favor of the antecolic approach. This remains controversial as Peterson defect hernias are more prevalent after antecolic constructions. At our center, the predominant method has remained retrocolic with particular attention to an interrupted suture technique to maintain stability of the bowel at the mesocolon during normal bowel motility. We hypothesized that this technique results in an internal hernia rate significantly lower than earlier reports without increasing other complications requiring reoperation.

Methods: We performed a retrospective review of a prospectively collected database and reviewed the charts of all patients who had gastric bypass at any of our associated hospitals from April 1999 to February 2010. The mesenteric defect at the jejunojejunostomy was routinely sutured closed. The retrocolic Roux limb was routinely sutured to the

transverse mesocolon with three interrupted sutures placed at the same level along the longitudinal axis of the bowel. The Peterson defect was closed with a single purse-string suture. Data were collected from electronic health record sources within our multi-hospital system and multi-specialty outpatient clinics. This included demographics, comorbidities, operative data, complications, preoperative, lowest, and most recent patient weight, readmissions, and reoperations between the time of index surgery and most recent patient contact. The primary outcomes of interest were development of internal hernia at the transverse mesocolon and other complications at the level of the transverse mesocolon (e.g., strictures). We analyzed data using descriptive statistics, t tests, and chi-squared tests in Stata SE.

Results: There were a total of 827 patients whose gastric bypass was performed in a retrocolic fashion. There were 26 patients who had antecolic Roux limbs. The table shows the demographic variables for patients in both of these groups. There were no significant differences. The median time of follow-up for all patients was 6.54 years (range 2 weeks to 17 years). Surgery duration for retrocolic Roux limbs averaged 131 minutes (SD 53) with 193 ml (SD 114) of estimated blood loss. Sixteen retrocolic patients developed an internal hernia at the transverse mesocolon (cumulative incidence 1.93%). The most common mode of failure noted at reoperation was disruption of the suture(s) between the Roux limb and the transverse mesocolon. Seven patients (0.85%) in the retrocolic group had another problem at the transverse mesocolon (stricture or adhesion) that required reoperation. Combining these with the number of patients who developed internal hernias at the transverse mesocolon, the cumulative incidence of complications associated with the retrocolic technique was 2.78%. One patient (0.12%) developed an internal hernia at Peterson's space. There were no hernias through the jejunojejunostomy mesenteric defect. Seven of the 16 patients with internal hernias at the transverse mesocolon developed them within the first year. The annual incidence of internal hernia varied over time peaking in the first year at 0.92 percent and then rapidly decreasing to a rate between zero and 0.41% percent over years 2 through 11 (see figure). The cumulative incidence of readmission was 16.20%, and the proportion of patients who needed reoperation for any reason was 12.94%. The 26 patients with antecolic Roux limbs were similar to those with retrocolic Roux limbs. The operative

duration (118 mins, $p=0.87$) and blood loss (191 mL, $p=0.56$) for the antecolic approach were similar to those for the retrocolic approach. One of the patients in the antecolic group developed an internal hernia at Peterson's space (3.85%, $p=0.53$ compared to the RC group). The reoperation rate for this group was similar to those in the retrocolic group (15.38%, $p=0.72$ compared to RC). The readmission rate was slightly higher with the antecolic approach than the retrocolic approach (30.77% compared to 16.20%; $p=0.05$). **Conclusions:** After a retrocolic gastric bypass using our described technique, obstruction of the Roux limb due to either internal hernia or stricture at the mesocolon defect can occur up to 10 years after surgery. The incidence of internal hernia after our retrocolic technique appears to be low, peaking at 0.92% in the first year after surgery and then decreasing to low but non-zero levels for at least 10 years after surgery. Contrary to conventional wisdom, the typical mode of failure in patients who had this problem was disengagement of sutures rather than fat loss in the mesentery. In addition, with closure of the mesenteric defect at the jejunojejunostomy the rate of internal hernia at that location was negligible. These data suggest that the retrocolic approach is safe and is not associated with higher complication rates than the antecolic approach.

A5061

Radiographic Improvement of Hepatic Steatosis and Clinical Improvement of Type II Diabetes Mellitus after Laparoscopic Roux-en-Y Gastric Bypass

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Background: Due to increasing rates of obesity in developed countries, nonalcoholic fatty liver disease (NAFLD) is now the most common form of liver disease and the leading cause of cirrhosis in those regions. Along with obesity, the prevalence of type II diabetes mellitus (T2DM) is steadily increasing worldwide with the adoption of the highly processed Western diet. There is a known but not definitely causal association between insulin resistance and the development of hepatic steatosis. In addition, both hepatic steatosis and insulin resistance have been seen to improve with the loss of as little as 5-

10% of total body weight. However, complete cure of T2DM is not always achieved after weight loss surgery. We sought to compare post-bariatric-surgical improvement of hepatic steatosis to determine if it improves concomitantly with the improvement of insulin resistance or if the two are not directly related. Prior publications have demonstrated improvement of liver histopathology as well as sonographic decrease in liver volume after significant weight loss. Our group has also published data on the ability of computed tomography (CT) to show improvement and sometimes resolution of the findings of NAFLD after weight loss surgery (WLS). The CT findings of steatosis include low attenuation of liver parenchyma and hepatomegaly. We undertook to examine the relationship between WLS, clinical improvement of T2DM, and radiographic improvement of NAFLD.

Methods: After IRB approval, a retrospective review was performed of all patients (986) who underwent primary laparoscopic gastric bypass (LGBP) at a university hospital from July 2006 through January 2014. These operations were performed with a totally linear stapled technique as we have previously described. We then identified any patients who had undergone either a preoperative CT scan of the abdomen/pelvis, or an early postoperative scan (prior to significant weight loss) as well as an interval CT scan of the abdomen/pelvis performed at more than 60 days after surgery for any indication. The radiologists' interpretations of the perioperative scans were reviewed and all descriptions of steatosis, fatty infiltration, fatty liver, fatty changes, or hypodense liver were documented. Later scans were searched for similar criteria as well as evidence of improvement. Among this subset of patients with at least 2 such scans, we also searched the electronic health record for a diagnosis of T2DM, use of hypoglycemic agents, and level of hemoglobin A1C (HbA1c) at the same time intervals.

Results: 19 patients (1.93%) were identified as having perioperative CT-documented evidence of NAFLD, as well as a subsequent scan at an interval of 60 days or more. 89.5% of these were female, the mean age was 41.5 years, and median body mass index (BMI) at the time of surgery was 46.9 kg/m². 16 of these patients (84.2%) showed radiographic improvement of their NAFLD from the perioperative to the postoperative scan. The median time period from initial to postoperative CT was 826 days, and the median BMI at the time of second scanning was 30.5 kg/m². The 3 patients who did not demonstrate radiographic improvement of liver appearance still

experienced significant weight loss (average BMI points lost = 19.3 kg/m²). Among these, 2 had a preoperative diagnosis of T2DM and saw complete remission, with postsurgical HbA1c's of 5 and 4.9 and an ability to discontinue all hypoglycemic agents. The third patient with no radiographic improvement did not have a history of T2DM and did have a substantial postsurgical weight loss to a BMI of 27.7. Nine of 19 study patients (47.3%) were diagnosed preoperatively with T2DM, and 3 more had a history of gestational diabetes/insulin resistance (63.1% insulin resistant total). All of these patients experienced significant weight loss after surgery. In addition, 10 of these 12 previously insulin resistant patients (83.3%) experienced remission of T2DM/insulin resistance, with normalization of HbA1c and ability to discontinue prior hypoglycemic medications. Of the remaining 2, 1 patient was able to discontinue insulin but an oral hypoglycemic was still needed and HbA1c did not normalize. The 2nd experienced worsening T2DM, with a rise of HbA1c from 7.1 to 8.2 despite the addition of insulin to an oral hypoglycemic regimen. There were 9 study patients (47.3%) not diagnosed with insulin resistance or T2DM prior to surgery. All of these patients lost significant weight and remained free of insulin resistance or T2DM post-surgery. However, 1 of these patients experienced no radiologic improvement in hepatic steatosis.

Conclusions: Although the functional status of the liver was not examined in this study, the radiographic improvement of NAFLD in this series in 84% of patients was salutary. Similarly, the improvement in insulin resistance for most patients was also dramatic, although not universal. Obesity, NAFLD and T2DM are clearly interrelated but improvement of one of these components does not guarantee improvement of the others. Patients should be prepared for different measures of 'success' after bariatric procedures, and no guarantee of resolution of all comorbid conditions.

A5062

Bilopancreatic diversion with duodenal switch achieves better 5 year weight outcomes over Roux-en-Y gastric bypass when body mass index is 50kg/m² or over.

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Weight loss control in patients with superobesity (body mass index/BMI \geq 50 kg/m²) still represents a challenge for today's bariatric surgery armamentarium. The literature has shown a higher frequency of weight regain among these patients, especially after predominantly restrictive procedures such as sleeve gastrectomy and Roux-en-Y gastric bypass (RYGB). We compared the 5 year-weight loss outcomes of a retrospective series of BMI \geq 50 kg/m²; patients after RYGB and biliopancreatic diversion with duodenal switch (BPD-DS). 111 consecutive RYGB and 125 BPD-DS patients were treated at a single center by 2 surgeons, either procedure being performed according to the surgeon's preference. The percentage of excess weight loss (%EWL), nadir of weight loss, weight regain as well as the % of patients regaining weight were compared between the 2 procedures. Univariate as well as multivariate analyses included patients' characteristics (age, gender, co-morbidities). The 2 groups of patients were comparable in terms of initial characteristics. From 6 months postoperatively the %EWL became significantly different between the 2 procedures. Weight loss at the nadir was significantly more important after BPD-DS with a loss of 72.7 \pm 17.7 kg (48.0 \pm 8.8% total weight lost/%TWL) compared to 55.2 \pm 15.2 kg after RYGB (38.0 \pm 9.9 %TWL) ($p < 0.0001$). 5 years after the surgery, the %EWL was 84.1 \pm 22.5 % after BPD-DS compared to 59.1 \pm 18.5 % after RYGB ($p < 0.0001$). Overall there was a significantly higher weight regain after RYGB (9.6 \pm 8.7 kg) compared to BPD-DS (5.7 \pm 7.2 kg) with $p = 0.0069$ and RYGB patients regained weight significantly more frequently: 89% vs 62% of the BPD-DS ($p = 0.0001$). Compared to the nadir of weight loss, 5 years after surgery patients who had a BPD-DS had a similar %TWL of 46.4 \pm 9.4 % compared to RYGB patients who had a 33.5 \pm 10.0 %TWL. After the multivariate analysis BPD-DS appeared as an independent factor for weight loss at the nadir and at 5 years as well as for a reduced risk of weight regain. Patients whose BMI is 50 or over may benefit of better and more sustained weight outcomes within 5 years of the surgery.

A5063

Decreased incidence of post-operative bleeding through adjustment of pre-operative pharmacologic VTE prophylaxis

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Background: Data review uncovered higher than expected number of laparoscopic Roux - en Y gastric bypass and sleeve gastrectomy patients requiring postoperative blood transfusion due to post-operative bleeding. Pharmacologic venous thromboembolic (VTE) prophylaxis had been provided to these patients. Pharmacologic VTE prophylaxis was adjusted to decrease transfusion rate.

Objectives: Decrease incidence of postoperative bleeding resulting in blood transfusion.

Setting: Two surgeons in a single site community hospital performing bariatric surgery under the credentials of Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP)

Methods: Measured incidence of post-operative blood transfusions and VTE using MBSAQIP patients' data with documented blood transfusion and/or VTE; and reviewed hospital medical records to verify administration of preoperative PVTEP.

Results: For our laparoscopic Roux - en Y gastric bypass and laparoscopic sleeve gastrectomy surgical patients, from July 7, 2012 to July 6 2014, out of 529 patients receiving pre-operative enoxaparin 40 mg subcutaneously, 28 patients (5.3%) received blood transfusion due to post-op bleeding; 1 patient (0.2%) in this group was positive for VTE events. For the patient population from July 7, 2014 to November 9, 2014, 117 consecutive patients received no preoperative anticoagulant, no patients required a blood transfusion due to post-operative bleeding; 1 patient with a pre-op Hemoglobin of 8.1 was transfused for chronic anemia; no VTE events occurred for this group. From Nov. 11, 2014 to April 1 2016, 525 patients received pre-operative heparin 5000 units subcutaneously with no patients requiring post-operative blood transfusion and 1 patient positive for a VTE event (0.2%).

Conclusion: VTE prevention is an important factor in positive patient outcomes after bariatric surgery. In our patient results, prophylactic heparin and enoxaparin provided equivalent VTE prevention; preoperative heparin administration demonstrated improved post-operative bleeding resulting in zero blood transfusions compared to preoperative enoxaparin.

A5064

Laparoscopic Sleeve Gastrectomy in Patients with Abdominoplasty: A Case-Control Study

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Background: Abdominoplasty is increasingly performed after weight loss surgery. However, performing a LSG after abdominoplasty poses technical challenges.

Objective: The current study aimed to compare operative events and postoperative outcomes between laparoscopic sleeve gastrectomy (LSG) patients with and without a history of prior abdominoplasty.

Methods: A case-control study was conducted on 2 groups of patients with (n=33) and without (n=69) prior abdominoplasty who were undergoing LSG. Patient demographics, baseline characteristics, as well as operative and postoperative events were compared between the 2 groups.

Results: A total of 102 patients with an average age of 39.55±7.73 years and body mass index (BMI) of 42.8±5.86 Kg/m² were included. There were no significant differences between the 2 groups in terms of demographics and preoperative BMI. The number of ports required was significantly higher in the LSG patients with a history of prior abdominoplasty than in the non-abdominoplasty patients. The operation time was also significantly longer in the abdominoplasty patients than in the non-abdominoplasty patients (90.3±36.7 minutes vs. 57.08±17.7 minutes, p<0.0001). However, no significant differences were observed in terms of postoperative complications, length of hospital stay, and weight loss results.

Conclusions: Even with the anatomic alterations that can occur due to an abdominoplasty, LSG can be feasibly and safely performed in this patient population, with comparable outcomes to patients without a prior abdominoplasty. Operative strategies should be considered to overcome the technical challenges during LSG in patients who underwent a prior abdominoplasty.

A5065

Roux-en-Y gastric bypass as an alternative to fundoplication in the management of the morbidly obese patient referred for symptomatic paraesophageal hernia

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Introduction: Morbidly obese patients with hernias are at increased risk of recurrence after repair than normal weight patients. The recurrence rates for paraesophageal hernias are quite variable and have been reported to be as high as 25%. Crural tension and length of intra-abdominal esophagus at the completion of the dissection are thought to play a major role in recurrence rates. High intra-abdominal pressures also have a role in recurrence rates. Weight loss results in decreased intra-abdominal pressures. Roux-en-Y gastric bypass results in diversion of gastric and biliary secretions from the esophagus which may decrease symptoms regardless of the competence of the lower esophageal sphincter. In our practice, when patients are referred for paraesophageal hernia and have a BMI greater than 35, they are educated about weight loss surgery and their insurance is queried to see if they have coverage. If they are amenable, Roux-en-Y gastric bypass rather than fundoplication is our preferred surgical operation combined with reduction of the hernia and crural repair.

Methods: A retrospective chart review of patients referred for paraesophageal hernias with a BMI of greater than 35 over the past 24 months. All patients were offered Roux-en-Y gastric bypass. Their charts were reviewed to assess which patients refused treatment and sought a second opinion, which patients proceeded with concomitant RYGB, which patients had a hernia repair without fundoplication, and which patients had a fundoplication as part of their procedure.

Results: One patient had an open paraesophageal hernia repaired without fundoplication or weight loss surgery by a surgeon that offered him a second opinion. He currently is symptom free 6 months after surgery. One patient had a laparoscopic reduction of paraesophageal hernia without fundoplication or RYGB and is symptom free but on a proton pump inhibitor. Three patients had fundoplication combined with crural repair, are an average of 2.3 months after surgery without symptoms. Four patients had RYGB combined with crural repair, are an average of 4 months out from surgery, and are asymptomatic.

Discussion: Based on our short-term results, RYGB appears to be an excellent option as part of hernia repair resulting in no reflux symptoms. Long-term

comparisons need to be done to assess if it provides more effective long term symptom resolution, in addition to the known benefits of weight loss and other comorbid condition resolution or improvement.

A5067

Prevalence of Abnormal Laboratory Values Before and After Bariatric Surgery

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Background: Bariatric surgery is known as a safe, effective and enduring treatment for obesity. Evaluating patients prior and following bariatric surgery is an important process. However, the prevalence of abnormal markers in the preoperative bariatric population is not well known. Moreover, additional investigation of the efficacy of current postoperative monitoring standards is needed. This study presents a comprehensive review of the prevalence of abnormal laboratory markers before and after bariatric surgery as a means of evaluating standard care.

Methods: 2,170 patients undergoing laparoscopic Roux-en-Y gastric bypass (LRYGB), laparoscopic sleeve gastrectomy (LSG), or laparoscopic adjustable gastric banding (LAGB) at a single institution were included in this retrospective study. Bariatric labs were collected preoperatively and at 12 months after surgery. These included lipid profile, hematology, liver function, vitamins, hormones, electrolytes, iron indices, diabetic status, and biochemical cardiac risk factors. Standard laboratory reference ranges were noted for each marker. Mean laboratory values and prevalence of abnormal markers were calculated pre- and postoperatively. Continuous and dichotomous variables were analyzed using paired-t and Chi-square tests, respectively, using GraphPad Prism v6.01. P<.05 was considered statistically significant.

Results: All diabetic status and lipid profile markers significantly improved at 12 months after bariatric surgery. Prevalence of abnormal lab values from preop to one year was as follows: hemoglobin A1c (28.2% to 8.3%), glucose (52.0% to 23.2%), insulin (34.8% to 2.2%), total cholesterol (29.9% to 17.1%), triglycerides (36.2% to 10.9%), LDL (26.1% to 12.3%), HDL (34.9% to 13.9%), TG/HDL ratio (36.9% to 8.8%)

(all p<.0001). C-reactive protein saw a notable reduction in abnormal status (78.9% to 25.8%). Liver function tests AST (11.5% to 4.8%) and ALT (12.2% to 4.1%) also improved; however, total bilirubin showed a slight increase in abnormal status at 12 months (2.4% to 5.3%). Significant improvement in abnormal status was seen in total iron (41.7% to 23.9%) and transferrin saturation (54.2% to 35.6%), while total-iron binding capacity became more abnormal at one year follow-up (5.6% to 12.0%). Vitamin B12 became significantly more abnormal (5.8% to 21.8%), while serum folate saw a reduction in abnormal status (37.5% to 27.6%). Finally, abnormal creatinine significantly improved from 6.7% preoperatively to 3.9% at 12 months. Markers that saw no significant differences in abnormal status included ferritin (27.0% to 28.3%), transferrin (30.3% to 28.5%), platelets (6.7% to 6.8%), total calcium (3.8% to 3.1%), thyroid-stimulating hormone (9.1% to 11.5%), whole blood thiamine (32.6% to 38.4%), lipoprotein(a) (27.0% to 23.4%), homocysteine (9.4% to 7.3%), BNP (2.0% to 8.2%), NT-proBNP (5.2% to 7.6%), and alkaline phosphatase (8.1% to 6.2%) (all p>.05).

Conclusion: Multiple laboratory markers showed high prevalence of abnormal status among the bariatric population prior to surgery. In particular, CRP, diabetic status, and lipid profile markers began with high abnormal status that was strikingly reduced at one year postop. Yet many laboratory markers saw no change at one year after surgery and warrant further investigation of their utility in postoperative standard care for bariatric patients.

A5068

Comparison of 10-Year Atherosclerotic Cardiovascular Disease Risk Score Reduction Following Roux-en-Y Gastric Bypass Surgery and Sleeve Gastrectomy

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Background: This study was designed to determine if bariatric surgery results in a significant reduction in 10-year atherosclerotic cardiovascular disease (ASCVD) score. The study also sought to compare ASCVD risk score changes between laparoscopic vertical sleeve gastrectomy (LVSG) and Roux-en-Y gastric bypass (RYGB) surgery.

Methods: This was a retrospective cohort study that was performed by electronic medical record and paper chart review. Patients were included if they had sufficient data in their chart to calculate an ASCVD score before surgery and 3-12 months post-surgery. Data collected included all components used to determine the ASCVD risk score: age, gender, race, systolic blood pressure, total cholesterol, high density lipoprotein cholesterol, diagnosis of diabetes mellitus, treatment of hypertension, and smoking status. Data were analyzed using the Wilcoxon signed-rank test.

Results: A total of 85 patients were included in the study. The population included 58% LVSG and 42% RYGB patients. Bariatric surgery produced a significant 37.5% relative reduction in ASCVD risk score (before 11.5 +- 7.4 vs after 7.2 +- 6.1, $P < 0.0001$). LVSG led to a relative 32.6% reduction in ASCVD risk score (before 12.2 +- 7.6 vs after 8.2 +- 6.4, $P < 0.0001$) and RYGB produced a relative 45.1% reduction in ASCVD risk score (before 10.6 +- 6.9 vs after 5.8 +- 5.3, $P < 0.0001$). There was no significant difference in ASCVD risk score reduction demonstrated between the two surgical procedures.

Conclusions: These results show that bariatric surgery produces a significant reduction in atherosclerotic disease risk. As both LVSG and RYGB allow for similar benefits in weight reduction and metabolic alterations, this study shows each type of surgery allows for a similar benefit in ASCVD Risk Score reduction.

A5069

Comparative analysis of the Single Anastomosis Duodenal Switch 300cm common channel to established bariatric procedures: an assessment of one year postoperative data illustrating weight loss, risk profile, and nutritional status

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Background: A modification of the duodenal switch (MDS) utilizing a single anastomosis with 300cm common channel has been gaining popularity since first described by Dr. Torres in 2007. This procedure has gone by many names, including the single anastomosis duodenal-ileal bypass with sleeve gastrectomy (SADI) and most recently, the Stomach, Intestinal, and Pylorus Sparing procedure (SIPS). However, there are very few studies illustrating definitive results of these procedures.

Methods: Utilizing our internal practice database and electronic medical records, clinical data was obtained for our set of 150 MDS patients who underwent a primary procedure at Centers of Excellence between July 2014 and July 2015. These results were compared with established data found in the literature discussing outcomes of the laparoscopic sleeve gastrectomy (SG), laparoscopic roux-en-y gastric bypass (RYGBP), and laparoscopic traditional duodenal switch (DS) procedures. The main outcomes evaluated at one year included excess weight loss; 30 day, 6 month, and 1 year readmission and reoperation rates; resolution of comorbidities; as well as postoperative metabolic and nutritional status.

Results: We analyzed 150 patients who underwent a primary laparoscopic MDS procedure and compared them to similar patients who underwent a laparoscopic sleeve gastrectomy (SG), laparoscopic roux-en-y gastric bypass (RYGBP), or laparoscopic duodenal switch (DS). The EWL in MDS patients at one year is similar to DS and greater than SG or RYGBP, while the risk profile, although slightly more than SG, is less than that of RYGBP or DS. The resolution of comorbidities is comparable across procedures as a function of weight loss, yet when focused specifically on diabetes, the MDS appears to show a greater percent resolution than RYGBP and is comparable with DS. At one year there have been no appreciable metabolic or nutritional deficiencies as compared to SG or RYGBP and when compared to DS, the metabolic and nutrition profile (specifically fat soluble vitamins A, D, E, and K) is superior at one year.

Conclusion: The use of laparoscopic malabsorptive procedures has been increasing on a national level. Compared with our other bariatric procedures, specifically the RYGBP and DS, the Modified Duodenal Switch is associated with a lower risk profile, an equivalent or improved nutritional status, and increased weight loss. Further studies will help to definitively define the role of this promising new procedure and how it plays within our bariatric armamentarium.

A5070

The Development of Patient Reported Outcomes for National Implementation in the MBSAQIP -- The First Report from the PCORI funded LOBSTER PROMs Study

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Background: The Patient Centered Outcomes Research Institute (PCORI) recently funded a 4 year project to determine the comparative effectiveness of metabolic and bariatric surgical procedures using patient reported outcomes. The LOBSTER PROMs study (Long-term Outcomes of Bariatric Surgical Techniques and their Effect on Related Patient Reported Outcome Measures) will first determine which outcomes are most important to patients who have had metabolic and bariatric surgery and to identify corresponding validated patient-reported outcome measures to measure preoperatively and at 1 year after surgery. The collection of these PROMs will go live nationally in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) in January 2017. Currently, the MBSAQIP gathers data on more than 90% of all metabolic and bariatric surgery procedures nationally. Those data include demographics, comorbidities, surgical details, postoperative complications and outcomes such as reduction in weight and weight related diseases. To date, no patient-reported data are collected in the MBSAQIP. Through multiple focus groups and alpha and beta pilots, our team will determine which outcomes are most important to metabolic and bariatric surgery patients both preoperatively and postoperatively. Additionally, we will engage patient family members as well as health caregivers to share the outcomes they perceive to be the most important to patients.

Methods: Focus Groups Preoperative and postoperative patients, family and close friends, and health caregivers (metabolic and bariatric surgeons, obesity medicine specialists, psychologists, nurses, and dieticians) are being invited to participate in a series of focus groups. Focus group discussions will ascertain which outcomes are most important to patient health-related quality of life and satisfaction 1 year after metabolic and bariatric surgery. Important domains that will be explored are health, mobility, activities of daily living, work/school, relationships with food, social/interpersonal life, sexual life, and emotional health/self-esteem. Immersion crystallization methods will be used to synthesize the shared experiences of the focus group participants and determine the most important outcomes. Previously validated obesity-specific and general health PROMs will be reviewed for relevance with the key outcomes identified during the focus

groups. A selection of measures will then be presented to the focus groups consisting of patients, family members and caregivers to establish which instruments meet the following criteria: the ability to measure the most important outcomes identified, the clarity of the instructions and questions, and minimization of question burden on the patient. IT Platform An electronic information technology platform will be decided upon for PROMs administration. The platform will be HIPAA compliant, be electronic health record agnostic, have a patient-friendly user interface, and be able to rapidly scale to the national level. Alpha Pilot The selected PROMs will be implemented into bariatric surgical practices of 5 hospitals. The surveys will be administered to all preoperative patients and all patients who are 1 year post-metabolic and bariatric surgery. The PROMs, the IT interface and the data collection protocol will be modified to maximize information collected and patient responsiveness, while minimizing data burden. Beta Pilot The beta pilot will include up to 20 centers across the country including large academic medical centers as well as small community centers and private practices, to trouble shoot feasibility for national implementation.

Results: At the time of the 2016 Obesity Week meeting, we will present all of the work to date. We will provide clinicians participating in the MBSAQIP information about what our focus groups indicate are the most important outcomes, which PROMs will be assessed for their patients starting in January 2017, the electronic platform to be used for PROM collection, and the results from our pilot projects.

Conclusions: This initiative will create the first comprehensive collection of patient-reported data in metabolic and bariatric patients in the United States. The addition of PROMs to the MBSAQIP will create the largest national health registry collecting patient-reported outcomes in the United States with data from 14,000 new patients collected every month. Patient-reported data will allow clinicians to measure changes from pre- to postop and perform comparative effectiveness analyses which include heterogeneity of treatment effect for different subcategories of patients in order to determine the right operation for the right patient.

A5071

A Unique Case of Repair of a Gastro-hepatic Fistula After Laparoscopic Sleeve Gastrectomy with Endoscopic Stent Placement

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Introduction: Over the last 15 years, laparoscopic sleeve gastrectomy (LSG) has risen in prevalence as a stand-alone surgical option for treating obesity. Although it has been established as a safe procedure, one of the most worrisome complications is development of a leak at the gastrectomy staple line, which occurs in 1 to 3% of patients. A variety of leak management options have been investigated, including reoperation, laparoscopic or percutaneous drainage, the use of parenteral nutrition, and endoscopic stenting. The objective of this report is to present a unique case of a gastro-hepatic fistula following LSG that was treated with endoscopic stenting, and to describe our single-institution experience of managing sleeve leaks with endoscopic stents.

Case Presentation: M.M. is a 57-year-old male (BMI = 55.5 kg/m²) with a medical history significant for deep venous thrombosis requiring daily Coumadin therapy, chronic inflammatory demyelinating polyneuropathy necessitating weekly intravenous immunoglobulin infusions via a mediport, and multifocal acquired demyelinating sensory and motor neuropathy, managed with daily prednisone. Following the appropriate preoperative education and evaluation, he was cleared for weight reduction surgery and elected to undergo LSG. The patient underwent an uncomplicated LSG and was discharged on post-operative day three on a lovenox bridge of 150mg subcutaneous twice daily and 5mg oral Coumadin daily. He returned two weeks later with anemia and sepsis. Imaging revealed a large sub-capsular liver hematoma (Figure 1). Additionally, he was diagnosed with bacteremia requiring removal of the mediport and administration of intravenous (IV) antibiotics. Once stabilized, he was bridged with IV heparin and was discharged with a therapeutic INR on Coumadin. He was readmitted six weeks post-operatively with coffee-ground emesis. Imaging demonstrated infection of his subcapsular hematoma, and an image-guided drain was placed. He resumed normal oral intake, but two days after drain placement, he noted oral contents in the drainage bag. A subsequent upper gastrointestinal study (UGIS) demonstrated a leak from the sleeve into the subcapsular hepatic hematoma, distal to the gastro-esophageal junction. The patient then underwent an esophago-gastro-duodenoscopy with

placement of a fully covered stent across the area of the leak. However, due to leakage of contrast over the proximal portion of the stent, a second stent was inserted into the first. He was subsequently discharged with the two stents and an abdominal drain in place. Due to his inconsistent oral intake, he was also placed on intravenous total parenteral nutrition (TPN) to supplement oral intake. Four weeks after stent insertion, M.M. underwent removal of the stents and injection of fibrin glue into the fistulous communication between the stomach and subcapsular cavity. An UGIS demonstrated resolution of the leak, and the patient was discharged five days later on a liquid sleeve gastrectomy diet, and ongoing TPN support. Subsequent UGIS, performed at two- and four-weeks post-stent removal did not demonstrate recurrence of the leak, and his diet was advanced to solid food. He has been doing well, having lost 88 pounds at the time of his six-month follow-up visit, with no additional complications.

Discussion: This case represents the development of a staple-line leak approximately six weeks after LSG in a patient on steroids and anti-coagulation for underlying medical problems. We suspect the leak was a direct result of pressure necrosis from the subcapsular hematoma that, in turn, caused infection of the hematoma. The leak was managed with endoscopic placement of fully covered stents, and the leak resolved one month later. Our institution has had several years of experience in using endoscopic stents to manage leaks after sleeve gastrectomy (SG). An IRB-approved, retrospective review of our institutional experience revealed 21 patients who underwent endoscopic stent placement for leaks after SG. The results demonstrated that staple line leaks presented at a median of 14 days post-operatively (range 1-1386 days). Additionally, the majority of the leaks, identified by EGD or radiologic imaging, occurred at the proximal portion of the staple line, just distal to the gastro-esophageal junction (n=16, 76.2%). Several patients (n=6, 28.6%) underwent a prior surgical washout of an associated intra-abdominal or intra-thoracic abscess, 3 patients (14.3%) underwent a prior percutaneous drainage procedure, and 4 patients (19.0%) had stents placed at an outside institution prior to be transferred to our care. Nine patients (43.9%) required either the addition of or exchange for one or more new stents. Two patients (9.5%) ultimately required operative revision with total gastrectomy and Roux-en-Y esophago-jejunostomy for management of their ongoing leaks.

Two patients were lost to follow-up. Of the remaining 17 patients, 88.2% (n=15) had complete resolution of their leak at a mean follow-up of 50.97+-12.33 days after stent removal.

Conclusion: Endoscopic stenting is a reasonable option for management of staple-line leaks after sleeve gastrectomy, including this unique case of a gastro-hepatic fistula, provided the patient is hemodynamically stable and able to tolerate placement of a stent.

A5072

Dehydration: A Cause for Concern

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"There are many potential Bariatric post-operative complications, but one that is most likely preventable pertains to dehydration. Dehydration occurs when the body loses too much fluid. Signs and symptoms of dehydration include: thirst, decrease in skin turgor, dry or cool skin, dry mucous membranes, constipation, low or minimal urine output, muscle cramps, tachycardia, hypotension, light headedness, feeling dizzy, headache, fever, nausea, malaise, diaphoresis, irritability, confusion, and in serious cases, delirium or loss of consciousness. Post operative monitoring of bariatric patients revealed a large number of these patients required one to three liters of intravenous fluid boluses. Furthermore, the nurses observed patients having difficulty voiding, or a urine output of < 100 cc with a foul odor and often a dark amber color. Several physicians and clinical staff theorized that the dehydration could be due to the patient's age, sex, surgeon, type of surgery (Laparoscopic Roux-En-Y versus Laparoscopic Sleeve Gastrectomy), time of day (surgery early in the day versus late in the day), comorbidities, and/or volume and types of IV fluid administered intra-operatively and post-operatively. These theories appeared inconclusive and did not demonstrate a definitive cause for the patient's dehydration. Consequently, the hospital's Bariatric Coordinator and the clinical nurse who observed the dehydration problem returned their focus to the already existing 'Bariatric Pre-Operative Education Class'. This class is a requirement for all future bariatric surgical patients. The power of education for the pre-operative bariatric patient can never be underestimated. With the limited length of the

hospital stay, it is critical that all future bariatric patients are thoroughly informed on how to prepare for surgery, their hospital experience, diet stages, how to recognize the basic needs of their bodies, and how to prevent complications. Nurses, as well as, medical staff should be sensitive to the potential lack of healthcare literacy and language barriers when educating bariatric patients. Furthermore, the entire clinical staff on the bariatric unit receives updated bariatric education and continuing education courses annually to assure that they are giving the best possible care to the post-operative patients as well as recognizing complications early. Several components of the Bariatric Pre-Operative Education Class presentation were changed. The topic of 'Dehydration' was added as one of the top four preventable complications. It was surmised that possibly the patients were already in a state of dehydration prior to arriving on their scheduled surgical day, thus the education was enhanced to include the following information: - The patient is instructed to drink plenty of fluids the day before surgery, resulting in increased urination, and light yellow to clear appearance of their urine. - Frequently, the majority of patients were found to have a lack of healthcare literacy and/or language barriers. The class information was changed to visually reflect what the 64 ounces (almost 2 liters) daily fluid requirement looks like by showing eight, 8 ounce cups (240ml) of fluid. Also the presentation reviews the signs and symptoms of dehydration in simple terms. - A 'Urine Color Chart' is placed in all the Bariatric bathrooms, as well as, in their gift bags for home to remind the patient to drink enough fluids, resulting in urine that will look light yellow to clear in appearance. - It is challenging to reach the goal of 64 ounces of fluid per day due to the small stomach pouch limiting the stomach capacity to accept fluids. Also, the patients are taught the 30/30 Rule, meaning they do not ingest fluids 30 minutes before a meal and wait 30 minutes after meals to prevent gastrointestinal symptoms and feelings of fullness. Consequently, patients are instructed to start drinking early in the day, sip fluids continuously during their waking hours, and to carry a beverage or sports drink with them at all times. They are also taught to be mindful if they are exercising or perspiring during warmer days, because the risk of dehydration quickly increases. - Beverages to avoid include carbonated drinks because they cause discomfort to the stomach. Caffeine should also be avoided because it can interfere with calcium absorption leading to a

deficiency and is also considered a mild diuretic. As a result of these improved educational actions, the hospital saw a dramatic decrease in the number of Bariatric post-operative and readmission dehydration cases. The clinical nurse role starts with pre-operative education and support on the patient's weight loss journey. By having a well hydrated Bariatric patient prior to surgery, it is possible to avoid the complication of dehydration post-operatively. Education and visual instruction could potentially decrease the number of hospital re-admissions related to dehydration. "

A5073

An aggressive peri-operative prophylaxis protocol limits clinically significant venous thromboembolic events in bariatric surgery patients

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An aggressive peri-operative prophylaxis protocol limits clinically significant venous thromboembolic events in bariatric surgery patients

Background: Pulmonary embolism (PE) is a leading cause of death after bariatric surgery. There is no universally accepted prophylaxis protocol. The purpose of this study was to assess the results of application of an aggressive clinical pathway in an MBSAQIP designated Center of Excellence. This is an update to a previous presentation in 2011 on 1584 patients.

Methods: We reviewed our prospectively collected database of 3,297 patients during a 12 year period, ending February 2016. By the pathway, all patients receive subcutaneous heparin prior to anesthesia induction, and post-operatively, along with pneumatic compression devices on bilateral lower extremities intra-operatively and when not ambulating post-operatively. Patients are aggressively ambulated within 3-4 hours of extubation and every 3-4 hours while in the hospital. Patients with Body Mass Index (BMI) greater than 50 Kg/m² or with a known inherited hypercoagulable disorder are discharged on enoxaparin, 40 mg

subcutaneously twice daily for 2 weeks. Those with BMI >60 are additionally treated with an inferior vena cava filter (IVC). All patients, including revisions were studied. Clinically significant thromboembolic complications at 90 days post-op were noted. Two patients in our bariatric database were excluded, since the VTE events occurred after a general surgery procedure, both had an umbilical hernia and panniculectomy performed, many months after the bariatric procedure.

Results: 3,297 patients were treated in this period, with a mean age of 45 years (range 16-81). Mean BMI was 45 Kg/m², (range 15-91). Most patients, 77%, (n=2,548) were female. Most of the surgeries were primary bariatric procedures (2649) with the rest being revisional procedures (648). Major surgical categories included laparoscopic Roux - en Y gastric bypass (800); robotic gastric bypass (283); laparoscopic sleeve gastrectomy (805); robotic sleeve gastrectomy (191); laparoscopic gastric banding (759) as well as various revisional procedures. There were 2 deaths in our database, both happening more than 4 weeks after the bariatric procedure, both patients had significant comorbidities, specifically heart disease. One patient underwent pelvic surgery unrelated to her bariatric surgery and had acute mesenteric ischemia with significant calcifications systemically. Another patient was doing very well but expired at home in his sleep with the family refusing an autopsy given his significant cardiac disease. Only three patients (0.09%) were found to have a PE and six (0.18%) had a DVT, including 1 of the patients with a PE. There were no deaths related to IVC filters.

Conclusion: This pathway appears to be associated with a very low risk of clinically significant thromboembolic complications. Validation studies at other centers are warranted.

A5074

Incidence of Early Complications after Bariatric Surgery Based on Different Classifications

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Background: Early complications after bariatric surgery are described as those occurring during the

first 30 days, and their incidence has been reported from 9 to 19%, depending the series. Although severe outcomes have decreased over time, there is still controversy on reporting such results. There is no clear consensus in the literature, and recently the ASMBS published their recommendations on how to report complications.

Methods: Retrospective study with charts from every patient submitted to bariatric surgery at a single institution. Data collection was performed prospectively from January 2013 to February 2016. An early complications analysis was performed and diverse classifications were applied to establish differences between outcomes rate. There were used 5 reporting models: LABS, BSCOE, ASMBS, major/minor and Clavien. A detailed analysis of complications was performed and main differences between classifications were exposed. An operative analysis was also described. Only patients submitted to laparoscopic gastric bypass (LGBP) and sleeve gastrectomy (LSG), without revisional surgery, were included.

Results: In a 3 years period, three-hundred and thirty-six patients were submitted to bariatric surgery. Two patients were initially excluded (one with only gastric band removal and one with revisional surgery), and the final analysis was performed in 334 patients. Female sex comprised 87.8% of cases, and a mean age of 38.5 years was observed. There were 91% of LGBP and 9% of LSG. Follow-up thought the first month was achieved in every case. There was no mortality, and the operative analysis showed 2 (0.5%) early reoperations (an incarcerated umbilical hernia and drainage of an infected hematoma). Bleeding (gastrointestinal) occurred in 7 cases (2%), with the need for transfusion in 5 of them (1.4%). Endoscopy was performed in 6 cases (4 in LGBP and 2 in LSG) with 4 dilations (only in the LGBP group). DVT occurred in one case without any pulmonary embolisms. Eight patients (2.3%) returned with a gastro-jejunal fistula without requiring reintervention /percutaneous drainage/readmission; such patients were treated conservative as outpatients. The complete outcomes analysis is observed in Table 1. Overall complications according to the models were: LABS (2.6%), BSCOE (0.2%), ASMBS (9.8%), Major/Minor (12.8%) and Clavien (11.9%). Models with sub-classifications or grades (ASMBS, major/minor and Clavien) were classified with severe outcomes in 5.3%, 10.1% and 2.9% respectively. The LABS and BSCOE only classify

complications as severe, with the percentages already described.

Conclusions: For our series, there is a low incidence in early overall complications after bariatric surgery but this can variate depending the classifications or model used. There is also an importance discrepancy in reporting rates for severe complications. For the overall and severe complications definitions, more unspecific models lead to less complications rate. More descriptive models should be used to improve complications reports and avoid bias in bariatric surgery outcomes.

A5075

OH NO! The case of the Roux-en-O as a cause of persistent gastrojejunal ulcer disease, nausea and vomiting.

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Introduction: It is well established that long term follow up after bariatric surgery is poor. There is an increasing number of bariatric patients that a bariatric surgeon may encounter, either through their emergency room or as a new patient seeking help for postoperative care. We report a patient that had a Roux-en-Y gastric bypass constructed incorrectly as a cause of chronic abdominal pain, nausea, vomiting, and persistent gastrojejunal ulcer that would have radiographically normal appearing anatomy. Being aware of this construction as a source of complaints in a patient presenting to you is important.

Methods: Our service was consulted to evaluate an inpatient with a history of a laparoscopic Roux-en-Y gastric bypass at an outside facility in 2013 with chronic abdominal pain, nausea, vomiting and active nonhealing gastrojejunal ulcers on long term bid PPI and Carafate elixir. In reviewing her records, there is documentation of her symptoms within two weeks of her primary operation. Since that evaluation, she has had three laparoscopies for small bowel obstructions at two different hospitals. On reviewing operative reports, no adhesions or internal hernias were identified. We performed EGD and found her to have a large gastric pouch and a widely patent gastrojejunostomy with several ulcers at the gastrojejunostomy. Upper GI series confirmed a large pouch but was otherwise normal. She requested reversal of her gastric bypass.

Results: At laparoscopy, the patient was found to have a retrocolic, retrogastric Roux-en-Y gastric bypass with two limbs emanating from the mesocolon and meeting at an anastomosis. These two limbs appeared contiguous. A limb was found to be traveling distally but did not appear contiguous with either limb but rather anastomosed to them. Following the ileocecal valve back to this anastomosis, the patient was found to have a 480cm common limb that was anastomosed to this u-shaped limb that started and ended at the mesocolon. None of the operative reports mentioned any bowel resections and her original operative report did not indicate any technical complications. The roux limb was identified by working from above the mesocolon, freeing up the mesocolic closure and delivering the roux limb thru the window. This helped us determine that her roux limb was to the left of the biliary limb and the total distance from the ligament of treitz to the gastrojejunostomy was 125cm with a 50cm biliary limb and a 75cm roux limb based on the anastomosis location. At the time of the original procedure, the small bowel was divided approximately 125cm distal to the ligament of treitz and then the proximal end was brought thru a window in the mesocolon to the gastric pouch. The distal bowel was then anastomosed to this loop about 50cm from treitz. To reverse her to 'normal anatomy', the gastrojejunostomy was taken down, a gastro-gastric anastomosis was performed, a pyloroplasty was performed, the roux limb was resected and the biliary limb was anastomosed to the common limb. She felt better immediately and at three week follow up has no pain and no difficulty with oral intake.

Discussion: When seeing patients that have not had their primary surgery performed by a known colleague, one must suspect unusual causes of patient complaints even in the presence of relatively normal radiographic and endoscopic anatomy. This patient had three negative laparoscopies prior to reversal due to failure to notice that the symptoms were not from a 'small bowel obstruction' but rather from an anatomically incorrect RYGB. This patient's symptoms were likely due to bile refluxing into her gastric pouch and food having to get to the enteroenterostomy against an anti-peristaltic 75cm roux limb. We would speculate that this is Roux-en-O gastric bypass was constructed unintentionally by the surgeon either being disoriented after dividing the small bowel or not understanding the proper anatomy. After reversal, she was left with 530cm of small bowel. In retrospect, we could have taken the

common limb off the U-shaped proximal small bowel and reattached the two ends leaving with her with another 75cm of small bowel.

A5076

Post-operative Bleeding Complications in Laparoscopic Sleeve Gastrectomy: Sources, Solutions and lessons learnt from a single cohort of patients.

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Objective: To review the presentation of post-operative bleeding complications after Laparoscopic Sleeve Gastrectomy (LSG) in a single cohort of patients and highlight the surgical and non-surgical methods of treatment.

Background: Post-operative bleeding is a major and infrequent complication in LSG. Bleeding may arise from various sources and poses a unique challenge in patients undergoing Bariatric surgery. There is paucity in the literature on management of this complication. The management of bleeding complications including investigation, operative, non-operative and endovascular solutions are discussed.

Setting: A major tertiary hospital in Singapore. Methods Patients who encountered post-operative bleeding complications from LSG were identified from a prospectively recorded database. The presentation, source of bleeding and methods to stop the bleeding were recorded and presented.

Results: 4 out of 330 (1.2%) patients were diagnosed with post-operative bleeding. 1 patient was treated conservatively requiring only blood transfusion and 3 patients were surgically explored with laparoscopy, no open conversions were required, time to re-operation was 12-33 hours from index operation: 2 were from staple line bleeding and suture hemostasis performed. In 1 patient the source of bleeding was not identified intraoperatively and CT angiography performed post-operatively showed active contrast bleeding near short gastric arteries and gastroepiploic artery. Mesenteric angiogram with cannulation of the right gastroepiploic artery

and short gastric artery via splenic artery showed active bleeding near the left diaphragm. Gel foam and coil embolization was performed and the bleeding was controlled. Average hospitalization stay due to post-operative bleeding was 7.6 days (range 6-9 days) compared to 2.3 days (range 1-7 days) for those without.

Conclusion: Post-operative bleeding after LSG occurred at the staple line and branches of the right gastro-epiploic artery and short gastric arteries. Management of post-operative bleeding requires clinical judgement. Bleeding may stop spontaneously or require hemostasis by operative or endovascular means. CT angiogram is proposed to locate the source of bleed and subsequent embolization of bleeding arteries maybe possible, avoiding the need for re-operation. However, bleeding from the staple line requires surgical hemostasis.

A5077

MORBIDITY AND MORTALITY OF GASTRIC SLEEVE AND BYPASS PATIENTS WITH SMOKING

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Background: As the popularity of weight loss surgery options such as the Roux-en-Y gastric bypass and the vertical sleeve gastrectomy increases, the risk-benefit analysis for patient selection becomes more important. Identifying significant pre-operative comorbidities is important in the patient selection process, especially for patients with coronary artery disease as well as peripheral vascular disease. Smoking plays a key factor in these disease processes, and warrants investigation in the selection process. This study is designed to analyze the risk factor of smoking within the patient population undergoing these procedures and how it affects post-operative success, recovery, and complications.

Methods: This is a retrospective cohort study with patients recruited from the Loma Linda University Healthcare Bariatric Surgery database. Data was collected from patients that received either the gastric sleeve or bypass procedure from July 2012 to July 2015. Inclusion criteria are patients above the age of 18 who underwent laparoscopic vertical sleeve gastrectomy or laparoscopic Roux-en-Y gastric bypass. Patients were excluded if they were

younger than 18 years or lost to follow-up within 30 days after surgery. Patients were separated into 3 groups determined by the following smoking status; never (Group A), former (Group B), or current (Group C). Current smokers were defined as patients actively smoking during initial consult. These patients were educated and counseled, and ceased smoking 6 weeks before the procedure. Follow-up was continued on all groups for a minimum of 1 year. The 3 groups were then analyzed for complication rates, and operative success using the Chi-Square method. Complications were graded as either early (within 30 days) or late (after 30 days), as well as major or minor. Major complications were assessed as reoperation, wound infection, leak, venous thrombosis, or death. All other complications were deemed minor.

Results: A total of 235 patients were collected, 149 in Group A, 71 in Group B, and 15 in Group C. Group A demonstrated a 24/149 (16.1%) complication rate, Group B had 12/71 (16.9%), and Group C had 1/15 (6.7%). The overall complications from the procedure was 37/235 (15.7%), there were no deaths. 10 of the complications were major complications, including 7 wound infections, 1 DVT, 1 leak, and 1 gastro-gastric fistula. 27 of the complications were minor, including dehydration, nausea, emesis, and diarrhea. 22 of the complications were early, and 15 were late. The chi-square statistic for the study is 1.0182, with a p-value of 0.601027. This shows no significance in the results between the groups.

Conclusion: Our study revealed that smoking status demonstrated no significant difference in morbidity or mortality outcomes in bariatric patients. With adequate education and tobacco cessation 6 weeks prior, patients can still successfully undergo bariatric surgery. Limitations of the study included a small sample size, retrospective nature, as well as short duration of follow-up (1 year). Additional factors that could be investigated include how long former smokers have quit smoking, and different levels of smoking stratified by pack years, as well as smoking status on efficacy of weight loss.

A5078

Neurologic Manifestations of Vitamin B Deficiency after Bariatric Surgery

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Introduction: Nutritional deficiencies are known complications after bariatric surgery. Neurologic manifestations of Thiamine (B1) deficiency have been reported in published case reports. However, the neurological disorders related to other vitamin B deficiencies in post-bariatric surgery patients are not well characterized. The aim of this study was to assess the incidence, clinical presentation, and outcomes of neurological disorders secondary to vitamin B deficiencies following bariatric surgery.

Methods: Post bariatric surgery patients who developed neurologic manifestations secondary to low levels of vitamin B1, B2, B6 and B12 were identified at a single academic center (2003-2015). Patients with non-nutritional neurological disorders were excluded. Data on baseline characteristics, perioperative variables, vitamin B serum levels, clinical presentations, and outcome of neurological disorders were retrieved and analyzed.

Results: Over a period of 12 years, 47 (0.7%) bariatric surgical patients developed neurologic manifestations secondary to vitamin B deficiencies. Forty (85%) patients were female, median age was 41 years (range, 21-67) and median preoperative BMI was 47 kg/m² (range, 36-78). Co-morbidities included hypertension (51%), sleep apnea (51%), dyslipidemia (43%), and diabetes mellitus without neuropathy (36%). Bariatric procedures performed were Roux-en-Y gastric bypass (n=36, 77%), sleeve gastrectomy (n=9, 19%), and duodenal switch (n=2, 4%). Four patients were noncompliant with the prescribed postoperative vitamin supplements. Median duration to onset of neurologic manifestation following bariatric surgery was 12 months (range, 2-75). Vitamin deficiencies reported in the cohort included B1 (n=30), B2 (n=1), B6 (n=12), and B12 deficiency (n=12). Eight patients had multiple vitamin B deficiencies. The most common neurological manifestations were paresthesia (n=31), muscle weakness (n=15), abnormal gait (n=11), and polyneuropathy (n=7). Seven patients required readmission for management of severe vitamin deficiencies. Four patients were diagnosed with Wernicke-korsakoff syndrome (WKS) which was developed after gastric bypass (n=3) and sleeve gastrectomy (n=1). Overall, resolution of neurological symptoms with nutritional interventions and pharmacotherapy was noted in 40 patients (85%). Seven patients showed clinical

improvement but no complete resolution of their symptoms. Six of them had vitamin B1 deficiency (WKS n=4, and peripheral neuropathy n=2) and one had dizziness secondary to vitamin B12 deficiency.

Conclusion: Nutritional neurological disorders secondary to vitamin B deficiency are uncommon after bariatric surgery. Among them, vitamin B1 deficiency is the most common form. While neurological disorders are reversible in most patients with nutritional interventions and vitamin replacements (85%), patients with WKS will have residual neurological symptoms.

Keywords: Bariatric surgery, vitamin B, deficiency, Wernicke-korsakoff syndrome, malnutrition, gastric bypass, neuropathy

A5079

The incidence of stricture and ulcerative disease at the duodenoileostomy in stomach intestinal pylorus sparing surgery and its successful management

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Introduction: Stomach intestinal pylorus sparing surgery (SIPS) is a modification of the duodenal switch (DS). There are no papers in the literature regarding strictures and ulcers at duodenoileostomy (DI) after DS. This paper presents the first four cases of stricture at DI after SIPS surgery and their management. Setting This report is a retrospective review from four private practice institutions by seven surgeons.

Methods: This was a retrospective analysis of 850 patients who underwent SIPS between 2013 to 2016. There were two techniques used. One was a totally hand sewn DI and the other was a partially stapled DI. Results There was a total of 10 patients who had the DI performed with a linear stapler. Of those 10 three had strictures at the DI. Of the remained 840 all were done with a hand sewn technique and one had stricture at the DI. That patient was a revision from an open bypass to a SIPS.

Management: EGD with balloon dilation was performed on all four patients. They were subsequently dilated in stepwise fashion starting with an 8 mm balloon and finishing with an 18 mm balloon (figure 1). Patients were kept on liquid diets for 24 hours and then instructed to resume their diets. All four patients are now 3 months out from EGD with dilation with no subsequent issues.

Conclusion: In our experience using a linear stapled technique can cause high rates of DI stricture. There are no cases in our series of primary hand sewn DI causing a stricture. There are also no cases of ulcerative disease in the small bowel past the DI regardless of DI technique. Stricture and ulcers after SIPS surgery should be much less than one percent. When strictures do occur it is safe to use balloon dilation to 18mm as primary treatment.

A5081

Gastroparesis after Duodenal Switch and its Management with Laparoscopic Pyloromyotomy
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Introduction: Duodenal switch (DS) is the most effective weight loss operation. Gastroparesis is a condition of partial or full gastro paralysis that causes poor gastric emptying. This condition is known. However, it is a rare complication seen after all types stomach surgeries. The treatment of this rare condition after DS has not been studied or reported on in the literature.

Objective: The objective of this study was to describe the surgical treatment of refractory gastroparesis in a patient who had formerly been morbidly obese and underwent RYDS.

Case presentation: A 41-year-old female with a body mass index (BMI) of 51.2 kg/m² underwent a RYDS for morbid obesity, diabetes mellitus and sleep apnea. Her BMI was reduced to 23.4 kg/m² with resolution of co-morbidities four years after surgery. After her primary surgery, she underwent multiple operations for recurrent hiatal hernias. Following these surgeries, three years post RYDS; this patient had multiple visits to emergency room for abdominal pain, chronic nausea and vomiting. One of the tests performed to evaluate the cause of her symptoms was Gastric emptying scintigraphy. This showed 78% of her food had not emptied at

three hours. Also, an Esophagogastroduodenoscopy (EGD) revealed stomach bezoar. After an extensive literature review, we felt that a Pyloromyotomy would be the most applicable treatment for this patient. Surgery After adhesiolysis the pylorus was located and a long full-thickness lengthwise incision was made in the pylorus extending onto both the duodenum and stomach. The lengthwise incision was stretched into a diamond shape by applying traction on the stay sutures, and then closed transversely with a single row of interrupted sutures. Schematic representation of laparoscopic Pyloromyotomy in this patient can be seen in Fig. 1.

Results: Operative time for this case was 41 mins. Blood loss was 5 ml and the postoperative course was uneventful and the patient was discharged on the second postoperative day. The patient is now 45 days out from surgery with a dramatic reduction in her chronic nausea and her daily vomiting has ceased.

Conclusion: Gastroparesis can occur after any bariatric surgical procedure. The DS allows gastroparesis treatment with a simple Pyloromyotomy.

A5082

PREOPERATIVE ANTIEMETIC PROTOCOL DECREASES EARLY POSTOPERATIVE READMISSIONS

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Introduction: Nausea, vomiting, and dehydration are a leading cause of readmissions after bariatric surgery and negatively impact patient satisfaction and institutional quality metrics. This study examined the effect of a preoperative antiemetic protocol on early postoperative readmissions.

Design: Data on all patients undergoing sleeve gastrectomy or gastric bypass were collected regarding the length of stay, antiemetic usage and narcotic usage. Data for 112 consecutive patients was collected prior to instituting an antiemetic protocol (control group). The initial protocol of preoperative scopolamine patch administration was instituted for the next 112 consecutive patients (scopolamine group). The protocol was modified for the next 112 consecutive patients by including the intraoperative administration of dexamethasone in addition to scopolamine patch placement (dexamethasone group). All groups were treated with narcotics and antiemetics independent of the study protocol and at the discretion of the attending surgeon.

Results: Data was collected from 336 consecutive patients. In the control group, 52.7% of patients required additional antiemetics on the day of surgery (postoperative day zero, POD #0). This rate was 47.8% in the scopolamine group and was 39.3% in the dexamethasone group. The length of stay beyond one day was 20% in the control group, 14% in the scopolamine group and 8.9% in the dexamethasone group. Readmission rates (within 30 days) were 9.8% in the control group, 4.5% in the scopolamine group and 2.7% in the dexamethasone group. Postoperative narcotic requirement showed a decrease from 4.73 doses to 4.53 and 3.96 doses, respectively.

Conclusions: A standardized protocol to include preoperative scopolamine patch and intraoperative dexamethasone administration reduced the number of patients requiring hospitalization beyond the first postoperative day by 56% compared to control and by 36% compared to scopolamine administration alone. The number of patients requiring readmission was similarly reduced with the addition of standardized scopolamine and dexamethasone (73% reduction compared with control). A standardized antiemetic protocol is effective in reducing readmissions and length of stay and should be considered in all bariatric surgical programs.

A5083

30 Day Readmission Following Weight Loss Surgery: Can Psychological Factors Predict Non-Specific Indications for Readmission?

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Although bariatric surgery is considered a safe and efficacious treatment option for severe obesity, 5% or more of patients are readmitted due to complications in the first 30 days. Some of these complications relate directly to surgical risks whereas others relate to more vague complaints or patient non-adherence. Such non-specific indications for surgery may reflect risks outside of the surgical procedure. A large literature has demonstrated that

bariatric surgery patients are a psychiatrically vulnerable population, though no studies to date have investigated whether pre-surgical psychosocial factors are related to readmission. Patients who had been initially evaluated by our program and readmitted within 30 days post-bariatric surgery during a 4 year period (2012-2015) were identified (n=102). These patients were matched (2:1) to 204 non-readmitted patients on pre-operative BMI (48.1 vs. 48.9 kg/m²), age (48.1 vs. 48.9 years), gender (73% vs. 74% female) and race (67% vs. 65% White). Psychiatric diagnoses, treatment history, binge eating pathology (as measured by the Binge Eating Scale; BES) and psychological testing (Minnesota Multiphasic Personality Inventory-2-Restructured Form; MMPI-2-RF) at intake were compared between the 2 groups using Chi-Square and t-test analyses. Further, amongst those readmitted, the indication for hospitalization was investigated via electronic medical record. Those with specific complications (e.g., leak, infection, DVT; n=68) were further delineated from those with vague complaints (e.g., pain, nausea) or complications that could relate to non-adherence (e.g., dehydration, misuse of medications; n=34). The 3 groups (no readmission, specific indication, non-specific indication) were compared on demographics, psychiatric variables and psychological testing via Chi-Square and analysis of variance (ANOVA). Individuals who were readmitted had less education (13.4 vs. 14.22 years; $t=2.15$; $p<.02$) than non-readmitted patients. Readmitted patients were less likely to be in outpatient psychiatric care (48%) compared to non-readmitted patients (64%; $\chi^2=6.76$; $p<.02$) and were on fewer psychiatric medications compared to the readmitted patients ($M=.60$ vs. 1.39 ; $t=22.74$; $p<.001$). Although matched on age and gender initially, those with non-specific readmissions were significantly younger (43.4 years vs. 49.25 in specific readmission vs. 48.9 in non-readmitted; $F=2.66$; $p=.05$) and more likely to be female (88% vs. 69% vs. 74%; $\chi^2=6.08$; $p=.05$). Significant differences were found on the Uncommon Virtues scale of the MMPI-2-RF which reflects a tendency to under-report psychiatric symptoms using a response style in which the patient denies minor imperfections that most individuals are willing to admit ($F=13.43$; $p<.001$). Those who were readmitted with non-specific complaints had significantly higher under-reporting

scores (M=64.14) compared to those with specific indications (M=59.74) which were greater than those not readmitted (M=55.11). Other MMPI-2-RF group differences and the effect of gender were no longer significant once the effect of under-reporting was removed. No significant differences were found on psychiatric diagnoses, the BES or number of weekly binge episodes although there was a trend for greater history of inpatient psychiatric hospitalizations in those who were readmitted (10.3%) compared to those who were not (5.4%; $\chi^2=2.45$; $p<.09$). Readmitted patients were more likely to psychologically present themselves in an overly positive manner, particularly among those who had non-specific indications for readmission. The tendency to under-report on psychological testing has been linked with under-reporting during the clinical interview and may also influence the veracity presented with nutrition, medicine and surgery (e.g., denying comorbidities, reporting adherence although not following treatment plan). This under-reporting style may impact the bariatric team's ability to identify risk factors that could be ameliorated prior to surgery. Similarly, patients who are readmitted were less likely to be receiving mental health care and psychopharmacology although they may be more likely to have had a significant past history of psychiatric hospitalization. Such ongoing treatment may increase monitoring and/or adherence. Finally, younger patients were more likely to be readmitted for non-specific reasons. Future research should examine better strategies for identifying patients at risk for readmission and for reducing an under-reporting style during the evaluation period.

A5084

Closed loop small bowel obstruction and dehiscence of jejunojejunostomy from blood bezoar after laparoscopic roux-en-y gastric bypass for morbid obesity

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Introduction: Intraluminal staple line bleeding is not uncommon after laparoscopic roux-en-y gastric bypass. Potential sources of bleeding include staple line of the gastric pouch, gastro-jejunoanastomosis, staple line of the remnant stomach and jejunojejunostomy anastomosis. This is usually self limited and rarely causes severe complication. We present a case of closed loop small bowel

obstruction (SBO) from blood bezoar at jejunojejunostomy due to bleeding at jejunojejunostomy staple line complicated by dehiscence of jejunojejunostomy, following elective laparoscopic roux-en-y gastric bypass done for morbid obesity.

Case preparation: We present a case of 48 year old female patient with history of morbid obesity, symptomatic cholelithiasis and hypertension, who presented for elective laparoscopic roux-en-y gastric bypass and cholecystectomy. Patient underwent uneventful antecolic-antegastric laparoscopic roux-en-y gastric bypass and cholecystectomy. Jejunojejunostomy was created using the Endo GIA[®]; tan reloads with Tri-Staple[®]; Technology. Gastrojejunoanastomosis was created with Endo GIA[®]; purple reloads with Tri-Staple[®]; Technology, along with anterior and posterior layers with non-absorbable suture in running continuous fashion. POD#1 patient had one episode of melanic bowel movement. Subcutaneous heparin and ketorolac were discontinued. Hematocrit dropped from preoperative value of 46 to 32, but stayed stable x 3 post-operatively. Vital signs were stable and urine output was adequate. Patient was made NPO and monitored closely. POD#2 patient had one episode of vomiting and increasing abdominal discomfort. This prompted a CT angiogram of abdomen/pelvis to look for active bleeding and SBO. This revealed no active bleeding, blood clot at jejunojejunostomy and SBO of both alimentary and biliary limbs, with closed loop obstruction of biliary limb. Patient was mildly tachycardic to 110s because of discomfort from abdominal pain and vomiting. She was taken to the operating room immediately. Just prior to induction of anesthesia, she became septic, with heart rate up to 160s. On opening the prior laparoscopic incisions, succus was seen. We started laparoscopically, but due to lack of visualization from distended bowel loops we quickly converted to open procedure. There was dehiscence of jejunojejunostomy staple line. About 400ml of blood clot was evacuated from the perforated anastomosis. Revision of jejunojejunostomy was performed with Endo GIA[®]; tan reloads with Tri-Staple[®]; Technology. Gastrojejunoanastomosis, alimentary limb and biliary limb were inspected and no gross abnormalities found. Abdomen was washed with normal saline and closed in layers. Patient was started on pressors and antibiotics because of septic shock, and transferred to SICU. Patient recovered eventually, extubated and started on clear liquid

diet, and later advanced to pureed diet. She had a prolonged hospital course complicated by bilateral foot drop. She was discharged to rehab facility on POD#21.

Conclusion: Bleeding from staple line causing blood bezoar, SBO and perforation of jejunum-jejunosomy is very unusual complication. Bleeding at staple line is not uncommon but generally self limiting. However, this should be a differential diagnosis in patients post roux-en-y gastric bypass presenting with early SBO. A naso-gastric tube may decompress alimentary limb but will not decompress the biliary limb leaving the patient with closed loop obstruction. One needs to have high index of suspicion and low threshold to evaluate for complications. Emergent operative exploration is necessary to prevent further complications.

A5085

COMPLICATIONS IN 3189 CONSECUTIVE PATIENTS IN A METABOLIC AND BARIATRIC CENTER OF EXCELLENCE IN BRAZIL SUBMITTED TO BARIATRIC SURGERY

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Introduction: Bariatric surgery is the most effective and safe method to treat morbid obesity and its comorbidities. The risks of complications and mortality are associated to many factors regarding both patients' condition and surgical procedure, including age higher than 65 years old, comorbidity with conditions such as cardiovascular, lung, hepatic and kidney diseases, previous abdominal surgical procedures, and also to the expertise of the surgical team, especially concerning diagnosis and treatment of complications.

Methods: Since January 2013 to December 2015, we have performed 3189 bariatric surgeries in a bariatric and metabolic center of excellence in Brazil - (Sallet Institute of Medicine / Victoria Hospital and other three hospitals in São Paulo). We have performed quantitative and qualitative analysis of perioperative complications observed in these patients, including bleeding, intestinal obstruction, fistulae, infections, thromboembolic events, and mortality.

Results: Of the 3189 patients operated, there were 127 patients suffering perioperative complications (3.9%). From them, 101 (3.1%) presenting nausea/vomits, dehydration, thromboembolic

events and bleeding were observed and clinically resolved. Twenty-six patients (0,8%) showing bleeding and intestinal obstruction were treated surgically. There was an intraoperative complication related to iatrogenic spleen lesion, treated by mean of conversion to an open technique necessary to splenectomy, with good evolution. There was no mortality.

Conclusion: We have a low incidence of complications and hospital readmissions (3.9%) when we compare with another bariatric excellence centers. The complications who needed surgical intervention were 0.8% and all of them had a good evolution. There was no mortality.

A5086

Bariatric Surgery in the community hospital of excellence designation can be performed safely with no mortality and excellent outcomes.

Mesenteric thrombosis was far and away more prevalent than gastrointestinal leak in our experience. Jeffrey D. Baker, M.D., Jon Gipson, M.D., Daniel R. Baker, M.D., Fredrick Johnson, M.D., Laura V. July, M.D., Lynn Shriver, BSN, R.N., Darla Schmitz, BSN, R.N., Diane Gladhill, R.N., Margaret Moga, PA-C. Allina Bariatrics, Unity Hospital Bariatric Program, Fridley, Minnesota
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Background: Bariatric surgery is a safe effective long term means of weight loss for the morbidly obese patient. It has been shown that dedicated surgeons/dedicated hospitals following multiple disciplinary approaches established for Excellence continue to improve bariatric surgical outcomes. The aim of this paper is to retrospectively review the last 10 years of a single practices weight loss operations, performed in a single community hospital setting, with COE accreditation (2005,2008,2011)/MBSAQIP accreditation (2014). The results demonstrate that bariatric surgery can be safely performed in a community hospital with low morbidity, no mortality and excellent outcomes (LOS, 30 day readmission rate, 30 day reoperation rate, low ICU need and 1, 3, 5 year percent EWL) that may redefine the standards of weight loss surgery in the community care setting. Our 10 year results also showcase the evolution of weight loss surgery from the open era to laparoscopic surgery and from the RNY gastric

bypass through the band to the sleeve gastrectomy as now the most popular of the operations requested.

Methods: This is a retrospective accounting of five dedicated general surgeon's bariatric surgical experience spanning the past 10 years at Unity Hospital, a 275 bed community hospital of Excellence designation. Unity is a hospital located just north of Minneapolis MN in Fridley MN and is one of the first hospitals in Minnesota to obtain COE designation (August, 2005) and today remains accredited in excellence by MBSAQIP. Of the 4809 Bariatric operations performed at Unity over the past 10 years, 4455 were primary operations. These primary operations performed include open RNY (n =722, (16.2 %)), laparoscopic RNY (n = 1728, (38.79%)), gastric banding (n = 793, (17.8 %)), revision weight loss surgery (n = 436, (9.8 %)) and sleeve gastrectomy (n = 776, (17.42%)). The average patient age was 43.2 years old (range 18-87). The average BMI was 45.4 (range 18-86). 83.2 % of these patients were female.

Results: The average hospital LOS of all primary operations was 1.7 days. Patient follow up at 12 months was 94.91%. Weight loss was excellent with an average EWL% at 12 months for the Laparoscopic RNY - 74.21%, Open RNY - 70.26%, Sleeve Gastrectomy - 64.61%, and Laparoscopic Gastric Band - 37.62%. Most importantly there were no 30 day or 90 day perioperative deaths. In the 30 day postoperative time frame there were 337 (7.6%) post-surgical complications requiring clinic attention, ambulatory care and/or hospitalization with 191 (4.3%) readmissions of which 55 (1.2%) patients required reoperation. Surprisingly gastrointestinal leak (n =1, 0.02 %) was not the most common serious complication in the early 30 day post-surgical period, mesenteric thrombosis (n =7, 0.2%) was. Abdominal pain was the most common reported subjective complaint while dehydration was the most common reported objective complaint. The incidence of patients requiring post-surgical cholecystectomy was 2.2 % in our surgical population.

Conclusion: Bariatric Surgery performed at a community hospital of COE/MBSAQIP designation can be done safely, economically, with excellent outcomes, and no mortality, all which may redefine bariatric surgical standards in the community hospital setting. Despite our real concern of gastrointestinal leak, mesenteric thrombosis was far and above the most prevalent serious postsurgical complication in this review.

A5087

Staple line reinforcement in laparoscopic sleeve gastrectomy. Experience in 939 consecutive patients

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Background: Leaks and bleeding are major complications in sleeve gastrectomy (SG), and staple line reinforcement (SLR) has proven to be effective in preventing it. The objective of this study is to present the complications of SG after suturing the staple line.

Methods: Retrospective series. Records of patients who underwent laparoscopic SG between January 2010 and march 2016 were reviewed. All of the procedures were performed by the same team in the same fashion, using imbricating suture as SLR. Intra and postoperative complications are reported.

Results: 939 consecutive patients met the inclusion criteria. 67.3% were female. Mean preoperative BMI was 37 kg/m². Mean operative time was 70 minutes (30-180). Mean suturing time was 11.8 minutes. Overall complications were 26 (2.8%), 1.9% were postoperative. Main complications were hemoperitoneum (two surgical and 3 medical treatment), vomiting (0.4%), and incisional hernia (0.2%), 1 hemothorax and 1 pneumothorax. There were no leaks in this series.

Conclusion: Imbricating suture as staple line reinforcement can contribute to a low surgical complications rate. Complications in SG can be minimized by a standardized technique and surgeon's experience.

A5088

Title: A Case Study: Management of a bile leak after partial cholecystectomy in a patient status post Roux-en-Y gastric bypass surgery with a controlled choledochocutaneous fistula

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Introduction: In this case we will discuss post operative management of a patient who underwent a partial cholecystectomy secondary to acute gangrenous cholecystitis. This case is complicated by the fact the patient had a previous history of

gastric bypass surgery, limiting the options of treatment of cystic duct leak post operatively. We will discuss the details of our patient, the complications of his procedure and the means by which we manage a bile leak when previous gastric bypass surgery prevents treatment by conventional treatment pathways. There are very few cases such as this in literature today, which calls for further investigation and research.

Case Description: Patient is a 46 year old male who presented with complaint of right upper quadrant abdominal pain, vomiting, and diarrhea for three days. Patient has a significant past medical history of Morbid Obesity for which he underwent a Roux-En-Y gastric bypass for weight loss. Patient also reported surgical history of bilateral above knee amputations and umbilical hernia repair. Patient states he lost approximately 500 pounds with the gastric bypass. Upon admission, patient received abdominal ultrasound which revealed distended gallbladder with calculi and positive sonographic Murphy's sign, consistent with acute cholecystitis. Patient was scheduled for a laparoscopic cholecystectomy. Intra-operatively, gallbladder was found to be perforated, gangrenous and extremely friable. Also, the anatomy was difficult secondary to previous bypass operation. Due to the severity of inflammation, the decision was made to perform a partial cholecystectomy, leaving the base of the gallbladder remaining on the liver bed. A JP drain was placed in the gallbladder fossa coinciding with the stump of the cystic duct to drain excess bile, and to facilitate the formation of a controlled fistula. Patient did well post-operatively, was placed on octreotide for control of fistula output. On follow up, the patient reported slowing of bilious drainage, and after 6 weeks of monitoring bilious drainage via the jackson-pratt, the drain was slowly pulled out to create a controlled cholecystocutaneous fistula. Further follow up revealed resolution of the controlled fistula.

Discussion: In many studies it is proven that laparoscopic partial cholecystectomies are a viable option over conversion to open cholecystectomy in difficult cases with similar results longterm in relation to length of stay and post-operative complications. In these cases bile leaks from the common bile duct are common if the bile duct cannot be controlled intra operatively. Studies show standard of care for bile leak after cholecystectomy is endoscopic retrograde cholangio-pancreatography with imaging and stenting. In our case, this is complicated by the fact the patient had a previous

Roux-en-y gastric bypass making it unable to treat with conventional treatment. In reviewing the literature, there are not many studies involving this type of patient population. In the case of our patient, we were unable to identify the cystic duct intraoperatively and knowing ERCP was not an option, the decision was made intra operatively to place a Jackson-Pratt drain in the gallbladder fossa to monitor the output. This allowed for a controlled choledochocutaneous fistula for management of bile leak until the body could normalize the new bile flow. In a literature review, no cases were obtained using this approach, demonstrating the need for more investigation into difficult cases involving patients after gastric bypass surgery with laparoscopic cholecystectomy.

Conclusion: There are few cases reported in which bile leaks are managed status post partial cholecystectomy in a patient with history of gastric bypass surgery. In the case being presented, a controlled choledochocutaneous fistula was used with a Jackson-Pratt drain to control an expected post-operative bile leak after partial cholecystectomy in a patient with acute gangrenous cholecystectomy. In this case, there was a satisfactory outcome with the method used. In a literature review there were not many cases presented demonstrating treatment for bile leak in a patient status post bariatric surgery. In the case presented, a viable option that has little to no research is demonstrated. This case presentation demonstrates the need for further investigation into options for management of bile leak in laparoscopic partial cholecystectomy in a patient population status post gastric bypass surgery, all while presenting a possible viable option of choledochocutaneous fistula.

A5089

Utilizing MBSAQIP Data to Evaluate Venous Thromboembolism Prophylaxis in Bariatric Patients at a Single Institution.

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Introduction: Patients with obesity are at increased susceptibility of developing deep vein thrombosis (DVT) and venous thromboembolic events (VTE) due to their body habitus, potential acquired or genetic hypercoagulable states, and the surgical procedure

itself. In literature, there have been many protocols for DVT/VTE prophylaxis but a general consensus has never been reached. In this study, we describe our experience with the use of moderately higher dose of low molecular weight heparin (LMWH) with longer duration for DVT/VTE prophylaxis, its safety and efficacy in higher risk bariatric surgery patients.

Methods: Retrospective data was collected utilizing the MBSAQIP database from June 2012 through September 2015. All patients undergoing Roux-en-Y gastric bypass (RNYGB) and sleeve gastrectomy (SG) at a single center were included. Complications analyzed were post-operative bleeding, DVT, PE, and death. All patients received sequential compression devices (SCD) starting in the operating room, 5000 units of unfractionated heparin subcutaneously (SC) pre-operatively and were mobilized two hours after surgery. Patients with a BMI ≥ 40 received LMWH 60 mg SC every 12 hours post-operatively and one additional week after discharge. Patients with a BMI of 35 - 39.9 received LMWH 40 mg SC every 12 hours post-operatively and one additional week after discharge. Patients with a personal history of DVT/VTE received additional LMWH 60 mg SC every 12 hours for 2 to 4 weeks after discharge.

Results: There were 746 bariatric surgery cases reviewed. Our results were compared to results of other MBSAQIP verified centers during the same time period. 436 patients underwent laparoscopic Roux-en-Y gastric bypass (RNYGB), 20 patients underwent open RNYGB, 290 patients underwent laparoscopic sleeve gastrectomy. 80.3% of patients were females, 19.7% males. Mean BMI was 47.5 (SEM 8.1). Seven patients had a history of PE (0.9%); 10 patients had a history of DVT requiring therapy (1.3%). 744 patients reported being functionally independent prior to surgery (99.7%), 2 were partially dependent (0.3%). Of the 746 patients undergoing bariatric surgery at our institution, anticoagulation for 5 patients (0.67%) was initiated for presumed/confirmed DVT/PE. Of these 5 patients, 0 had PE; 3 had confirmed DVTs. As compared with the other MBSAQIP sites, our site has a lower incidence of VTE (0.67% vs 1.0%). Eight patients (1.1%) developed postoperative bleeding complications within 30 days postoperatively. No mortality occurred.

Conclusions: The use of moderately higher dose of lower molecular weight heparin (LMWH) with longer duration for DVT/VTE prophylaxis used in our institution seems to be safe, effective and with a low complication rate.

A5090

Effect of a Mobile Health Patient Engagement Tool for Postoperative care of Bariatric Surgery Patients

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Background: Engaging patients in self-care processes can increase self-awareness in their recovery process. This may lead to earlier recognition of postoperative concerns, prompting patients to seek appropriate medical help earlier. The objective of this pilot study was to develop a mobile app to help patients manage their recovery at home after bariatric surgery.

Methods: A total of 116 bariatric surgery patients installed the mobile app on their device at hospital discharge. Participants were asked to complete a daily health check for 30 days using the app. The app generated alerts and instructions based on the patient's symptoms. A patient education library provided self-care information. Outcome measures included app usage and alert compliance. Readmission to hospital was compared to a historical control group.

Results: There were no significant differences between the intervention and control groups on age, sex, BMI, and bariatric surgical procedure. Patients had high app engagement during week one (75.9%) and maintained an average rate of 49.5% over the 30 days. The most frequently captured postoperative patient concerns were no bowel movement and gas pain. Patients highly recommended the app (98%) and 77% favorably rated the app in helping to manage their recovery. There was no significant difference in readmission rates between groups.

Conclusion: Patient engagement with a mobile app following bariatric surgery was highest during the first week, with most recommending use of the app in the future. Mobile app use did not decrease readmission rates as part of this pilot study.

A5091

Outcomes following laparoscopic conversion of Roux-en-Y gastric bypass to biliopancreatic diversion with duodenal switch

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Background: The Roux en Y gastric bypass has been performed for decades. Many patients experience weight regain or never achieve their ideal body weight following surgery. The biliopancreatic diversion with duodenal switch (BPD-DS) is a more malabsorptive procedure than the gastric bypass as greater than 60% of the small bowel is bypassed whereas only 10-15% is bypassed with a gastric bypass. The BPD-DS has been shown to have more robust weight loss and better long-term weight loss when compared to the gastric bypass. Concern exists regarding vitamin deficiencies. Conversion of a gastric bypass to a duodenal switch is one revisional operation that is offered to bypass patients with weight recidivism and persons with persistent obesity postoperatively.

Methods: 18 patients underwent elective laparoscopic revisions of Roux en Y gastric bypass procedures to a biliopancreatic diversion with duodenal switch (BPD-DS). Electronic health records were reviewed retrospectively. Postoperative nutrition labs were performed that included vitamin A, D, E, K, thiamin, folate, B12, ferritin, PTH, copper, zinc and selenium levels.

Results: No mortalities were seen postoperatively. One patient experienced a leak at the gastrogastrostomy that was treated with endoscopic stent placement. Two patients had early postoperative small bowel obstructions. Mean initial BMI was 46.56 kg/m². Mean BMI change was 10.08 kg/m². Mean excess weight loss was 44.44%. One patient underwent surgery for recalcitrant ulcer while all others had it performed for weight recidivism. Three patients had resolution of hypertension while one had remission of diabetes mellitus. Postop follow-up time varied between 1 and 21 months. Three patients were lost to follow-up after a month. Vitamin deficiencies were found in 6 patients. Two patients had vitamin D deficiencies, two had zinc deficiencies, two had vitamin K deficiencies and one patient had vitamin A deficiency.

Conclusions: For those patients who have had Roux en Y gastric bypass and postoperatively develop weight recidivism or do not achieve adequate weight loss a conversion to a duodenal switch may be a viable option. Complications overall were minimal. Vitamin deficiencies were fairly mild and treated with oral supplements. This patient group is marked

by a propensity for non-compliance. Thorough preoperative preparation with nutritional and psychological counseling will be crucial to ensure success. Further study is needed to look at long-term outcomes.

A5092

A novel 15mm trocar port closure technique to prevent incision complications after bariatric surgery

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Background: Trocar site pain and hernias after laparoscopic bariatric surgeries is common because of the thick, fatty preperitoneal space and elevated intra-abdominal pressure. The incidence ranged from 0.14 to 8 % in literature. Hand suturing is time-consuming and may be unsuccessful at times, and trocar site closure devices are expensive and are not well-suited for use in morbidly obese patients. Moreover, most of these devices are not available in market in the developing countries like China.

Objectives: We describe a novel convenient peritoneal closure technique which could prevent these complications without using expensive wound closure devices.

Methods: We retrospectively analyzed the clinical data in all laparoscopic bariatric surgeries (sleeve gastrectomy and gastric bypass) performed by a single surgeon. The technique: An elongated stainless steel hook was completely penetrating the thick abdominal wall to the fascial layer at an optimal distance from the wound and suture with the help of a grasper. Pain score, analgesic usage, cosmetic satisfaction and other clinical outcomes were evaluated.

Results: This technique was performed in 179 cases (83 males, 96 females; 113 LRYGB, 66 LSG) with mean body mass index (BMI) 40.3±10.4 kg/m². 17 cases (9.5%) required additional analgesic in the post-operative period, no significant difference between the two procedures (P=0.603). Cosmetics results were satisfactory with average score 9.3 out of 10. There were no port site related complications on clinical examination during two-year follow up.

Conclusion: This peritoneal closure technique offers an economic, safe and quick alternative to suture the trocar wound defects after bariatric surgeries. In addition it reduces the incidence of port site pain and hernias and enhances recovery.

A5093

Safety and Effectiveness of Anterior Fundoplication Sleeve Gastrectomy in Patients with Severe Reflux

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Introduction: Laparoscopic sleeve gastrectomy (LSG) has become a popular bariatric surgery in recent years. However, it has been linked to worsening of, or newly developed gastroesophageal reflux disease (GERD) in the postoperative period. Our practice has published a case report, and presented in many meetings about the techniques of performing anterior fundoplication at the time of sleeve gastrectomy to prevent worsening of GERD symptoms. The purpose of this study is to determine the safety and effectiveness of anterior fundoplication sleeve gastrectomy (AF-SG) in patients with reflux.

Material and Methods: We prospectively collected data on 30 sleeve gastrectomy patients who concurrently underwent anterior fundoplication between July 2014 and March 2016. Patients were selected when they complained of severe reflux prior to the procedure. Each patient was interviewed for the GERD score questionnaire (scaled severity and frequency of heartburn, regurgitation, epigastric pain, epigastric fullness, dysphagia, and cough) before and 4 months after the procedure.

Results: Our patients consisted of 26 females and 4 males with a mean age of 49.9±1.8 years (range, 28-63). They had a preoperative body mass index of 42.5±5.5 kg/m² (range, 33.3-58.4), and 66.7% (n=20) of these patients underwent hiatal hernia repair as well. Preoperatively, patients had a mean heartburn score of 6.7±3.6 (range, 0-12), regurgitation 5.9±4.2 (range, 0-12), epigastric pain 1.6±2.6 (range, 0-9), epigastric fullness 2.5±3.1 (range, 0-12), dysphagia 0.9±2.3 (range, 0-9), and cough score of 0.8±1.7 (range, 0-6). Mean preoperative GERD score was 17.6±8.6 (range, 6-36) in these patients. Postoperatively, patients were interviewed with the same questionnaire approximately 4 months after the procedure. Patients had a mean heartburn score of 1.6±3.4 (range, 0-12), regurgitation 0.8±1.7 (range, 0-8), epigastric pain 0.6±1.7 (range, 0-8), epigastric fullness 0.9±2.4 (range, 0-8), epigastric fullness, 0.2±1.2 (range, 0-6), and cough score of 0. Mean postoperative GERD score dropped down to 4.1±6.0 (range, 0-28), and the difference was statistically

significant ($p < 0.01$). No patients required readmission or reoperation due to the procedure within 30 days.

Conclusion: Anterior fundoplication sleeve gastrectomy (AF-SG) may be a safe and effective alternative in obese patients with severe reflux who wants to undergo sleeve gastrectomy.

A5094

Laparoscopic versus Robotic Cholecystectomy in the Obese Population: Is there a preferred approach?

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Introduction: Since the early 1990's, laparoscopic cholecystectomy (LC) has been considered the gold standard treatment for gallbladder disease. Laparoscopic surgery can be challenging in patients with obesity. Robotic cholecystectomy (RC) is a safe alternative to LC. The robotic approach offers several advantages over laparoscopic surgery including three-dimensional vision, wrist-like movements, improved ergonomics and elimination of the fulcrum effect, which may be advantageous in patients with obesity. The aim of this study was to compare robotic to laparoscopic cholecystectomy with regards to intra- and postoperative outcomes in patients with obesity.

Methods: All patients with body mass index (BMI) ≥ 30 kg/m² who underwent multiport LC or da Vinci (Intuitive Surgical Inc, Sunnyvale, California) RC between January 1, 2014 and December 31, 2015 were retrospectively reviewed at our institution. Patients who underwent single site procedures (laparoscopic or robotic) and cholecystectomies with intraoperative cholangiograms were excluded from the study. Patient demographics, American Society of Anesthesiologist (ASA) score, BMI, surgical pathology, operating room time, conversion to an open procedure, length of postoperative hospital stay (LOS), 30 day morbidity, mortality and emergency room readmission were included for analysis. Patients were also divided into groups based on BMI (30-39, 40-49, >50 kg/m²) for subset analysis.

Results: A total of 1,133 patients were included, 954 underwent LC and 179 underwent RC. The

demographic profile of the two groups was similar except for a higher average BMI in the RC arm (38.8 vs 36.8 kg/m², $p < 0.01$). LC was performed more for acute cholecystitis (11.7% vs 6%, $p = 0.027$) and RC for chronic cholecystitis (93% vs 87%, $p = 0.022$). The operative time was significantly greater for RC (80 vs 62 min, $p < 0.01$). LOS was significantly shorter for RC (0.23 vs. 0.58 days, $p = 0.007$). Patients who underwent RC were less likely to be readmitted within 30 days for abdominal pain (0.55% vs. 3.2%, OR=5.978, 95% CI [0.811-44]) and more likely to have retained common bile duct stones (1.7% vs 0.21%, $p = 0.03$). There was no statistically significant difference between RC and LC with regards to mortality, conversion to open, postoperative bile leak, postoperative hemorrhage, postoperative emergency room visits, or readmission for dehydration, surgical site infection, nausea, constipation, incisional bleed, intra-abdominal abscess, fever, or urinary retention. On subset analysis, LOS was shorter for patients who underwent RC with a BMI between 30-39 kg/m² (0.26 vs 0.61 days $p = 0.035$). There was no difference in LOS in the higher BMI subgroups. Retained common bile duct stone was more common after RC in the BMI 30-39 kg/m² subgroup (2.6% vs 0.27% $p = 0.021$).

Conclusion: RC is a safe alternative to LC in the obese population. While there was a significant difference in LOS in favor of RC, it was clinically insignificant. Patients who underwent RC had a longer operating room time, higher rate of retained common bile duct stones and were 6 times less likely to be readmitted for abdominal pain.

A5095

Analysis of glucose variability and weight recovery after bariatric surgery

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Background: There is significant weight recovery (WR) after bariatric surgery. Glucose fluctuation has been proposed as contributing factor, but most of it comes from self-reported symptoms in clinical practice.

Objectives: To characterize glucose patterns and their association with WR in subjects with bariatric surgery.

Methods: We performed continuous glucose monitoring (CGM) from 3-7 days in patients with long-term follow-up (2-7 years) after Roux-en-Y gastric bypass who were weight stable (WS, WR $\leq 7\%$) or had WR ($\geq 10\%$). Patients did a detailed self-monitor of diet and physical activity during the CGM. We correlated glucose variability indexes MAGE (Mean amplitude of glycemic excursions), and CONGA (Continuous overall net glycemic action) with clinical and metabolic parameters.

Results: We Included 15 subjects who were WS (n=10, 66% women, mean age 39.7 \pm 6.1, mean body mass index [BMI] 32.5 \pm 3.0) or had WR (n=5, 80% women, mean age 38.2 \pm 5.1, mean BMI 38.4 \pm 4.5). Patients with WR had higher insulin levels (6.3 \pm 1.5 vs 4.5 \pm 1.0 μ U/L, $p = 0.01$) and HOMA (1.3 \pm 0.3 vs 1.3 \pm 0.3, $p = 0.03$), and lower HDL-cholesterol (42.8 \pm 5.8 vs 42.8 \pm 5.8 mg/dL, $p = 0.02$). There were no significant differences in minimum interstitial glucose (56.6 \pm 10.5 mg/dL vs 63.6 \pm 10.8 mg/dL), mean interstitial glucose (103.5 \pm 18.2 vs 103.8 \pm 11.7 mg/dL), maximum interstitial glucose (204.8 \pm 75.8 vs 233.6 \pm 53.4 mg/dL), % time in hypoglycemia (< 70 mg/dL) (14.0 \pm 14.9 vs 3.6 \pm 6.9%), % time in hyperglycemia (> 140 mg/dL) (9.3 \pm 13.5 vs 7.6 \pm 6.0%), % time with glucose > 200 mg/dL (2.11 \pm 4.9 vs 1.5 \pm 2.5%), MAGE (66.6 \pm 21.9 vs 67.0 \pm 29.8 mg/dL, range reported in lean adults 26.9 \pm 12.4 mg/dL), and CONGA (90.4 \pm 15.9 vs 90.7 \pm 8.8) in patients who were WS and had WR, respectively. Patients with higher MAGE values (≥ 70 mg/dL) had longer follow-up time (5.7 \pm 1.2 vs 4.9 \pm 1.3 years, $p = 0.009$), % time with glucose > 200 mg/dL (4.7 \pm 0.2 vs 0.1 \pm 0.2%), and reported higher kilocalories (2260 \pm 646.8 vs 1781 \pm 149.4 kcal) and protein (105 \pm 38.8 vs 68.7 \pm 12.2 g) intake, but not in carbohydrates, refined carbohydrates, and fiber, and there were no differences in fasting glucose, fasting insulin, HOMA, HbA1c, blood lipids, and % body fat. The following are clinical and metabolic correlations with MAGE: Age (0.02), years since surgery (0.48), %WR (-0.16), fasting glucose (-0.11), fasting insulin (0.13), HOMA (0.11), HbA1c (-0.20), total cholesterol (0.19), triglycerides (-0.02), HDL-cholesterol (0.004), LDL-cholesterol (0.20), minimum BMI after surgery (-0.38), % body fat (0.06), CONGA (0.44), minimum interstitial glucose (-0.37), maximum interstitial glucose (0.81), kilocalories (0.19), carbohydrates (-0.10), proteins (0.39), lipids (0.31), fiber (0.15), and refined carbohydrates (-0.44).

Conclusions: The use of CGM helps detect significant glucose variability in patients with bariatric surgery.

These indexes have been associated with cardiovascular risk and it is not correlated with conventional parameters measured for metabolic control. There was no association with glycemic variability and WR.

A5096

NEW MAGNETIC TECHNOLOGY FOR BARIATRIC SURGERY FIRST ADOPTION IN A SURGICAL CENTER

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Introduction: The Magnetic Surgical System (Levita Magnetics Corp) is a new technological platform that uses magnetic fields to enhance mobilization during surgery. The system allows for un-constrained, shaft-less magnetic retraction and mobilization of organs that overcomes the limitations of conventional laparoscopic instruments. The Magnetic Surgical System increases the range of motion for traction as the instrument is not limited by the entry point. Also, the system is capable of being repositioned under direct visualization, adjusting the angle of traction for optimal view. It is an excellent and efficient solution for diminishing the invasiveness and increasing the safety. The objective of this present work is to report the first use in patients of this technology in an advanced laparoscopic center.

Materials and Methods: The system is comprised of a grasper with a detachable tip and an external magnetic controller. The grasper is similar in shape and function as a regular laparoscopic grasper, provided with a delivery/retrieval shaft that allows the application/retrieval of the detachable tip. With the detachable grasper tip secured to the organ, the external magnet is placed over the abdominal wall and a magnetic attraction is achieved. The external magnet can then be freely moved providing unconstrained retraction. At the end of the procedure, the detachable grasper tip is reconnected to the grasper shaft and removed from the patient. The objective of this study was to report the clinical performance in the first clinical bariatric cases using the Magnetic Surgical System in an advanced laparoscopic Surgical Center.

Results: The Magnetic Surgical System is cleared for commercialization in Europe (CE Mark) and it is commercially available in Chile for any laparoscopic procedure. The group was composed of a total of 24 patients. In 23 patients a reduced port sleeve

gastrectomy was performed (16 women and 7 men) with an average of 35.8 years old (range 17-62) and BMI average of 33.4 Kg/m² (range 30-38.3). All of the patients had some comorbidities related to obesity. The single case was a 52 years old female with a lap band surgery performed 12 years ago and with indication of removal for a slippage and dysphagia. All 24 procedures were fully performed by a reduced port technique (3 ports; one umbilical and one in each flank). In the case of the sleeve gastrectomy cases, the Magnetic Surgical System was used to make traction of the greater omentum to perform the dissection of the greater curvature and then to mobilize and expose the stomach to securely apply the stapler lines. The device enables an efficient exposure of the stomach for the gastric section and stapling that increase the safety of the procedure. The mean operative time was 98 minutes (range 50-138). In the case of the band retrieval, the Magnetic Surgical System was used to make traction to the adhesion between the band and the liver, efficiently lifting the liver. The procedure took 56 minutes. There were no complications or side effects related to the device in any of the surgeries. In the post-operative, one patient presented abdominal wall bleeding in the right flank incision that was resolved with an external stitch. No other patients presented any other complications.

Conclusions: This study shows that the Magnetic Surgical System is useful in bariatric surgery as it diminishes the number of incisions and enhances exposure. The system reduced invasiveness and increased safety, maximizing the benefits for the patients. Additional clinical evaluations in other minimally invasive surgical procedures should be considered in order to continue to evaluate the system's benefit.

A5097

Endoscopic Intra-gastric Botulinum toxin injection for Obesity leading to total gastrectomy and Roux en Y esophago-jejunostomy

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Background: Endoscopic intra-gastric injection of Botulinum toxin A (EIGBotox) for the treatment of obesity has emerged as a potential treatment modality under investigation. We report the first

case of hemorrhagic gastritis and gastric necrosis following EIGBotox for the treatment of obesity necessitating total gastrectomy and Roux en Y esophago jejunostomy (RYEJ).

Case: A 46-year-old Emirati female with history of Charcot-Marie-Tooth disease (CMT), referred from another medical facility with 2 weeks history of abdominal pain and melena requiring blood transfusion following recent (EIGBotox) for treatment of obesity. Upper GI endoscopy showed extensive sloughing of the gastric mucosa with generalized oozing and severe edema causing gastric outlet obstruction. Initial conservative management was unsuccessful and the patient went into septic shock. Emergency laparotomy revealed complete stomach necrosis with perforation, she had total gastrectomy with subsequent second stage RYEJ.

Discussion: EIGBotox for the treatment of obesity is based on animal studies to produce delayed gastric emptying and early satiety with subsequent weight loss. Most published studies in favor of this modality are limited by several factors: small numbers of patients, selection bias, short follow-up periods, and great variations in the number, dose and location of injections.

Conclusion: This is the first reported case of EIGBotox for the treatment of obesity leading to gastric necrosis, perforation necessitating total gastrectomy and RYEJ. More randomized trials are needed to evaluate the safety and efficacy of EIGBotox.

A5098

Endoluminal Weight Loss Procedures in the New Millennium: Global Trends & Publications

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Introduction: Minimally invasive bariatric endoluminal procedures have been gaining popularity in the past 15 years. We aim to review the literature and look at the new trends in the publications of endoscopic weight-loss procedures.

Methods: A literature review was conducted utilizing SCOPUS, and keywords including 'endoluminal & weight loss', 'intra-gastric balloon', 'Obalon', 'endoluminal suturing', 'air filled balloon', 'adjustable balloon', 'Endobarrier', 'Endoluminal over-stitch Apollo', 'Primary Obesity Surgery Endoluminal (POSE)', 'AspireAssist', 'GI Windows', 'Revisional Obesity Surgery Endoluminal (ROSE)' & 'endoscopy &

weight loss'. Surgical bariatric publications were excluded. Publications on the aforementioned topics from 2000 to the end of 2015 were included.

Original articles and systematic reviews were only included. Original articles and systematic reviews were analyzed according to countries, journals, years, institutions, authors, and sub-specialties.

Results: A total of 669 publications were collected; 75% of them were original articles. The most and least studies were from North America (USA 29%) and Africa, respectively. The top three journals published in were Obesity Surgery (20%), Surgery for Obesity and Related Diseases (5%), and Gastrointestinal Endoscopy (4.5%). 88% of publications were based on medical fields.

Publications on intra-gastric balloon make up 56% of all studies, while publications on other endoluminal procedures for weight loss contribute to 44%, of which the majority was endoluminal suturing at 45%. Regarding intra-gastric balloon publications, 36% of them were on fluid filled, followed by adjustable intra-gastric balloon (10%), air filled (6%), and others including complications and studies combining different types of balloons (48%). Publications on intra-gastric balloon in the new millennium have tripled in number as compared to the year 2000. Most publications on balloons are from Italy (18%), followed by the U.S. (13%), and Spain (8%). Most publications of other endoluminal procedures, by country were from the U.S. (51%), then Germany (22%) and the UK (5%). The overall trend on endoluminal publications is increasing with a sharp increase seen in the last 5 years. Only 8 randomized controlled trials were published; 5 of which were on intra-gastric balloon and the rest on other endoluminal procedures for weight loss.

Conclusion: In the past 15 years, an increasing trend in publications was seen, with a sharp increase seen in the last 5 years. Most of publications were from the USA. We need to conduct more randomized controlled trials. Most of the publications were based on intra-gastric balloon, with fluid filled balloon comprising the majority of them. The other endoluminal methods, especially endo-suturing are recently on the rise.

A5099

INTRAGASTRIC BALLOON TO DECREASE SURGICAL RISK IN THE PREOPERATIVE TIME

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Background: Super obese patient who've a high surgical risk (major complications 30% and mortality 5-12%). The present study evaluates the use of BIB as a preoperative procedure aiming an initial weight loss and reduction of surgical risk.

Methods: From November 2000 to June 2015 (178) super obese patients (mean BMI=60.3 +- 10.1kg/m2) were treated with the BIB for at least four months before surgical treatment: 135 male (BMI= 58.4 +- 8) and 43 female patients (BMI= 62.3 +- 10.7). They showed associated diseases, including systemic arterial hypertension (72), diabetes mellitus (26), sleep apnea (54), hypercholesterolemia (27) and osteoarthritis (43).

Results: Patients showed mean percent excess weight loss (%EWL) of 23.4 +- 11.0%, mean percent total weight loss (%TWL) of 13.6 +- 6.5%, and mean BMI reduction of 8.4 +- 4.9 Kg/m2. Around 80% of patients showed good results with 27% EWL with improvement in hypertension, diabetes mellitus and sleep apnea. Surgical risk was reduced from ASA III-IV to ASA II. All these patients were submitted to bariatric surgery (GB 41%, LAGB 33% or SGBPD 26%). There was no mortality and only minor complications (wound infection 7.5%).

Conclusions: BIB is an effective technique to prepare super obese patients to surgery (79%), reducing their major complications and mortality. Effective non-surgical technique in pre-op time for patients BMI>50. Change surgical risk ASA III -IV to ASA II (79%). No mortality and lower complications. Reduce 79% the indications of two stage surgery. The risk is lower cost than two stage surgery.

A5100

OUTCOMES OF SELECTIVE PREOPERATIVE ENDOSCOPY IN PERSONS WITH OBESITY

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Introduction: Obese individuals have a higher incidence of gastrointestinal and hepatic diseases, including gastroesophageal reflux disease (GERD), gastritis, esophageal and gastric neoplasms. Proponents of routine pre-operative endoscopy for bariatric surgery cite a high incidence of esophageal and gastric pathology as justification for routine

screening. Few studies have reported the outcomes of selective endoscopic screening based on the patient history and symptomatology. We sought to identify the prevalence of foregut pathology discovered during selective endoscopic screening prior to bariatric surgery.

Methods: We examined the 100 most recent consecutive patients who underwent preoperative endoscopy in preparation for bariatric surgery. Patients were selected for pre-operative esophagogastroduodenoscopy (EGD) if they had a history of non-steroidal anti-inflammatory drug (NSAID) use, chronic GERD, or other foregut symptoms (e.g. dysphagia). Patients also underwent EGD if they had any previous gastric surgery, including primary or revisional bariatric procedures. Demographics, comorbidities, endoscopic findings, and any post-procedure medical or surgical interventions were collected for primary outcome analysis. Date of initial visit and time interval to EGD or bariatric procedure was collected for secondary outcome analysis.

Results: From January 2015 to April 2016, 100 consecutive patients met the selective inclusion criteria and underwent preoperative upper endoscopy. The indications for preoperative endoscopy were GERD (n=49), NSAIDs (n=31), GERD with NSAIDs (n=13), and previous bariatric surgery (n=7). Endoscopic abnormalities were identified in 47% of patients with GERD, 37% of patients who used NSAIDs, 62% of patients with GERD with NSAIDs, and 57% of patients with prior gastric surgery. Overall, 38% of patients required additional medical or surgical intervention based on findings at endoscopy. The most common intervention was initiating or increasing the dose of proton pump inhibitors prior to surgery (26%). The operative plan was changed to include hiatal hernia repair in 12% of patients. Average time from initial visit to EGD was 55.8 days. Average time from EGD to surgical procedure was 58.41 days.

Conclusion: Preoperative upper endoscopy is a valuable screening modality in preparation for bariatric surgery. In our study, selective preoperative EGD had a high rate of pathologic findings necessitating intervention or change in operative planning. The highest rate of pathology was found in patients with GERD and simultaneous NSAID use. Additional studies are needed to better delineate whether selective screening is sufficient to adequately identify bariatric surgery candidates with foregut pathology.

A5101

Psycho-social Support and Outcomes in Weight Loss Surgery

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Background: Successful outcomes in bariatric surgery (Excess body weight; EBW > 50%) have been described to linked with adequate psycho-social patient support.

Hypothesis: Different types of psycho-social support following Laparoscopic Vertical Sleeve Gastrectomy (LVSG) would have an impact on weight loss success and nutrient deficiency occurrences.

Methods: This study included 931 consecutive patients who underwent LVSG at a university-affiliated teaching hospital from January 1st, 2011 to December 31st, 2014 by 5 different surgeons. 431 out of 931 had one-year complete follow up information and were selected for retrospective analysis. Patients were assigned groups based on their support system: Support group attendance group (group A), defined by attending support group for a minimum of 2 visits within 1 year of having LVSG; Shared residence group (group B), defined as members within the same household who also underwent LVSG in the same 4 year period as determined by common home addresses; Support and shared residence group (group C), defined as both support group attendance and common addresses; No support group (group D), as indicated by neither support group attendance nor having common addresses. Data points included the mean excess body weight percentage loss (EBWL), mean weight loss (WL), vitamin B12, folate, and iron deficiency for each of the study groups. All groups, separately and together were compared to group D. **Results:** 931 patients were identified as having LVSG with 431 46% having a one-year follow up. 72 (17%) of the 431 patients attended support group (group A). 19 (4%) of 431 patients shared common addresses (group B). 6 (1%) of the 431 patients met the criteria for support group attendance and common home address (group C). A total of 346 (80%) patients did not attend support groups or have common addresses (group D). The mean WL for groups A, B, C and D was 81 (+8.58), 79.7 (+15.2), 103 (+42.1), and 76.3 (+2.92) respectively. The mean EBWL for groups A, B, C, and D was 54.4 (+4.18), 57.2 (+10.66), 64.3 (+17.28), and 53.3 (+

1.76) respectively. There was no statistical difference between group A and group D for EBWL (p=0.8) or WL (p=0.83), between groups B and D for EWBL (p=0.53) or WL (p=0.75), or between groups C and D for EBWL (p=0.83) or WL (p=0.80). There were no post-operative deficiencies in any of the groups with respect to vitamin B12 or folate. Four patients from group A were found to be iron deficient post-operatively.

Conclusions: We found no statistical difference in weight loss and in nutritional deficiencies in between the groups; however, there was a tendency towards more weight in patients who lived in the same household and attended support groups. Larger patient population would be required to adequately compare the social support factors that influence outcomes in bariatric surgery.

A5102

Maladaptive Hypothyroidism, or The Famine Response, After Bariatric Surgery: TSH not the Gold Standard For Detection

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Introduction: Though bariatric surgery is the most effective treatment for severe obesity, at least 30% experience unsuccessful weight loss or weight regain. One potential reason may be undetected hypothyroidism due to rapid weight loss, which is part of the 'famine response.' TSH, normally the gold standard for diagnosing hypothyroidism, may not be an adequate measure of this type of hypothyroidism. Instead, a ratio of the Free T3 pg/mL (FT3) to reverse T3 ng/dL (rT3) is used. The prevalence of the famine response using this ratio has not been evaluated in post-bariatric patients, although symptoms commonly described early after bariatric surgery (e.g., feeling cold, tired, constipated, hair loss, dry skin, mood changes) are classic symptoms of hypothyroidism. This study's aim, using hormonal and clinical symptoms, is to serve as a first step in research examining the influence of hypothyroidism and the famine response on weight loss outcomes. An important initial question is whether a subset of post-bariatric patients meet criteria for hypothyroidism during the period of rapid weight loss after surgery.

Methods: Thyroid hormone levels (TSH, FT4, FT3, rT3) were measured in bariatric patients (n=22) at pre-op (about 2 weeks prior to surgery), 2 weeks post-op, and 3 months post-op. Hypothyroidism was defined as FT3:rT3 < .18. Patient self-reported hypothyroid symptoms were also collected at these time points.

Results: Participants were 95.5% female, 43.96 ± 16.14 years old, with a mean BMI at surgery of 45.48 ± 7.80 kg/m². Half received gastric-bypass and half gastric sleeve. At baseline, 59% (13/22) met criteria for hypothyroidism, 90.1% (20/22) met criteria between 2 weeks to 3 months post-op. Paired sample t-tests from pre- to post-op revealed significant decreases in weight, FT3, FT3:rT3 ratio, as well as significant increases in total number of hypothyroid symptoms, FT4, and rT3 (all p < 0.05). No significant differences were observed for changes in TSH. After surgery, 54.5% (12/22) of patients experienced an increase in hypothyroid symptoms and 86.4% (19/22) exhibited a decrease in the FT3:rT3 ratio, despite normal FT3, rT3, and TSH levels.

Conclusion: These results support the presence of hypothyroidism in high numbers of post-bariatric patients. Mandatory weight loss may be responsible for the high percentage of hypothyroidism in this sample prior to surgery. However, patients with hypothyroidism still significantly increased from pre to post surgery, as did the number of reported hypothyroid symptoms, whereas no significant changes in TSH were observed over the same time period. Such findings indicate that TSH is a less sensitive marker of hypothyroidism compared to the FT3:rT3 ratio. Future studies should obtain thyroid tests earlier in the surgical evaluation process, before any weight loss has occurred, to establish a euthyroid baseline. Future studies should also test whether the presence of hypothyroidism after surgery influences later unsuccessful weight loss or weight regain.

A5103

Prevalence of Psychiatric Disorders in Hospitalized Patients After Bariatric Surgery Using a National Database

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Background: Obesity and psychiatric disorders are complexly linked comorbid conditions. A high prevalence of psychiatric disorders exists in patients with obesity, particularly mood disorders including depression and anxiety. Bariatric surgery is historically associated with improvement of psychiatric conditions. However, persistent psychiatric disorders may be linked to increased risks of other diseases and higher utilization of health care resources. The purpose of this study is to examine prevalence of psychiatric disorders among hospitalized patients who have a history of bariatric surgery.

Methods: The National Inpatient Sample (NIS) is the largest in-patient database in the USA, containing information from approximately 8 million hospital discharges per year. Using data from the NIS database from 2010 to 2013, we identified 986,120 discharges with patients who have a diagnosis of history of bariatric surgery. A prevalence of psychiatric disorders among the patients was examined and compared with patients with obesity and with all patients from the NIS database. Patients with depression and bipolar disorder were examined and compared to the patients without mood disorder.

Results: The prevalence of any mood disorder in patients who have a history of bariatric surgery was significantly higher compared to those with obesity (34.4% vs 21.3; p < 0.001), with depression being the most common mood disorder (22.7% vs 14.1%; p < 0.001). The bariatric group had also higher prevalence of anxiety disorder (15.0% vs 10.2%; p < 0.001), alcohol related disorder (6.8% vs 3.2%; p < 0.001), and substance related disorder (6.1% vs 4.0%; p < 0.001). The prevalence of these psychiatric disorders were also higher compared with all patients from the NIS database (Table 1). Compared to patients with obesity, bariatric patients had a higher rate of hospitalizations with mood disorder as a primary diagnosis (3.7% vs 2.3%; p < 0.001). Suicide attempt and ideation were also more prevalent in the bariatric group than the other groups. Among the bariatric patients, those with depression or bipolar disorder were younger than those without any mood disorder (51.7 y vs. 51.5 y vs. 45.9 y; p < 0.001) and more likely to be female (77% vs 85% vs 88%) (Table 2). They also are more likely to have more chronic conditions (4.4 vs 6.3 vs

5.9; $p < 0.001$) and increased length of stay (4.0 day vs 4.5 day vs 5.7 day; $p < 0.001$). Total hospital charges were lower in the patients with depression or bipolar disorder (\$41143.36 vs \$37685.18 vs \$28160.13; $p < 0.001$). High prevalence of anxiety, alcohol, and substances related disorders were observed in the bipolar group.

Conclusion: Psychiatric disorders were frequently observed in hospitalized bariatric patients. Particularly, an increased prevalence of mood disorders among the hospitalized bariatric patients suggests that bariatric patients with a comorbid mood disorder are more likely to be hospitalized. Given the current literature showing decreased rates of mood disorders after bariatric surgery, further study on identifying patients who will have persistent mood disorder following bariatric surgery is warranted.

A5104

Preoperative Transthoracic Echocardiography in Patients with Super Obesity for Bariatric Surgery: Is it necessary?

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Introduction: Cardiac abnormalities are not uncommon in asymptomatic morbidly obese patients and can influence operative and postoperative care in those particular patients. Bariatric surgery although a very beneficial surgery to treat obesity, like any other surgery, has its operative risks and postoperative complications, particularly in those who are morbidly obese. In Amiri Hospital Kuwait, all patients with a BMI of 50 and above are referred for preoperative echocardiography (ECHO). There are no clear guidelines for screening patients with super obesity. Our study aims to identify asymptomatic morbidly obese patients with cardiovascular abnormalities prior to surgery and whether those cardiac abnormalities influence bariatric surgery.

Methods: A retrospective study collected data between 2012 and 2016 on 1187 patients post-sleeve gastrectomy (LSG), of those 112 patients with BMI of 50 kg/m² and above were selected. Demographic data, BMI, percentage of excess weight loss and echocardiographic findings were collected and analyzed over 18 months follow-up.

Results: A total of 112 patients out of the 1187 patients who underwent bariatric surgery had an

ECHO report, of which 74.5% had a BMI of >50. The mean age is 36.79 +/- 13 and 73 (66%) were female. The Mean BMI of patients was 54.5-kg/m² +/- 9.9 SD. Analysis showed that the majority of patients (81%) were younger than fifty years of age. The majority of patients (70%) were found to have a normal ECHO report. Almost all patients (95%) were found to have a normal Ejection fraction of >55%. The most common abnormalities found on the ECHO report were mild diastolic dysfunction (17%), mild atrial or ventricular enlargement (6%) and mild valvular abnormalities (5%). No morbidities or mortalities were observed postoperatively.

Conclusion: Preoperative transthoracic echocardiography has revealed a wide range of cardiac findings in super obese patients. No cardiac complications were observed among the patients postoperatively. We recommend a selective approach for indicated super obese patients. Larger studies and cost-benefit analysis are needed to validate our results.

A5105

Impact of adjuvant pharmacotherapy on weight loss outcomes after bariatric surgery

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Background: Bariatric surgery has been proven as effective treatment for obesity and metabolic disease. However, there are patients who do not achieve optimal weight loss or regain weight after bariatric procedures. In this study we aim to determine the effectiveness of adjuvant medical weight loss medications after surgery for this group of patients.

Method: After IRB approval, patients who received weight loss medications after bariatric surgery from 2012 to 2015 were identified at a single academic center. Data collected included baseline characteristics, co-morbidities, perioperative parameters, postoperative outcomes, types of medication given and outcomes at one year after initiating pharmacotherapy.

Results: Eighty three patients received weight loss medication after primary bariatric procedures: Roux-en-Y gastric bypass (n=56), sleeve gastrectomy

(n=22), adjustable gastric band (n=3), gastric plication (n=1) and duodenal switch (n=1). Median age was 52 years (IQR 45-58) and 93% were female. Preoperative comorbidities before starting medication included obstructive sleep apnea (n=34, 41%), hypertension (n=32, 39%), hyperlipidemia (n=22, 27%), type-2 diabetes (n=18, 22%), chronic obstructive pulmonary disease (n=2, 2%), coronary artery disease (n=1, 1%), peripheral artery disease (n=1, 1%), depression (n=23, 28%) and anxiety (n=7, 8%). Preoperative median weight and BMI were 129kg (IQR 107-143) and 46 kg/m² (IQR 42-52) respectively. The median nadir weight and BMI after bariatric procedures were 88 kg (IQR 77- 101) and 33kg/m² (IQR 29-37). Median duration for reaching nadir weight was 11 months after bariatric procedures. The time interval between surgery and initiating pharmacotherapy was 28 months (IQR 21 - 51). The most common adjuvant weight loss medications used were Phentermine (51%), Qsymia (15%) and Lorcaserin (8%). The median weight and BMI at the time of starting pharmacotherapy after surgery were 100 kg (IQR 87- 118) and 37kg/m² (32-42) respectively. These patients were followed at 3 months (85.5% at follow up) and 12 months (67.5% at follow up). A mean BMI change of -1 kg/m² at 3 months and - 0.5 kg/m² at 12 months was observed with using adjuvant weight loss medications. Overall, 27% had total weight loss >5% at 12 months.

Conclusion: Our experience utilizing adjuvant pharmacotherapy for weight loss after bariatric surgery is early in its development. Our study showed that adjuvant pharmacotherapy halted weight gain in patients who predominantly underwent gastric bypass and sleeve gastrectomy. Further study is needed to refine the medication protocols and define the optimal time to start medication and dosages in this challenging patient population. Key words: Bariatric surgery, weight loss, regain, sleeve gastrectomy, bypass, pharmacotherapy

A5106

Weight loss following bariatric surgery in women with polycystic ovarian syndrome and oligomenorrhea

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Background: Though the pathogenesis of polycystic ovarian syndrome (PCOS) is incompletely understood, it has been linked to obesity, metabolic syndrome and insulin resistance. The NIH suggests that patients with two of the following: oligo/anovulation, hyperandrogenism and polycystic ovaries on ultrasound, meet the Rotterdam criteria for diagnosis of PCOS.¹ The incidence of PCOS is 8% in the general female population and is suspected to be much higher in individuals with obesity as the majority of these patients are undiagnosed. Though not sufficient for diagnosis, oligo/amenorrhea is an important component of the condition and PCOS should be suspected in these patients as the majority of PCOS patients first present with oligomenorrhea. Bariatric surgery has been shown to correct menstrual irregularity and androgen levels in these individuals, but there exists a dearth of literature examining weight loss in women with PCOS compared to those without this diagnosis.

Objectives: The objective of this study is to determine whether a difference exists in weight loss following bariatric surgery in patients with PCOS, in patients with menstrual irregularity alone and in patients with no reported menstrual irregularity.

Setting: University Hospital

Method: Our institutional database was queried for premenopausal women <50 years old who had bariatric surgery between 01/2012-04/2015. Information regarding type of surgery was obtained for each patient. These patients were divided into those who self-reported PCOS, those who reported menstrual irregularity and those who reported neither. Preoperative weight and height were collected and BMI was calculated. Weights were measured at time periods: 30 days (20-40 days were accepted), 90 days (60-120 were accepted), 180 days (121-240 days were accepted), 360 days (270-450 days were accepted) and 720 days (630-810 days were accepted) following surgery. Percent weight loss, change in BMI and percent excess BMI lost was calculated for each of these time periods and the means for each group were obtained. Analysis of variance (ANOVA) was run and p-values were obtained for each time period.

Results: 119 patients with PCOS (7.48%), 278 with menstrual irregularity (17.5%) and 1193 with neither (75.0%) underwent bariatric surgery during the time period. Of these, approximately 10% underwent gastric band, 66% underwent sleeve gastrectomy and 24% underwent Roux-en-Y gastric bypass. Starting BMI was 42.83/41.73/42.33 for these groups, respectively (p=.25). Table 1 shows the mean

change in BMI, percentage weight loss and change in excess BMI for each group at 30/90/180/360/720 days following surgery. The p values were obtained and are all found to be $>>.05$ indicating no statistically significant difference between the three groups.

Conclusions: There was no difference in weight loss between patients with a diagnosis of PCOS, those with menstrual irregularity, and those without menstrual irregularity in the 2 years following bariatric surgery. Given that patients with PCOS are at higher risk of obesity related complications such as type 2 diabetes and dyslipidemia than those without PCOS, this is an encouraging result as it illustrates the efficacy of bariatric surgery for weight loss in the PCOS cohort. We look forward to further research to clarify the true incidence of PCOS in individuals with obesity as the high incidence of menstrual irregularity in our population leads us to suspect a substantially higher incidence of PCOS than is diagnosed. - Rotterdam EA-SPCWG. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. Fertility and sterility. Jan 2004;81(1):19-25. "

A5107

Self-reported taste changes and food/physical activity preferences correlate with successful weight loss in females who underwent bariatric surgery

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Background: Taste and sensory factors drive food choice. However, little is understood about the taste and flavor function of those who have undergone bariatric surgery, especially those who are successful versus less successful in weight loss at one-year post-procedure.

Aim: We aimed to compare self-reported and measured taste and olfactory flavor function between females with morbid obesity before bariatric surgery (controls) with an independent group of females 1-year post-surgery (cases). Additionally, we investigated sweet preference as well as dietary quality and physical activity behaviors between controls and cases. We hypothesized that those more successful with weight loss post-surgery

would have greater taste and flavor functioning, report lower sweet preference, and report greater liking for foods and activities that associate with energy deficit/balance.

Methods: In a case-control design within a convenience sample, we evaluated 49 females with morbid obesity pre-surgery (Pre-Op) and 38 female patients 1-year post-surgery (Post-Op), who underwent either gastric bypass (n=13) or sleeve gastrectomy (n=25). The Post-Op group was recruited from the highest (n=23) and lowest (n=15) tertiles of 1-year excess weight loss in our practice. The patients self-reported smell and taste function similar to the National Health and Nutrition Examination (NHANES) protocol. All patients self-reported the intensities of concentrated quinine and NaCl, applied to the tongue tip and sampled with the whole mouth (NHANES protocol), as well as propylthiouracil (PROP; probe for genetic variation in taste), sampled with the whole mouth. As a screening for retronasal olfaction, sweet intensity and liking, patients reported the sweetness, flavor (nose plugged/unplugged), and liking of four jellybeans (cherry, coffee, chocolate and tabasco as an irritant probe). Finally, subjects completed a validated, 100-item liking survey comprised of foods/beverages, physical/ sedentary activities, and general pleasurable/unpleasurable experiences. The survey items were formed into 16 groups (averaging the scores across the items). Nutritional groups included alcohol, desserts, fruits, vegetables, protein, sugar-sweetened beverages, fats, carbohydrates, fiber, and salty. Sensory groups included bitter, spicy, and sour. The nutritional groups were formed into an index of dietary quality similar to the USDA Healthy Eating Index, and then joined with the physical and sedentary activities to form a healthy behavior index. Data were analyzed for central tendency with analysis of covariance and differences in distribution with non-parametric statistics. Significance criterion was $p \leq 0.05$.

Results: Alterations in smell or taste function were reported by about 1 in 5 Pre-Ops, a rate similar to participants with obesity in the 2011-2012 NHANES survey. Among all Post-Ops, 25% reported smell and 33% taste alterations since surgery, which did not vary by weight loss success. Interestingly, those who were successful vs. unsuccessful more frequently reported that 'some things did not taste right' (44% vs 13%, respectively). From measured taste, Post-Op vs. Pre-Op patients trended toward lower salt and bitter taste function on the tongue tip, but did not differ in taste intensity as measured by sampling

with the whole mouth. There were no differences in the reported bitterness of PROP between any patient groups. Furthermore, no patient groups varied significantly in jellybean sweetness or retronasal olfactory flavor. Preference for sweet tended to be lower among those who were more successful in surgery versus Pre-op for the jellybean test ($p=0.07$), and was statistically significant for reported liking of sugary beverages. Successful Post-ops also reported significantly higher dietary quality compared to Pre-ops; those less successful with the surgery were not statistically different from the Pre-ops. In the Health Behavior Index, considering diet quality and physical/sedentary activities, those successful in weight loss reported significantly more healthy behaviors than both the Pre-Op and the less successful Post-Op groups.

Summary: These preliminary findings do not support changes in smell and taste function after surgery. . The exception is that those who were successful in weight loss reported alteration in taste, and possibly dysgeusia. Further evaluation is needed to determine if the alteration is something tasted in the mouth (e.g., acid reflux), or either a phantom taste or oral sensation. What was more evident were potential shifts in dietary preferences including diminished sweet preference, by orally sampled candy or by survey, especially in those who were most successful in bariatric surgery. Simple surveying of food and activity likes and dislikes was sufficient to detect differences in preferences between Pre-op and less versus more successful with weight loss. Similar to our previous findings, now with a larger dataset, we continue to find that those who are successful with weight loss post-surgery reported the highest diet quality and liking for physical versus sedentary activities.

A5108

Marijuana use and outcomes in the bariatric population

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Background: In 2012, Colorado Amendment 64 legalized limited cultivation, possession, and use of cannabis for adults over the age of 21. The use of marijuana (MJ) along with the standardized process

of bariatric surgery creates an opportunity to study the clinical effects of this substance. Due to the traditional belief that MJ use increases appetite, we hypothesized that weight loss would be less at 3 months in the MJ users.

Methods: Data was collected for consecutive patients undergoing bariatric surgery at a single institution from 5/2014 to 7/2015. All surgical patients were questioned about MJ use during preoperative visits. Chart review was used to obtain demographics, medication use, perioperative narcotic use, and co-morbidities. The primary outcome was weight loss at 90 days. Continuous demographic variables were compared using Student's ttests, while categorical data were compared using Pearson chi-square tests between the two groups (MJ and Non-MJ). Continuous outcome variables were modelled using linear regression and count outcome variables with Poisson regression.

Results: 434 patients were included. 36 (8.3%) were regular MJ users. MJ users tended to be younger ($P=0.003$) and had fewer co-morbidities ($P=0.003$). Weight loss at 3 months averaging 18 pounds, was not significantly different from non-users ($P=0.89$). Clinical outcomes including readmissions and ED visits demonstrated no differences. Perioperative narcotic requirement was significantly higher in the MJ users (natural log of morphine equivalents 3.92 v 3.52, $p=0.0015$) despite a trend for lower subjective pain scores (3.7 v 4.2, $P=0.07$). History of tobacco use was also higher in marijuana users but this did not reach significance (55 v 38%, $P=0.064$).

Conclusions: MJ use did not have a measurable effect on short-term outcomes of bariatric procedures. There is a measured difference in perioperative narcotic use that needs to be further explored, although the cause of this phenomenon is yet unknown. Further investigation is necessary to stratify MJ use by route and dose, and to evaluate the impact of MJ use on long-term outcomes of bariatric surgery.

A5109

BARIATRIC SURGERY OUTCOMES IN OLDER PATIENTS: IS IT SAFE AND EFFECTIVE IN THIS PATIENT POPULATION?

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Background: Current projections indicate that the percentage of the population over the age of 65 will continue to increase. Morbid obesity rates are increasing rapidly in all age groups, especially in the older population. Weight loss surgery is a viable option for sustained weight loss, yet older patients remain in the minority receiving surgical treatment. We sought to identify the safety and efficacy of weight loss surgery in our morbidly obese patients <u></u> 65 years of age. &Irm;

Method: We performed a retrospective review of bariatric surgery patients 65 years and older from January 2012 to December 2015. All patients in this subgroup underwent our protocol based standard preoperative medical workup, nutritional education and postoperative management. In addition as per our protocol this subgroup of patients was further screened with a preoperative cardiac risk assessment by either their Primary care physician and/or Cardiologist.

Results: Out of 2540 primary bariatric surgeries performed during the study period, 131 (5.1%) patients were <u></u> 65 years of age (mean age 68.08 +/- 2.29). Mean BMI was 45.19 +/- 6.6 with 90 (68.7%) females. Comorbidities in patients included Hypertension (91.6%), Diabetes mellitus (64.1%), Obstructive Sleep Apnea (69.4%), Gastroesophageal reflux (50.3%) and Coronary artery disease (26.7%). All surgeries were performed using laparoscopic approach. Surgeries included 74 sleeve gastrectomy (56.4%), 54 gastric bypasses (41.2%), 2 gastric band placements (1.5%) and 1 duodenal switch (0.7%). Mean operating time was 115 minutes. Average Length of stay was 2.25 days. Nine patients (6.8%) had a complication including 5 bleeding, 1 NSTEMI, 1 port-site hernia, 1 c-diff colitis and 1 TIA. Two patients (1.5%) required a reoperation. No mortality occurred in this age group. On average patients achieved an Excess Weight Loss (EWL) of 29.56% at 3 months, 42.66% at 6 months, 50.59% at 1 year and 54.96% at 2 years. Median follow-up was 401 days. Complete diabetes mellitus resolution was noted in 38 (45.2%) out of 84 patients.

Conclusion: Our study supports previously reported retrospective data that in appropriately selected older patients, bariatric surgery can be performed both safely and effectively. Thus older patients can obtain the benefits of weight loss, resolution of comorbidities and over-all improved quality of life from bariatric surgery.

A5110

Does local wound infiltration with liposomal bupivacaine (Exparel®) reduce narcotic requirements or length-of-stay after bariatric operations?

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Introduction: Liposomal bupivacaine (LB) is FDA approved for ankle block and local infiltration after hemorrhoid surgery. It has found widespread use in local infiltration in orthopedic and general surgery. Our institution started using it approximately 1 year ago. The purpose of this study was to compare the narcotic use and length-of-stay (LOS) after bariatric surgery before (control group) and after the introduction of LB into our clinical practice (study group). The hypothesis is that the use of LB reduces narcotic requirements and length of stay compared to no infiltration.

Methods: The data was collected as part of a prospective randomized trial investigating residual weakness after bariatric surgery (clinicaltrials.gov NCT02037516) from 01/01/2014 to 01/31/2016. Starting on 03/01/2015 LB infiltration was used. Data was analyzed using standard statistical tests to determine the comparability of both groups, LOS and opioid consumption. Pain scores after PACU discharge were not analyzed due to the bias towards the inferior group. (Pain scores are recorded once per shift and when a patient requires pain medication.) Secondary outcomes will be the analysis of antiemetic rescue medication. Narcotic-free total intravenous anesthesia (Propofol, ketamine, dexmedetomidine) was used intraoperatively and multimodal analgesia in the postoperative period using acetaminophen and ketorolac.

Results: Data from 325 patients (211 control and 114 study) were analyzed. There was no difference in baseline characteristics: Age, BMI, morbidity/mortality score, surgical time and procedure. The study group required less opioids in PACU (4.0mg +/-0.80 vs 6.8mg +/-0.78) and on the first postoperative day (6.6mg +/-1.36 vs 11.3mg +/-1.97). On the day of surgery after discharge from PACU there was no difference in opioid consumption. The median LOS was shorter in the study group (1day[1,1] vs 2 days [2,2]). Patients in the study group had significantly lower pain scores on admission to PACU than in the control group (0[0,0] vs 0[0,5]). There was no difference in PACU PONV

scores or the total number of antiemetic rescue medication (AERM) used.

Conclusion: Wound infiltration with LB was able to reduce narcotic consumption, pain scores and LOS by a median of 1 day. There was no difference in PONV scores or AERM used.

A5111

Sleeve Gastrectomy and Roux-en-Y Gastric Bypass Lead to Comparable Changes in Body Composition in an Asian Population

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Background: Weight loss after bariatric surgery should be targeted towards reduction of body fat with maximum preservation of fat free mass to prevent a negative impact on the metabolic and physical capacities of patients. Changes in body composition after bariatric surgery such as a sustained loss of body fat are often associated with an inevitable loss of fat free mass. This can contribute to an undesirable disturbance in resting metabolic rate and weight maintenance.

Methods: Our aim was to study changes in body composition in Asian patients following bariatric surgery and to identify differences between laparoscopic sleeve gastrectomy and laparoscopic roux-en-Y gastric bypass. A retrospective review of prospectively collected data on 285 patients who underwent either laparoscopic sleeve gastrectomy (247 patients) and laparoscopic roux-en-Y gastric bypass (38 patients) was performed. Body composition variables were measured with the analyzer, GAIA 359 PLUS, which included the parameters; total body weight, body mass index, excess weight, basal metabolic rate, fat-free mass, fat mass and total body water. Patient characteristics and demographics were also analysed. Wilcoxon Sign Rank test was performed to comparing body composition changes between laparoscopic sleeve gastrectomy and laparoscopy Roux-en-Y gastric bypass.

Results: The median pre-operative body mass index, excess weight and total weight were 41kg/m², 48kg and 113kg respectively. Excess weight loss at 12, 24 and 36 months were 65%, 65% and 57% respectively. Basal metabolic rate at pre-operation,

12 months, 24 months and 36 months was 1503kcal/day, 1444 kcal/day, 1477 kcal/day and 1486kcal/day respectively. Fat mass at pre-operation, 12 months, 24 months and 36 months was 46kg, 26kg, 29kg and 29kg respectively. Fat percentage at pre-operation, 12 months, 24 months and 36 months was 42%, 33%, 32% and 32% respectively. Fat free mass at pre-operation, 12 months, 24 months and 36 months was 64kg, 50kg, 49kg and 56kg respectively. Total body water at pre-operation, 12 months, 24 months and 36 months was 47kg, 36kg, 36kg and 41kg respectively. When comparing patients who had undergone laparoscopic sleeve gastrectomy compared to laparoscopy Roux-en-Y gastric bypass, there were no statistical differences in gender, ethnicity, smoking, alcohol consumption, age, height and post-operative complications. Patients who had undergone sleeve gastrectomy had higher pre-operative body mass index, total weight and excess weight compared to patients who underwent gastric bypass. At 12, 24 and 36 months post-operation, there was no significant differences in excess weight loss, basal metabolic rate, fat mass, fat percentage and total body water. There was significant difference ($p < 0.05$) in fat free mass only at 3 years post-operation, with sleeve gastrectomy patients having a decrease in median fat free mass of 12.5kg compared to bypass patients who gained 3.6kg of fat free mass. However, using the generalized estimating equations approach, we found no statistical significance after adjusting for age, gender, ethnicity, diabetic status and body mass index.

Conclusion: The effects of bariatric surgery in our cohort of Asian patients show that the effects of bariatric surgery on body composition plateaus after 12 months. Sleeve gastrectomy and gastric bypass seemed to give mostly similar changes to body composition despite their differences in mechanisms of weight loss and metabolic effects. There is a need for further research into the mechanisms of sarcopenia following bariatric surgery.

A5112

Sociodemographic Factors Associated with the Likelihood of Undergoing Bariatric Surgery in the United States

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Background: Bariatric surgery is largely considered the most cost-effective treatment modality for morbid obesity and is associated with an improved quality of life. Despite this, the proportion of eligible patients undergoing bariatric surgery in the United States (US) remains low. The objective of this study was to identify patient sociodemographic factors associated with the likelihood of undergoing bariatric surgery.

Methods: The Premier Perspective Database, which consists of data from 458 hospitals nationwide, was used to identify all adult patients eligible for bariatric surgery (i.e., BMI ≥ 40 or BMI ≥ 35 and ≥ 1 obesity-related comorbidity) between 2011 and 2014. Multivariate logistic regressions were performed to determine any relevant patient factors associated with a likelihood of undergoing bariatric surgery.

Results: Based on the Premier Perspective Database, a total of 1,209,209 patients were eligible for bariatric surgery and were included in the study. From these, 6.4% (77,390) actually underwent a bariatric procedure. A higher proportion of eligible patients in the Northeast (11.2%) underwent surgery than in the Midwest (5.7%), South (5.5%), or West (5.3%). Female patients, as well as those who were married, Caucasian, and under 50 years of age were more likely to undergo surgery; patients insured by Medicaid or Medicare were less likely; these patterns were consistent across all 4 regions.

Conclusions: Patients with obesity eligible for bariatric surgery are more likely to undergo surgery if they are younger (< 50 years), female, married, Caucasian, and/or are insured by commercial or managed care. Although the proportion of eligible patients undergoing bariatric surgery varies across regions, the factors associated with undergoing a bariatric procedure are similar across regions.

A5113

Psychological Comorbidities among Bariatric Surgery Patients with Multiple Sclerosis

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Background: Multiple Sclerosis (MS) is associated with high rates of obesity. Preliminary evidence indicates that bariatric surgery may be a safe and

effective option for individuals with both morbid obesity and MS to achieve weight loss and regain functioning. However, individuals with MS and individuals seeking bariatric surgery present with increased rates of depression and compulsive behaviors, which have the potential to adversely impact postoperative weight loss and mental health outcomes. Despite these associations, no research has examined the prevalence of depressive or compulsive disorders in individuals with MS who undergo bariatric surgery. As such, the current study aims to gain a better understanding of relevant psychological comorbidities in obese individuals with MS seeking bariatric surgery.

Methods: Thirty four individuals with morbid obesity and MS who underwent bariatric surgery at our site were compared to a randomly selected control group of 34 bariatric surgery patients without MS. The two groups did not differ significantly on age (M=46), gender (89% female), BMI (M= 50 kg/m²) or race (63% Caucasian). Groups were compared on binge eating (as measured by the Binge Eating Scale), depressive and substance use disorder diagnoses, and behavioral disinhibition. Depression, substance use, and behavioral disinhibition were determined via diagnostic interview and subscales from the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2RF). Between group comparisons were made using independent samples t -tests and chi-square analyses.

Results: Preliminary results revealed that individuals without MS demonstrated higher scores on the MMPI-2RF substance abuse subscale ($t = -2.7$; $p < .01$) and behavioral disinhibition subscale on a trend level ($t = -1.7$; $p < .09$). No other significant differences were found; however, current analyses were limited by missing data and therefore underpowered. Data extraction is ongoing and missing data will be obtained by October of 2016.

Conclusion: Preliminary evidence suggests that individuals with MS who undergo bariatric surgery may demonstrate decreased preoperative compulsive behaviors when compared to their non-MS counterparts, which is a novel finding and has relevance for the treatment of obesity in MS. Additional anticipated results will provide important information on depressive, substance use, and binge eating disorders in this understudied population.

A5114

Pharmaceutical Weight Loss as Adjuvant Therapy for Bariatric Surgery

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Background: Studies have shown promising outcomes with recently FDA-approved medications for weight loss including naltrexone/bupropion (Contrave), phentermine/topiramate (Qsymia), liraglutide [rDNA origin] injection (Saxenda), and phentermine. In this study we analyze weight loss outcomes induced by these medications to characterize their utility in the bariatric clinical setting.

Methods: This retrospective study consisted of 353 subjects who underwent medical weight loss at a single academic institution 2015. Subjects were divided into two study cohorts: (A) those who underwent medical weight loss following bariatric surgery and (B) those who were prescribed medications alone as part of a medical weight loss program. The second cohort was further categorized into a subgroup that underwent bariatric surgery following their initial medication start date. Medication type, length of treatment, and surgery status were obtained. Weight, body mass index (BMI), and percentage of excess weight loss (%EWL) were collected prior to medication start, at 2 weeks, and monthly thereafter.

Results: 74.4% of the overall study population was prescribed Contrave, 13.8% Qsymia, 2.5% Saxenda, 0.9% phentermine, and 8.5% took some combination of the aforementioned medications. 195 subjects were prescribed medication following bariatric surgery. Cohort (A) average time between surgery and medication start date was 39.2 \pm 2.4 months. Subjects were on medication for 9.0 \pm 0.4 months; 19.4% had discontinued medication use at time of analysis. Preoperative BMI for this cohort was 39.2 \pm 0.6 kg/m² and mean %EWL was as follows: 3.1% at 2 weeks, 6.0% at 1 month, 7.6% at 3 months, and 10.7% at 6 months. Cohort (B) had 158 subjects prescribed medication alone. Subjects in this cohort were on medication for 6.5 \pm 0.4 months. Initial Consult BMI was 46.5 \pm 1.1 kg/m², and mean %EWL was as follows: 4.8% at 2 weeks, 7.3% at 1 month, 11.2% at 3 months, and 19.6% at 6 months. Of this cohort, 18.4% underwent bariatric

surgery after their initial medication start date. Average time between medication start date and bariatric surgery for this subgroup was 5.3 \pm 0.9 months. There were no significant adverse events associated with medications.

Conclusion: This retrospective study finds substantial reductions in weight for subjects on prescription weight-loss medications prior to surgery and as adjuvant therapy to maintain weight loss over time. In addition, many medical weight loss patients converted to surgical therapy. Preoperative use of medications appears to have an enhanced effect in comparison to postoperative use. Adjuvant pharmaceutical therapy can be safely and effectively combined with bariatric surgery.

A5115

Outcomes of Total Hip or Knee Arthroplasty in Patients after Bariatric Surgery versus Patients With and Without Obesity

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Background: Osteoarthritis is common among patients with obesity due to increased force on knee and hip joints, and altered gait due to excess weight. Postoperative complications after total knee arthroplasty (TKA) and total hip arthroplasty (THA) are increased among patients with obesity. The objective of this study was to evaluate the outcomes after TKA/THA in patients after bariatric surgery compared to a cohort of patients with and without obesity who have not undergone bariatric surgery.

Methods: A retrospective review of the medical records of all patients who underwent bariatric surgery from 2001-2014 with subsequent TKA/THA was completed. Bariatric surgery patients were compared to patients with obesity (obese group; BMI \geq 30 kg/m²) and without obesity (non-obese group; BMI <30 kg/m²) who underwent TKA or THA from 2012-2014. Hip/Knee Disability and Osteoarthritis Outcome Scores (HOOS and KOOS) were evaluated preoperatively and at 1 year postoperative. Statistical analysis included chi-square test, *t*-tests, and ANOVA. A *P*-value <0.05 was considered significant.

Results: There were 939 patients included; 66 post-bariatric surgery patients (62 had laparoscopic Roux-en-Y gastric bypass, 4 had laparoscopic sleeve

gastrectomy) underwent TKA/THA, and were compared to 566 patients in the obese group and 307 patients in the non-obese group who underwent TKA/THA. The post-bariatric surgery group had a higher proportion of female patients (77% vs. 50% vs. 51%; $P < 0.001$), were younger (56.3 vs. 65.2 vs. 69.7 years; $P < 0.001$) and had the highest pre-TKA/THA BMI (37.6 vs. 36.7 vs. 26.4 kg/m²; $P = 0.003$) compared to the obese and non-obese groups, respectively. Median operative time was highest among post-bariatric surgery patients, and length of stay (LOS) was similar among all three groups (Table). Surgical site infections (SSI) were highest in the post-bariatric surgery and obese groups compared to the non-obese group (Table). Mean follow-up duration was 3.2 years in the post-bariatric surgery group, and 1.5 years for both the obese and non-obese groups. At 1-year postoperative, BMIs were similar to the preoperative values in each group (Table).

Conclusions: Improved joint function was observed in all 3 groups after TKA/THA as demonstrated on the HOOS and KOOS analysis. Surgical site infection rates were similar among post-bariatric surgery and patients with obesity, and lowest rate was observed in the non-obese group, further supporting the risk of obesity and SSIs. No significant postoperative weight loss was observed in any of the patient groups after TKA or THA.

A5116

Bariatric Surgery in the Elderly: Single Center Medium-term Outcomes

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Introduction: Surgical treatment of obesity in the elderly remains controversial. Bariatric surgery is the most effective therapy for morbid obesity and related comorbidities. In an effort to minimize the health consequences of morbid obesity in an aging population and in light of advancement in minimally invasive surgical techniques and multidisciplinary efforts, bariatric surgery is being used more commonly in older patients. Still only few studies have evaluated the clinical effects of bariatric surgery in this population.

Aim: To evaluate safety and medium-term outcomes in morbidly obese patients aged ≥ 60 years undergoing bariatric surgery at a single institution.

Method: This was a single-center retrospective study of prospectively collected database evaluating a minimum of 2 years outcomes of patients, 60 years or older, who underwent surgical treatment of obesity, by either laparoscopic sleeve gastrectomy (LSG) or laparoscopic Roux-en-Y gastric bypass (LRYGB), from January 2006 till March 2014.

Results: We had 81 patients in our cohort; 80% (N=65) of them had LSG. All procedures were successfully completed laparoscopically. The average age was 63 \pm 3.2 years, mean BMI of 49.6 \pm 8.2 kg/m²; 58% of patients were hypertensive and 50.6% type 2 diabetics (DM2). The incidence of complications in two years (major and minor) in patients was 9% (N=7): one patient got myocardial infarction, one got leak post LRYGB, two got bleedings requiring transfusion, two got port site hernias and one got urinary tract infection. There was no 30 day mortality in this cohort. The mean percent excess weight loss (%EWL) at 2 years was 44.5 \pm 21.7 %. There was improvement of DM2 in 75% of patients with total remission in 41 % and partial in 34%. There was improvement in arterial hypertension in 56% of patients. Rate of re-operation for unsuccessful or unsatisfactory weight loss was 11% (N=9), 7 patients were offered biliopancreatic diversion with duodenal switch, one patient was offered conversion to Roux-en-Y gastric bypass and one patient required resleeve for sleeve pouch dilatation.

Conclusion: Bariatric surgery is safe and effective in morbidly obese patients older than 60 years; comparison to younger matched cohort is still required to compare its safety, efficacy and rate of reoperation for failure.

A5117

CLINICAL UTILITY OF SCALE OS-MRS IN LAPAROSCOPIC BARIATRIC SURGERY PATIENTS. A RETROSPECTIVE STUDY

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CLINICAL UTILITY OF SCALE OS-MRS IN LAPAROSCOPIC BARIATRIC SURGERY PATIENTS. A RETROSPECTIVE STUDY Jose Abraham Trujillo-Ortiz MD1, Norberto Muñoz-Montes MD1, Judith Rodriguez-Garcia MS11 Hospital Regional de Alta Especialidad del Bajío, Leon, Guanajuato, Mexico.

Background: The prevalence of overweight and obesity continues to rise worldwide, it has been reported that the most effective treatment for morbid obesity is bariatric surgery, however laparoscopic bariatric surgery still associated with postoperative complications and mortality. Has been demonstrated that intraoperative adverse events are common in this type of surgery and these events are positively associated with increased risk of postoperative complications. Shimizu et al in 2013, reported that the proportion of complications in laparoscopic bariatric surgery was 24.8%: 15.7% was presented in early stage and 9.1% late stage. The scale Obesity surgery mortality risk score (OS-MRS) has been proposed as an easy instrument to use for risk assessment and risk stratification of patients undergoing Roux-en-Y gastric bypass. The aim of this study is to evaluate the clinical utility of the risk scale OS-MRS in patients undergoing laparoscopic bariatric surgery at the Hospital Regional de Alta Especialidad del Bajío (HRAEB).

Methods: The electronic medical records of the patients undergoing laparoscopic Roux-en-Y gastric bypass from March 2009 to September 2015 at the HRAEB were analyzed. The scale OS-MRS was applied retrospectively; complications were classified according to Dindo-Clavien. SPSS 20 was used for statistical analysis; the sample was divided into three subgroups according to the rating given by the scale OS-MRS and the presence of minor and major complications compared with a chi-square test. The diagnostic yield of the test was calculated by the sensitivity, specificity, positive predictive value, negative predictive value, and reason for positive and negative likelihood. A P value less than 0.05 was considered statistically significant.

Results: There were 86 patients underwent laparoscopic Roux-en-Y bariatric surgery, 36 were men (42.7%) and 49 were women (57.6). The average age was 41.75 (<u>+</u> 9.76) years and BMI average 50.9 (<u>+</u> 10.04), 36 (42.4%) had systemic arterial hypertension. Ten patients (11.8%) were at risk of pulmonary thromboembolism (PTE). 17 patients (20%) had minor complications: 6 patients (7.1%) with seroma, 1 patient (1.2%) with gastroparesis, 2 patients (2.4%) had hypertensive crisis, 1 patient (1.2%) with urinary infection, 2 patients (2.4%) developed surgical site infection, 2 patients (2.4%) with transfusion enterorrhagia and 3 patients (3.5%) with intra-abdominal abscess. 5 patients (5.9%) had major complications: 1 patient (1.2%) had gastric leak, 1 patient (1.2%) with ileal perforation and 2 patients (2.4%) died during the

period, one of them for the presence of mesenteric thrombosis by an internal hernia and one from thromboembolism pulmonary. According to the scale OS-MRS, patients were classified into 3 groups: 40 patients (47.1%) in the low-risk group (A), 34 (40%) in the moderate-risk group (B) and 3 patients (12.9 %) in the high risk group (C). Comparing risk groups with the complications a P-value of 0.480 for patients with minor complications and a P-value = 0.720 for patients with major complications was found.

Conclusion: Considering the limitations of the study (retrospective cohort and small sample size), the risk scale OS-MRS is apparently not useful for assessing the postsurgical risk of laparoscopic Roux-en-Y gastric bypass due to the low sensitivity and specificity obtained, besides not found significant differences between risk groups (A, B and C) and the complications according to Clavien-Dindo classification result not statistically significant.

A5118

Impacts of sex and age on weight loss after bariatric surgery: Based on a nationwide survey of Korean Society of Metabolic and Bariatric Surgery (KSMBS)
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Background and Aim: Gastric banding (GB), Roux-en-Y gastric bypass (RYGBP) and Sleeve gastrectomy (SG) are the most common bariatric procedures undertaken globally but there are no evidenced-based criteria that inform the selection of one operation over the others. The purpose of this study was to evaluate the impacts of sex and age on weight loss after bariatric surgery, in order to optimize the recommendation of appropriate procedure for undergoing bariatric surgery.

Materials and Methods: Based on a nationwide survey about the operations and outcomes from January 2003 to December 2013 performed by KSMBS, 2576 case from 7 institutions were collected and analyzed. Multi-center two-year follow-up data of all adults who underwent GB (n=1884), RYGBP (n=311), or SG (n=381) were included. Serial data of body weights and % excess body weight loss (%EBWL) according to the age, sex and operation types were analyzed by t-test and one-way ANOVA.

Results: The ratio of M:F was 1:4.4. The number of young patients under 40 years old was 1877 (72.9%) and that of old was 677 (26.3%). There was no significant difference in %EBWL according to sex. The % EBWL was significantly higher in young patients group at 2 year F/U (57.3+38.3 and 50.3+32.9% in

young and old age group ($p=0.043$). In terms of operation types, the % EBWL were highest in RYGBP and lowest in GB at all period ($p<0.001$). In subgroup analysis, men under 40 years obtained higher weight loss in RYGBP and SG compared to GB (41.9+-27.9, 66.0+-29.8, and 61.2+-17.2% in GB, RYGBP, and SG at 24 month, $p=0.005$). Old men group obtained higher weight loss in RYGBP compared to GB and SG (50.0+-23.4, 90.7+-36.1, and 42.8+-18.2% in GB, RYGBP, and SG at 24 month, $p=0.003$). Women under 40 years obtained similar weight loss among operations (53.9+-48.9, 66.4+-21.2, and 64.4+-24.0% in GB, RYGBP, and SG at 24 month, $p=0.076$). Old women group obtained higher weight loss in RYGBP compared to GB and SG (38.8+-27.7, 62.4+-34.7, and 39.2+-21.9% in GB, RYGBP, and SG at 24 month, $p<0.001$).

Conclusion: Our results show that patient sex and age significantly impact on weight loss in a procedure-dependent manner and should be considered when choosing operation types. For patients more than 40 years old, % EBWL was highest in RYGBP regardless of sex. Although % EBWL of GB was the lowest among three procedures, it was comparable to other procedures for female patients under 40 years old. Keywords: Bariatric procedures, Sex, Age, Weight loss

A5119

Impact of Social Media on Bariatric surgery

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Background: The use of social media has grown rapidly in the recent past. In health care, social media links Healthcare organizations and clinicians to patients. Academic and private institutions try to dominate the networks to influence the patients to augment the stature and publicize their accomplishments. Our aim was to explore the influence of the 3 major social networks namely Facebook, twitter and YouTube on Bariatric Surgery institutions, journals and nonprofit organizations.

Methods: A list of Bariatric Surgery Institutes that are registered with American College of surgeons (ACS) and Metabolic and Bariatric surgery Accreditation and Quality Improvement program (MBSAQIP) were identified and an online search was conducted by 2 independent authors who then performed a 2-pronged search to identify all

accounts of Facebook, Twitter, and YouTube that were relevant to Bariatric Surgery. The Identified institutes were divided either as Academic or Private, and all the social media accounts were ranked based on their 'Likes', 'Followers' and 'Subscribers'. Disparity between Reviewers were resolved by general agreement, and if needed, with a third reviewer.

Results: A total of 692 Bariatric organizations were registered with ASMBS and MBSQIP. Among these, 1294 accounts were identified (574 in Facebook, 436 in Twitter and 284 YouTube accounts). Nearly 60.5% were private organizations and 39.5% Academic. The Academic and private organizations had a similar median number of 'likes', 'followers', 'subscribers' on Facebook, twitter and YouTube respectively. Five journals have been identified out of which only 3 had an active Facebook and Twitter account. One nonprofit organization was associated with a Facebook and twitter account. The social media impact on Bariatric surgery showed a similar pattern comparable to that on other medical specialties.

Conclusion: This study shows the influence of social media on Bariatric surgery through different social media platforms and number of users in the online networking community. We found that the private Bariatric organizations were more prevalent on the social media than the academic institutions. Content relevance and optimization remains unanswered on the part of academic organizations. We recommend that the academic programs gain more popularity on the social media sites to enhance better communication between the healthcare and patients

A5120

Bariatric Surgery in the Elderly Male Veteran

Population: Low Readmission Rates and Successful Outcomes

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Rates of obesity in the elderly population are increasing. Age, gender and weight related comorbidities might contribute to poor outcomes in bariatric surgery. We sought to evaluate a cohort of elderly Veterans undergoing bariatric surgery. After IRB approval, data were collected from a prospectively managed bariatric surgery database at an academic-affiliated, Veterans Affairs Medical

Center. Primary bariatric cases in patients aged ≥ 60 years were identified. Data from this cohort was then extracted and analyzed. Bariatric surgery was performed in 286 patients between 2001-2015. A cohort was selected that included 76 patients who were older than 60 years (range 60-69) with a mean age of 63.6 years. Their mean BMI was 44.3 kg/m², mean ASA 3 and gender make-up was 90% male. Preoperatively the majority of patients had type II diabetes 64.5% (49), hypertension 92.1% (70), obstructive sleep apnea 76.3% (58), hypercholesterolemia 85.5% (65), gastroesophageal reflux disease 53.9% (41) or osteoarthritis 69.7% (53). 63.2% (48) had a preoperative psychiatric diagnosis and 18.4% (14) had coronary artery disease that required preoperative intervention. Sleeve gastrectomy was performed in 54 patients (71%) and Roux-en-Y gastric bypass was performed in 22 patients (29%). All but two of the procedures were completed laparoscopically. The rate of early postoperative complication was 10.5% (3 Clavien-Dindo grade II and 5 Clavien-Dindo grade III). The mean inpatient length-of-stay was 5.3 days. Thirty-day mortality was 0% and the 30-day readmission rate was 2.6%. Causes of readmission included anastomotic leak (1 patient) and pneumothorax following air travel home (1 patient). Percent Excess Body Mass Index Loss at 1, 3 and 5 years was 58.1%, 51.5% and 55.1%. Percent Total Weight Loss at 1, 3, and 5 years was 23.1%, 20.2% and 21.5%. Mean patient follow-up was 49.6 months. Percent follow-up at 1, 3 and 5 years was 100%, 97.5% and 90%. Successful bariatric surgery outcomes can be achieved in this unique population of elderly, predominantly male, Veterans with resultant low morbidity, low mortality and low readmission rates.

A5121

Bariatric Surgery Insurance Requirements Independently Predict Surgery Dropout

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Background: Insurance companies have considerable pre-bariatric surgery requirements despite lack of evidence in improved outcomes. Previous studies have analyzed mandated diet programs' impact on surgical delay, surgical drop-out and weight loss pre- and post-operatively; however, this is the first study to look at the association between multiple insurance requirements and failure to undergo surgery. We hypothesize company specific requirements are independently predictive of progression to surgery and time to surgery from initial consultation.

Methods: Prospective data collection was performed for patients undergoing bariatric surgery evaluation by two surgeons from 2010 to 2015 at a major academic medical center. 1475 subjects using 12 major insurance payers or self-pay were grouped into those who underwent surgery (SGY; n= 827) or did not undergo surgery (no-SGY; n= 648). Univariate analysis was performed with appropriate parametric and non-parametric test to identify differences in comorbidities and insurance requirements between groups. Multivariate logistic regression was used to adjust for all preoperative factors and determine which parameters are independently predictive of failure to proceed to surgery. Finally, a linear regression was fit for all patients who proceeded to surgery to identify which factors predict longer interval between initial evaluation and surgery.

Results: The surgical group had lower rates of COPD (1.1% vs 3.3%, p=0.01) and tobacco use (0.9% vs 2.5%, p=0.01) as well as a higher rate of diabetes mellitus (40.2 vs 31.9%, p=0.001). Groups had comparable mean BMI's (SGY=49.1; no-SGY=49.4). Factors associated with surgery drop-out included longer median diet duration (SGY=3 months; p< 0.001; no-SGY= 6 months, p<0.001); PCP letter of necessity (26.7% vs 12.9%, p<0.0001); laboratory testing (21.9% vs 10.7%, p=0.019); and evaluation by cardiology (22.3% vs 9.1%, p<0.001), pulmonology (24.8% vs 10.7%, p<0.0001), and psychiatry (86.1% vs 78.7%, p=0.0003). Table 1 represents a logistic regression of factors which were predictive of surgery. Insurance requirements independently predictive of failure to proceed with surgery included longer diet requirement, PCP letter, cardiology or pulmonology evaluation, laboratory testing and non-private insurance status. The model has moderate discriminatory power with an area under the curve (c-statistic) of 0.711. Additionally, surgical patients had an average interval between initial visit and surgery of 5.8+-4.6 months with

statistically significant weight gain (2.1 kg, $p < 0.0001$). Cardiology evaluation (3.7 month increase, $p = 0.01$) and advanced laboratory testing consisting of either TSH or serum H. pylori testing (3.3 month increase, $p = 0.03$) were the only significant predictors of increased interval between initial evaluation and surgery.

Conclusion: The results show that many pre-bariatric surgery insurance requirements have a negative impact on patient progression to surgery. Strongest insurance predictors of bariatric surgery dropout included longer diet requirement, PCP letter, cardiologist or pulmonologist evaluation, and non-private insurance. In addition, delays in surgery are associated with pre-operative weight gain. These findings have major policy implications suggesting insurance requirements are unnecessary barriers to potentially life saving treatment.

A5122

Preventing Returns to the Emergency Department Following Bariatric Surgery: Lessons Learned From the Early Years of a Bariatric Program

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Abstract Objective: To identify potential strategies aimed at preventing unnecessary returns to the emergency department (ED) following bariatric surgery.

Background: Potentially avoidable ED visits represent a significant source of inefficient resource utilization. We reviewed our clinical experience accrued during the first four years of a new university-based bariatric surgical program in order to identify strategies aimed at mitigating unnecessary postoperative ED usage.

Methods: The electronic medical records of all patients who underwent bariatric surgery at our institution between January 2011 and October 2015 were retrospectively reviewed. Information regarding gender, age, pre-operative BMI, obesity-related comorbid conditions, postoperative length of stay (LOS), and reasons for ED visits within 90 days of surgery were obtained. Charlson Comorbidity Indices (CCI) were calculated for each patient. Rationales for ED returns were independently

reviewed by six practitioners (three attending surgeons, one resident physician, and one physician assistant). Reasons for ED returns were deemed either potentially preventable (P) or non-preventable (NP). 'Preventable' was used to denote that a particular ED return could potentially be avoided by means of a system change in our bariatric practice (e.g. intravenous fluids administered in clinic).

Results: Our institution performed 361 bariatric procedures during the study period. Of these, 65 patients had 91 ED visits, 23 of which resulted in readmissions, and two of which required operative interventions. The average CCI of patients returning to the ED was 1.4 (range 0-8). On average, patients returned to the ED on postoperative day (POD) 26.5 (range 2-90 days). The ≤ 90 -day all-cause postoperative ED visit rate was 18% ($n = 65$). Of the 91 ED visits, 47% were deemed preventable ($n = 43$). The most common preventable reasons for ED returns were dehydration (35%), postoperative pain (33%) and wound evaluations (21%).

Conclusion: Postoperative ED visits following bariatric surgery are prevalent and result in increased cost for patients and the healthcare system. The most common reasons for postoperative ED visits in our practice were conceivably preventable. Implementing outpatient strategies to address these causes will likely attenuate inefficient resource utilization.

A5123

Higher BMI and Weight Related Public Distress May Predict Unnecessary Returns to the Emergency Department Following Bariatric Surgery

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Abstract Objective: To better characterize predictors of inefficient emergency department (ED) utilization following bariatric surgery.

Background: Avoidable use of ED services can significantly increase patient and health-care costs. As such, an increasing emphasis has been placed on avoidance of unnecessary ED visits following bariatric surgery. Psychosocial factors, including anxiety, emotional distress, binge-eating behaviors, social support, and quality of life may influence inappropriate utilization of ED services and patients

with these qualities might be targeted for anticipatory guidance to decrease their likelihood of presenting to the emergency department with non-emergent concerns.

Methods: The records of 204 consecutive bariatric surgery patients (56 men and 148 women) were independently retrospectively reviewed and examined for ED visits occurring within 90 days of surgery. Patient gender, age, Charlson Comorbidity Index (CCI) and preoperative BMI were obtained. Additionally, preoperative psychological evaluations were analyzed for measures of anxiety (GAD-7), binge-eating (BES), depression (PHQ-9), level of social support (DUSCOS) and weight-related quality of life (IWQoL-Lite). ED visits were independently coded into 3 categories by an attending surgeon and two residents: No ED Visits (n=179), Diagnostic (an acute or subacute medical or surgical problem was identified) ED Visits (n=16), and Non-Diagnostic (no medical or surgical problems were identified) ED Visits (n=9). One-way ANOVAs were conducted to test differences between the 3 groups.

Results: Two variables were found to be statistically significant predictors of non-diagnostic postoperative returns to the emergency department following one-way ANOVA computation: BMI $F(2, 193) = 4.69, p = .01$ and weight-related quality of life - Public distress $F(2, 197) = 3.89, p = .02$.

Conclusions: Unnecessary returns to the ED following bariatric surgery are a source of inefficient health care resource utilization. Identifying factors predictive of patient risk for inappropriate ED usage is an important first step in mitigating this phenomenon. Our data suggests that patients with a higher BMI and more severe weight-related public distress are at increased risk for non-emergent visits to the ED following bariatric surgery.

A5124

The outcome of bariatric surgery in patients aged 75 years and older

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Introduction: Bariatric surgery has been shown to be relatively safe and effective in patients age 60-75 years; however, outcomes in patients age 75 or

older are unknown. The aim of this study is to evaluate outcomes of bariatric surgery in patients age 75 or greater at our institution.

Methods: Patients aged 75 years and older who underwent bariatric procedures in two academic centers from 2006 to 2015 were identified. Data collected included baseline demographics, comorbidities, perioperative parameters, length of stay, morbidity and mortality and weight loss at one-year follow-up. Data was summarized as the median and range for continuous variables and as counts and frequency for categorical variables.

Results: A total of 19 patients aged 75 years and above were identified. Eleven (58%) were male, median age was 76 years (range 75-81) and preoperative body mass index (BMI) was 41.4 kg/m² (range 35.8-57.5). Comorbidities included hypertension (n=17, 89%), dyslipidemia (n=11, 74%), diabetes mellitus (n=11, 74%), sleep apnea (n=11, 74%), heart disease (n=11, 58%), chronic obstructive airway disease (n=5, 26%), history of thromboembolism (n=4, 36%) and fatty liver (n=3, 16%). The functional class was 2 (84%) and 3 (16%). All the bariatric procedures were primary procedures and performed laparoscopically: sleeve gastrectomy (n=11, 58%), adjustable gastric band (n=4, 21%), Roux-en-Y gastric bypass (n=2, 11%), banded gastric plication (n=1, 5%), and gastric plication (n=1, 5%). The median operative time was 120 minutes (range 75-240) and the length of stay was 2 days (range 1-7). There were 3 patients who developed postoperative atrial fibrillation which was completely resolved at discharge; otherwise, there was no 30-day readmission, re-operation or mortality. At 1 year follow up, the median excess weight loss (EWL) was 44.8% (range 8.3-66.1). There was no readmission, re-operation or mortality. Two patients had poor oral intake which was managed with nutritional consultation and one of the three patients had recurrent atrial fibrillation which required anticoagulant treatment.

Conclusion: Our experience suggests that bariatric surgery in selected patients age 75 years and older is relatively safe and effective despite advanced age and higher risk. Age alone should not be the limiting factor for selecting patients for bariatric surgery.
Keywords: Bariatric surgery, 75 years, mortality, morbidity, sleeve gastrectomy, risk factor, elderly

A5125

Social media footprint of weight loss surgery compared to lifestyle interventions mirrors the underutilization of surgery to treat obesity

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Background: The surgical treatment for obesity is a safe and highly effective method to treat morbid obesity, yet the vast majority of individuals whose severe obesity meets surgical eligibility do not undergo surgical evaluation or treatment. The recent explosion of social media and its high penetrance in this patient population may provide important insight regarding public perception of weight loss and its surgical treatment. Instagram and YouTube are social media platforms that see heavy user traffic. Instagram, with over 400 million active users, and YouTube with over 1 billion viewers, allow participants to connect and exchange information regarding topics of interest, including obesity, weight loss, and obesity surgery. We sought to determine the level of representation of bariatric surgery on these particular platforms.

Methods: Twenty-one of the most prevalent phrases or acronyms related to weight loss and obesity surgery were searched as hashtags on the Instagram app and keywords for YouTube videos. The number of posts relating to each hashtag or key work was recorded and a word cloud was generated using free software from www.wordclouds.com. The resultant word cloud uses varying font sizes to represent the relative number of posts for each hashtag.

Results: Hashtags on Instagram relating to 'diet' and 'fitness' vastly outnumbered hashtags related to weight loss surgery by 40:1. Although #weightloss had over 20 million posts on Instagram, weight loss surgery accounted for less than 500,000 posts. Similarly, videos on Youtube relating to weight and weight loss outnumbered videos relating to the surgical treatment for obesity by nearly 50:1. The most common obesity surgery referenced was the vertical sleeve gastrectomy, followed by gastric bypass, lap band and duodenal switch.

Conclusion: Social media serves as a robust platform for interchange regarding obesity and weight loss. The surgical treatment for obesity has a definite presence in social media, but it is dwarfed by the overall weight related exchange. Interestingly, this disparity in proportionality is almost exactly that which is noted in terms of the proportion of eligible individuals who undergo obesity surgery in the U.S. As such, attention to visibility on social media platforms may improve access, perception and use of surgery to treat obesity.

A5126

Mammographic Correlates of Surgical Weight Loss

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Introduction: Obesity and high radiologic breast density independently increase the risk of breast cancer. Increased breast density decreases the sensitivity of screening mammograms. This study evaluated the effect of surgical weight loss on mammographic density.

Methods: Medical records were retrospectively reviewed to identify patients who had undergone bariatric surgery and mammography at an academic medical center. Data regarding demographics, comorbidities, development of cancer, and genetic mutation status were collected. Patients included had a mammogram (MMG) prior to and <u></u>1 year after surgery. Fellowship-trained breast imaging radiologists blinded to the timing of each MMG independently reviewed each MMG to assign BIRADS categories.

Results: 276 charts were reviewed, 63 patients met inclusion criteria (mean age 54; n=41 Caucasian, n=22 African American). 4 patients were BRCA mutation carriers. Comorbidities included hypertension n=49(78%) and diabetes mellitus n=31(49%). Patients underwent gastric bypass (n=7) or sleeve gastrectomy (n=56). The mean weight loss was 28.7 kg. The mean initial BMI 44.3 kg/m² (range 33-77) was significantly greater than the final BMI 33.6 kg/m² (range 20-62; P <0.01). Density was unchanged in 53, decreased in 1, and increased in 9 patients. Of those 9 patients, 5 patients changed from entirely fatty to scattered fibroglandular and 4 patients from scattered fibroglandular to heterogeneously dense. Their mean weight loss was significantly greater vs. the cohort (37.7 vs. 28.7 kg; p<0.01). 4 patients were identified as high risk for cancer development.

Conclusions: Breast density increased in 14% of patients potentially due to less adipose tissue, allowing better visualization of the fibroglandular elements with compression. Because this may mask an underlying malignancy, these patients may benefit from additional screening modalities based on personalized lifetime risk.

A5127

The Stanford Integrated Psychosocial Assessment for Bariatric Surgery: A Preliminary Analysis of Validity and Reliability

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Background: Bariatric surgery is the most effective treatment for morbid obesity and yet up to 30% of post-surgical patients have suboptimal weight loss outcomes (defined as <50% Excess Weight Loss, or %EWL). To date, there are no baseline psychosocial or behavioral variables that reliably predict which patients will experience suboptimal weight loss outcomes. Pre-surgical psychosocial assessments and standardized measures are limited by insufficient characterization of psychosocial or behavioral variables and have to date not yielded predictive value. To address this, we developed the Stanford Integrated Psychosocial Assessment for Bariatric Surgery (SIPABS)-a 19-item screening tool spanning 5 psychosocial domains with demonstrated associations to poor post-surgical outcomes. The SIPABS was adapted from the Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT), a comprehensive screening tool that has been shown to prospectively predict poor medical and psychosocial outcomes for organ transplantation patients.

Methods: To determine inter-rater reliability and any trends indicating predictive validity, the SIPABS was applied retroactively to the clinical charts of 62 patients receiving bariatric surgery in 2012 in the Stanford University Medical School Bariatric Surgery Clinic. Review of the pre-surgical psychosocial evaluation was performed by 4 raters (two Psychologists, and two advanced doctoral students in clinical psychology). Inter-rater reliability was calculated for the following domains by averaging Cohen's Kappa (K) for each rater set: 1) Readiness for Surgery (K=.6, p= .36); 2) Availability and Functionality of Social Support (K=.43, p = .26); 3) Psychopathology (including Eating Disorders) and 4) Coping (K=.61, p< .001). These early results suggest moderate inter-rater reliability which may increase when the study reaches the anticipated n=100. Predictive validity was modeled using linear regression. When all 19 items were added to the model with weight loss at 2 years as the dependent variable, higher scores significantly predicted lower

weight loss outcomes (F=2.615, p=.01). Individual items that significantly predicted lower weight loss outcomes were Presence of Psychopathology and, Understanding of the bariatric surgery process. Pearson's correlations revealed additional trends that Compliance with Medical Recommendations (as evidenced by compliance history prior to surgery) (r=.256, p=.045) and Availability of Social Support were significantly associated with weight loss outcomes 1 year after surgery (r=.256, p=.045). Furthermore, weight loss outcomes 2 years after surgery were significantly correlated with compliance (r=.413, p=.007), the availability of social support (r=.413, p=.007), eating disorder psychopathology (r=-.385, p=.012), and overall coping to past and current stressors (r=.352, p=.002). Although a larger n is needed to fully understand predictive validity and interrater reliability and of the SIPABS, these preliminary findings suggest that there is an association between poor post-surgical outcomes and the presence of the evaluated psychosocial and behavioral factors. Such data may help predict which individuals will be most at risk for suboptimal weight loss outcomes post-bariatric surgery, allowing for targeted interventions on the specific psychosocial deficits identified in the screening.

A5128

Outcomes of Bariatric Surgery in Patients with Selected Connective Tissue Diseases

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Background: Obesity and weight-related comorbid disease affects a large number of people with a variety of other chronic diseases as well. Bariatric surgery is shown to have higher risk in patients with systemic lupus erythematosus, but there is limited data on patients with other connective tissue disease. We aim to study the safety and effectiveness of bariatric surgery in patients with systemic sclerosis (SS), mixed connective tissue disease (MCT), and Raynaud's syndrome (RS).

Method: After institutional review board approval, patients who under laparoscopic bariatric surgery with a diagnosis of SS, MCT, and RS were identified. Demographics, perioperative data, and postoperative outcomes were evaluated.

Results: From 2005 to 2015, laparoscopic sleeve gastrectomy (LSG), laparoscopic Roux-en-Y gastric bypass (LRYGB), or laparoscopic adjustable gastric banding (LAGB) were performed on a total of 34 patients with SS, MCT or RS. Eight patients had SS (4 LSG, 4 LRYGB), 10 had MCT (1 LSG, 9 LRYGB), and 16 had RS (9 LSG, 6 LRYGB, 1 LAGB). At 1-year follow up, mean body mass index decreased from 44.5 to 32.4 ($p < 0.005$), and excess weight loss was 65.5%. One patient with MCT undergoing LRYGB had early postoperative leak that required reoperation, and 1 patient with RS on chronic anticoagulation had postoperative intra-abdominal bleeding after LAGB that required transfusion. Early major complication rate was 6%. At medium term follow up, 1 patient with SS developed gastrojejunal stricture, and 3 patients with MCT had marginal ulcers. Of the patients who were taking medication for their connective tissue disease prior to surgery, 2 out of 4 patients (50%) with SS and 1 out of 6 patients (16.7%) with MCT had reduction in their medication dosage at 1 year follow up. None of the 3 patients with RS had reduction in their medications.

Conclusion: Bariatric surgery is effective in weight loss in patients with selected connective tissue disease. In this small cohort, 23% of studied patients had reduction in their connective tissue disease medication. Keywords: connective tissue diseases, bariatric surgery, complications, outcomes

A5129

Retrospective Data Review Comparing Complication Rates and Hospital Length of Stay in the Elderly

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Introduction: Since the advent of the gastric bypass in the early 1960's the prevalence of bariatric surgery has been slowly on the rise worldwide. After the introduction of laparoscopic bariatric surgery and the proven health benefits of it, more people are entertaining the possibility that surgery may be the tool they need to achieve long term weight loss success. Until recently there has been a recommended age limit set at 65 years with few exceptions to the rule except on a case-by-case basis. This was prompted by the idea that the risks of surgery in the older generation outweighed the benefits offered by the surgery. This way of thinking has been challenged in recent years as older patients

seem to tolerate bariatric surgery well and enjoy healthier lifestyles in their golden years. One community hospital, performing a large annual volume of bariatric cases, did a retrospective review of their data to see if elderly patients had higher complication rates, more severe complications when they occurred, and a greater overall average length of stay.

Methods and procedures: Data collected by this community hospital was retrospectively reviewed ranging from July 1, 2012 through July 1, 2015. A total of 916 patients underwent a variety of bariatric procedures mostly consisting of laparoscopic Roux-en-Y gastric bypass, laparoscopic vertical sleeve gastrectomy, and laparoscopic adjustable gastric band placement. These patients were divided into two groups; those 55 years old and younger and those 65 years old and greater. Patients between 56 and 64 years old were excluded from the data analysis. Postoperative complication rates and average length of stay were then analyzed between these groups.

Results: The overall complication rates between the two groups was not appreciably different with the 55 and under group having an overall complication rate of 10.3% and the 65 and greater group having an 11.0% complication rate. The complication severity was not increased in the older population with non-specific abdominal pain being the most common complication documented. The average length of stay for the 55 and under group was 3.61 days and the length of stay for the 65 and older group was 3.56 days.

Conclusions: The review of data from this institution shows that people of all ages can safely enjoy the benefits of bariatric surgery without an increased risk for severe complications or increased length of hospital stay. Assuming the patient is appropriately prepared during the preoperative period and that there are no major comorbidities that would make the surgery a high risk, elderly patients should be offered bariatric surgery to improve their overall health and increase longevity.

A5130

Acute Care Surgery in Populations with Obesity: Does Bariatric/Minimally Invasive Surgical Training Impact Outcomes?

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Background: It is becoming more common for surgeons to manage people with obesity in the acute setting, and it is unclear if bariatric surgical training impacts outcomes in non-bariatric emergencies. We sought to evaluate our experience in the obese population requiring acute surgical management, and to compare outcomes based on surgeon expertise in bariatric surgery versus surgeons without bariatric surgery training.

Methods: A IRB approved retrospective chart review was performed between January 2013-January 2014. Adult patients requiring acute surgical intervention were included in the study. The surgeons that provided care to the study subjects were classified as bariatric surgeons (B, n=2) versus non bariatric surgeons (NB, n=4). Patient demographics, BMI, ASA scores, Charlson comorbidity index scores, and outcomes including OR times, hospital length of stay (LOS), 30 day readmission, and mortality were documented. Outcomes based on surgeon training (B vs. NB) were also compared.

Results: **Demographics:** A total of 203 patients met criteria for study enrollment. The overall BMI was 37 kg/m² <u>+</u>6, and there were n=60 patients with a BMI <u></u> 40 kg/m². The age was 37 <u>+ </u>14 and there were n=110 men and n=93 women. The majority of procedures performed were for standard acute laparoscopic cases (cholecystectomies n=75, appendectomies n=45). Non-routine laparoscopic cases accounted for the remaining and were; acute intestinal obstructions n=9, incarcerated hernias n=17, traumatic injuries n=48, and intestinal ischemia or perforation n=9. **Bariatric vs. Non bariatric surgeons:** Bariatric surgeons performed 35% of the cases vs. 65% for the non-bariatric surgeons. Both groups operated on patients with similar risk profiles: A BMI of <u></u>40 was 35% B vs. 26% NB, P=0.19. Patients with an ASA <u></u>3 were, 50% B vs. 50% NB, P=1.0. A Charlson comorbidity index of 2-5 was 4% B vs. 10% NB, P=0.11. A Charlson comorbidity index of <u></u>6 was 2% B vs. 2% NB, P=1.0. **Operative Data:** Laparoscopic cholecystectomy operative times were similar between bariatric vs. non bariatric surgeons (80 min. <u>+</u> 25 vs. 82 min. <u>+</u> 29), respectively. This pattern was also demonstrated for laparoscopic appendectomy, (63 min. <u>+</u> 21 vs. 64 <u>+</u> 26). In non-routine laparoscopic cases, operative times were also similar at 80 min. <u>+</u> 43 B vs. 83 min <u>+</u> 43 NB. When comparing the number of cases in the non-routine laparoscopic group that were done

laparoscopic, the bariatric surgeons performed the majority, (7% B vs. 2% NB, P=0.001). **Outcomes:** Surgical Site infections were low, (2%B vs. 4% NB, P=0.4). Re-exploration was required 2% and similar in both groups. Early readmission at 30 days was 6% B vs. 7% NB, P=1.0. Overall hospital LOS was higher in the NB group at 9 days <u>+</u> 9 vs. 5 days <u>+</u> 4 B, P=0.05. Mortality for this series was 5% and similar between the study groups.

Conclusions: Acute surgical procedures were performed in the obese population with low morbidity and mortality, despite risk factors such as patients with morbid obesity, high ASA scores and high comorbid indices. Bariatric surgical expertise seemed to favorably impact hospital length of stay and the application of more minimally invasive approaches in cases not routinely done laparoscopic. Further study is warranted to determine if acute care surgeons would benefit from bariatric or other minimally invasive training.

A5131

Demographic variables of morbidly obese populations impact decision to undergo bariatric surgery.

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Introduction: The rising incidence of morbid obesity in the world population, laparoscopic advances with surgical risk reductions, the increasing awareness of the complications of morbid obesity, and recognition of the metabolic impact of surgical weight reduction have dramatically increased the number of bariatric surgical procedures performed. Although the number of patients that contact a bariatric surgery program far exceeds the number that actually receive surgery, little is known about the variables that influence this. We hypothesized that self-referred middle aged females with insurance coverage have the highest probability of coming to surgery. Such information can be very valuable for a bariatric surgery program to plan and strategize new patient screening and evaluation, education, and pre-operative preparation.

Methods: We did a retrospective analysis of a prospectively maintained 10-yr database (2005-2015) that contained basic demographic information

of patients that contacted our program. In this cohort, all patients that returned a completed New Patient Evaluation questionnaire received individual appointments at our bariatric surgery clinic to meet bariatric surgery physician extenders (or Fellow) and surgeon followed by a bariatric surgery education session and a dietary education session. They were then given monthly follow up appointments to evaluate compliance. Psychological clearance by a psychologist was performed separately.

Results: 9926 questionnaires were mailed to patients that contacted our program between 2005-2015 (age 13-79 yrs). 5553 questionnaires were completed and returned to our program (56%), 3366 patients were given appointments (34% of original total), 2693 kept their appointment (27% of original total), 1501 were approved for surgery (15.1% of original total). 1463 received weight reduction surgery (14.7% or 1 in 7 of original total). More females (57%) came to surgery than men. The majority of patients that came to surgery were from the 31-50 year age group (80%) while those >60 yrs were only 5%. Thirty three percent patients with insurance coverage ultimately received surgery (majority had BCBS) while only 3% of those without insurance coverage received surgery ($p<0.001$). There was a greater probability of self-referred patients coming to surgery than physician referred patients (16% vs 14%, $p=0.001$).

Conclusions: Age, gender, referral method, and insurance coverage are key demographic factors that predict whether or not members of morbidly obese populations will receive surgery. Self-referred middle aged females with insurance coverage have the highest probability of receiving bariatric surgery. In our program, the highest number of approved surgeries were from BCBS. **DISCUSSION:** When the vast majority of individuals living with obesity that contact a surgical weight reduction program do not actually follow through with a bariatric surgical procedure (6 out of 7 at our program did not have surgery), the administrative and clinical resources of a purely surgical weight management program can be substantially stretched and stressed. The demographic information that we have harnessed from our 10-year prospectively maintained data base can provide the foundation for novel strategies to streamline the processes used for the evaluation, education and preparation towards bariatric surgery. In future studies we could focus on the 5553 individuals that returned completed questionnaires to our program and then the 1463 that received bariatric surgery, as each of these cohorts will have

additional information in their questionnaires or in the Electronic Medical Record that can be analyzed similarly. Pertinent aspects of the experiences of our program may have relevance to other programs in the country.

A5132

Bariatric surgery in China: How Is This New Concept Going?

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Introduction: Obesity has become an epidemic in developing countries including China. The use of bariatric surgery to treat obesity has grown in popularity worldwide, but it is still a new concept in China.

Objectives: This study aims to investigate the trends in bariatric surgery in China.

Methods: An electronic search of the MEDLINE, EMBASE and Chinese National Knowledge Infrastructure was conducted to select studies for this survey.

Results: A total of 7779 bariatric procedures were reported from 2001 to 2015, most of which (89.2%) were performed in the most recent 5 years. Further, 70.9% of all procedures were performed to treat obesity and related comorbidities, defined as metabolic surgery. The data showed 89.4% of all operations were performed laparoscopically. The absolute number of bariatric surgeries increased 148.7 times in last 5 years compared to the 2001–2005 period. The percentage of laparoscopic Roux-en-Y gastric bypass performed increased from 0% to 62.2%, and the percentage of laparoscopic sleeve gastrectomy, from 0% to 12.7%. The percentage of laparoscopic adjustable gastric banding increased dramatically from 0% to 73.3% in the 2006–2010 period, but it dropped quickly to 12.9% in the 2011–2015 period. Most operations (66.7%) were conducted in the East area, which is the most developed economic region in China. There was limited surgical innovation or original research reported in China.

Conclusions: Bariatric surgery is still at an early stage in China, but is now experiencing an explosive growth. A national registry system needs to be established to record and provide precise data.

A5133

THE BUCKLE OF THE BARIATRIC SURGERY BELT: AN ANALYSIS OF REGIONAL DISPARITIES IN BARIATRIC SURGERY

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Overview: Surgical options have emerged as effective treatment strategies to mitigate obesity-associated comorbidities leading to an overall reduced risk of mortality. Despite the benefits of bariatric surgery, a low portion of the eligible population undergoes weight loss procedures. We aim to determine if regional disparities exist in the United States and the potential effects of any difference.

Materials and Methods: We performed a retrospective, cross-sectional analysis of the National Inpatient Sample database from 2003-2010. We identified four regions of the United States; Northeast, Midwest, West, and South. Endpoints included race, payer status, comorbidities, urban/rural areas and institutional academic status. Surgeon and institutional volume were also included. The sample was analyzed using Chi-squared tests, linear regression analysis, and multivariate logistical regression analysis.

Results: A total of 132,342 cases and 636,320 controls were studied. A majority of the study population was female (62.5%) and white (70.0%) with private insurance (42.0%). The highest prevalence of obesity was identified in the South (39.7%) and the lowest in the Midwest (17.1%). The greatest numbers of bariatric procedures are performed in the Northeast (24.4%) compared to the South (13.9%) and Midwest (13%). After controlling for demographics, the proportion of procedures performed in the Northeast compared to the South (OR 0.52, CI 0.40-0.66, $p < 0.001$) and Midwest (OR 0.50, CI 0.33-0.75, $p < 0.005$) was significant.

Discussion: Significant disparities in bariatric procedures performed were identified in the South and Midwest regions compared to the Northeast despite the South having a higher prevalence of people with obesity. Thus, in order to correct this disparity, additional outreach programs may be necessary.

A5134

Patient Portrayals and Recommendations About Weight Loss Surgery Education

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Background: Weight recidivism can result from failed behavioral modifications after Weight Loss Surgery (WLS). Education plays a key role in habit formation and adherence to lifestyle changes throughout the WLS process. Although MBSAQIP established patient education minimums in 2014,¹ weight loss surgery (WLS) patient education practices is based mostly on expert recommendation, rather than research findings.² Investigation of WLS education practices is needed to examine how effective education before and after WLS may decrease recidivism rates and improve outcomes. A qualitative study was conducted to obtain patient descriptions about education received and subsequent satisfaction level. Findings about the education experienced by patients, in regards to curricula, teaching methods, educator, and educational dose will be shared. Study results can guide future improvements in the educational experience, which may positively influence clinical outcomes for future patients.

Methods: A qualitative descriptive design was used. Semi-structured interviews occurred after participants were identified through purposive random sampling. Patients who had WLS 12-18 months prior at one MBSAQIP Weight Management Center in the Northeastern United States were invited. Patients were excluded if they were under the age of 18, non-English speaking, had a surgical revision, or lived with a partner who also had WLS. Inductive content analysis was performed to identify emergence of common themes. Member-checking confirmed final themes.

Results: As part of the larger study, data saturation was established with eleven interviews (36% male) and resulted in three final themes. Theme One: Programming and Tools illustrated patients' portrayal about educational and supportive programming received before, during, and after their WLS through five sub-themes-Catalyst for Change, WLS Education Programs, WLS Support Programs, Resource Materials, and Client Engagement. In Catalyst for Change, patients perceived WLS as a tool that could stimulate healthy lifestyle changes when accompanied with personal accountability. Four categories of educational programs and three types of supportive programs were described before and after WLS. The sub-themes WLS Education Programs and WLS Support Programs also explained the curricula, activities, content delivery, and educational dose for program types. Resource Materials

included details about oral, written and digital venues that were used by participants for educational purposes. Resources provided by the Weight Management Center and independently discovered by the patient were revealed. Lastly, Client Engagement explained most patients experienced passive learning principles during their WLS education. Patients who took personal responsibility after attending educational sessions to use the information acquired were more satisfied with their results. Active participation was described as vital for optimal outcomes.

Conclusions: This study obtained patient views about WLS education and subsequent level of satisfaction with the experiences. Types of educational and supportive programs were identified, found to be fairly congruent to MBSAQIP Standards, and deemed necessary by patients to support WLS lifestyle. Results can inform MBSAQIP standards, refine education practices, and urge research on the impact WLS patient education has on clinical outcomes. These results intend to add to the existing literature and recommend continued research to develop quality, cost-effective, patient-centered programs in WLS. References 1. Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP). Resources for optimal care of the metabolic and bariatric surgery patient 2014. Standard 5.1 Patient Education Protocols. Chicago, IL: American College of Surgeons; 2014.2. Groller, K.D. The State of Weight Loss Surgery Patient Education: An Examination of the Evidence. Surgery for Obesity and Related Diseases 11.6 (Nov-Dec 2015): S46. Web.

A5135

Is Bariatric Surgery a Luxury? Privately-Insured and Self-Pay Patients Undergo More and Safer Bariatric Surgery.

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Background: One third of adults in the United States are affected by obesity. Bariatric surgery has been shown to be the most effective method of achieving weight loss and diminishing the comorbidities of obesity. Despite these positive outcomes, there may be disparities that exist within the patient population. This study seeks to identify possible disparity in the payer status of patients undergoing bariatric surgery.

Materials and Methods: We performed a retrospective, cross-sectional analysis of the National Inpatient Sample database, the largest all-payer inpatient database, from 2003-2010. We identified adults who underwent bariatric surgery and matched them with appropriate controls. Our primary objective was to examine patients' demographic and economic characteristics, including payer status, hospital region, rural or urban hospital and academic or community practice. The sample was analyzed using Chi-squared tests, linear regression analysis, and multivariate logistical regression analysis.

Results: A total of 132,342 cases and 636,320 controls were studied. The majority of the study sample was female (66.5%), white (70.0%), and had private insurance (42.0%). Medicare (5.1% (OR 0.33, 95% CI 0.29-0.37, p<0.001) and Medicaid (8.7%, OR 0.21, CI 95% 0.18-0.25, p<0.001) patients account for a lower percentage of bariatric cases after controlling for demographic factors. Additionally, public payer status conferred higher complication rates; Medicare OR 1.54 (95% CI: 1.33, 1.78; p<0.001) and Medicaid OR 1.31 (95% CI: 1.08, 1.60; p=0.007).

Conclusions: Public payer status is associated with disparity in delivery of bariatric surgery. This population is also more likely to experience a complication after bariatric surgery.

A5136

The effect of procedure choice. LRYGB vs LSG

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Introduction: Although the long term economic impact of bariatric surgery is well appreciated, its immediate costs are less well studied. The purpose of this study is to analyze in detail the effect of procedure choice in bariatric surgery costs. We have performed a controlled model where we look at final surgical expense as well as the breakdown for each part of the hospital course of a bariatric patient.

Methods: Cost data was collected directly from the financial department of our hospital. The total costs derived from different costs centers. Each cost center represents a different department or service of our hospital that encountered expenses for that particular patient. A model was fitted to control for different presurgical factors: Demographics (Age, sex, race, preoperative BMI), Comorbidities

(Diabetes II, hypertension, history of tobacco use, sleep apnea, GERD) and surgical (length of stay, procedure type, concurrent minor procedure) These models treat the outcome cost as an ordinal variable and describe the odds of having a higher cost. For each model, all relevant variables were included and the variables that had no impact were eliminated. A 'Normalized total cost' was calculated by dividing the total cost divided by the mean total cost. The impact of each procedure choice was then analyzed.

Results: A total of 458 patients were included in the study, 65 underwent LRYGB and 393 LSG. The impact of procedure choice of several cost centers as well as its effect on the grand total is presented on table 1. These models treat the outcome cost as an ordinal variable and describe the odds of having a higher cost. LRYGB was associated with higher costs in Anesthesia, OR supplies, General lab, General radiology, Ultrasound, Operating room costs, physical therapy costs and total costs. LSG was related with higher pathology costs. Telemetry, ICU, Intermediate ICU, Pacu, Med/surg floor, Pharmacy were not associated with higher cost in any procedure.

Conclusion: According to our data, LRYGB is significantly more expensive than LSG. Most of the differences seen have to do with a longer surgery, need for more surgical supplies and need for a closer postoperative care. LSG is a successful bariatric technique that offers similar weight loss over time but a much lower cost.

A5137

Practical Steps to Improve Quality Measures in Bariatric Surgery

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Introduction: Surgical site infection (SSI), readmission rates, patient safety indicators (PSI) and other outcomes have been a strong focus for bariatric surgeons.

Methods: Data from the NHSN, NSQIP, MBSAQIP, DROP and HCAHPS were used to identify opportunities for improvement. Clinical pathways were modified to reduce SSI by: improving documentation of risk factors, increasing antibiotic dose and frequency of dosing, antibiotic irrigation of surgical wound, silver dressings, and verification of wound status by surgical providers. Protocols to reduce utilization of central venous access by removing all central lines within 24 hr. after the

index bariatric procedure were implemented. To reduce re-admissions, discharge education protocols were standardized, follow-up phone calls 48 hr. after discharge were implemented in addition to incorporating a nutritional consultation on first post-op check visit and utilizing an infusion center for intravenous fluid replacement. Changes were implemented in last quarter of 2013 and compliance was monitored in a monthly QIP meeting.

Results: Data is summarized in Table. Post-op DVT/PE (PSI-12) related to central venous catheters decreased to 0/1000. All incidents of 'accidental puncture or laceration' (PSI-15) were reviewed and specific clarifying language (injury is inherent to the complexity of the procedure) was added to the operative reports when appropriate; PSI-15 decreased from 57/1000 to our goal of 1/1000. Data from the NHSN showed a dramatic decrease in SSI. Odds ratio for morbidity and SSI in bariatric patients dropped significantly to 1.28 and 1.36 respectively (risk-stratified NSQIP yearly report). Data from the mandatory, all-inclusive MBSAQIP database confirmed the decrease in SSI rates; SSI were higher in patients with sleeve gastrectomy compared to RYGB. All-cause 30-day readmissions to the hospital dropped from 14% in 2013 to 11% in Q4 of 2015. Throughout the study period, an 'Always' top box response to HCAHPS survey about doctor communication remained at 88%; pain management improved from 67% to 72%. Discharge information was delivered 'always' in 100% of patients surveyed. **Conclusions:** Reducing variability in care by standardizing clinical pathways improves quality measures of bariatric surgery. Hospital data registries such as NHSN can be leveraged to forecast outcomes and give real-time feedback to clinicians. Additional improvement is needed to reduce SSI in sleeve gastrectomy. HCAHPS patient satisfaction scores may respond to quality improvement initiatives and can be linked to outcomes.

A5138

Qualifying for Bariatric Surgery: How important is patient pre-operative weight loss?

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Background: Prevalence of obesity continues persistently, with more than one-third (34.9% or 78.6 million) of U.S. adults being obese (Ogden and Flegal, 2014). Although bariatric surgery has been performed for many years, over the last 20 years it has emerged as a highly effective weight loss intervention that can also improve co-morbid conditions. The health benefits of bariatric surgery are impressive. For example, a meta-analysis of primarily observational data revealed remission of: type 2 diabetes in 77% of patients; hypertension in 66% and; sleep apnea in 88% (Padwal & Sharma, 2009). Unfortunately however, sustained weight loss and associated metabolic benefits are not consistent across patients and regaining weight after bariatric surgery is a well-documented problem. Consistent with the popular maxim that 'the best predictor of future behavior is past behavior,' pre-surgery weight loss is now being considered by some third party health insurance payers as a qualification criteria for bariatric surgery. Following this maxim may prevent patients who have physical disabilities and metabolic issues impeding their pre-operative weight loss from being cleared for a bariatric procedure. The purpose of the present study is to examine the assumption that the best predictor of future weight loss success is past weight loss success on a bariatric surgery patient population.

Method: A retrospective chart review of 257 patients who underwent psychological evaluation for bariatric surgery clearance in an inner city academic hospital was conducted. Subjects mean age was 44, 84% were female, 55% were minorities (47% African-American, 5% Hispanic and 3% Other), 45% were Caucasians and 70% received Roux-en-Y Gastric Bypass (27% gastric sleeve and 3% lap band). Bariatric outcome predictor variables that were evaluated in the present study included patient: demographic characteristics (age, race and gender); basic measures of affective state (level of depression and anxiety); and other potential outcome predictors (number of unhealthy eating triggers and number of bariatric support groups attended). Patients completed a comprehensive questionnaire regarding their social, mental health and co-morbid physical conditions (type-2 diabetes, sleep apnea, hyperlipidemia, hypertension, knee, joint and back pain and pseudotumor cerebri). Post-operative change in BMI was measured at one year follow-up. A general linear regression model was used to evaluate group differences in BMI units and assess independent associations among variables and

change in BMI units. Stepwise regression analyses estimated individual contributions of independent variables to the variance in one year weight loss in BMI units.

Results: Pre-operative weight loss, measured in BMI reduction, was initially a significant predictor of one year post-operative BMI decrease ($p = 0.001$). This was established with a multiple linear regression model of patient characteristics ($F(11, 76) = 4.44$, $p < 0.001$), with an R^2 of 0.391. However, when key demographic variables are added to the equation (age, race and gender), the predictive effect of pre-operative weight loss did not hold. Furthermore, within demographic variables, age had a significant effect ($p = 0.001$) where younger patients tend to reduce more BMI units on average at one year follow-up ($F(6, 99) = 3.70$, $p < 0.0023$), with an R^2 of 0.183. Race approached statistical significance as an outcome predictor ($p = 0.058$) while gender did not predict post-operative outcome. When key biopsychosocial variables were further added (test scores for level of depression and anxiety along with number of unhealthy eating triggers and number of comorbid conditions) to the equation, age ($p = 0.038$) and Hispanic race ($p = 0.012$) had predictive value ($F(10, 81) = 2.80$, $p < 0.005$), with an R^2 of 0.257. The number of co-morbidities approached significance ($p = 0.073$) and patients with more than three co-morbid conditions had less BMI reduction. A summary of Mean BMI decrease across time by patient demographic characteristics is provided in Table 1. All patients had at least at 20% reduction in BMI at one year post-op. A summary of weight loss success (patients who had a BMI reduction of 21%-30% compared to those who had more than 30% reduction in BMI) by selected patient characteristics is provided in Table 2.

Conclusion: In conclusion, the present study results tend to indicate that key demographic and psychosocial variables may be as important as pre-operative weight loss in the prediction of post-operative weight loss success at one year follow-up. The present findings revealed that the predictive value of pre-operative weight loss decreases to a non-significant level with the addition of other outcome predictors. This tends to indicate that pre-operative weight loss should not be considered in isolation when clearance for bariatric surgery is being evaluated. The real world implications here are that perhaps pre-operative BMI reduction alone

should not be considered for bariatric surgery authorization by third party payers.

A5139

Influence of intra-abdominal fat on surgical outcome and overall survival of patients with gastric cancer

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Background: The aim of this study was to evaluate the impact of obesity on surgical outcome and prognosis in patients with gastric cancer.

Methods: A total of 304 patients who underwent curative gastrectomy for gastric adenocarcinoma between January 2005 and March 2008 were enrolled. Body mass index (BMI) was calculated before the operation and visceral fat area (VFA) was measured by abdominal computed tomography (CT). The patients were divided according to BMI class and VFA quartile. The influence of BMI and VFA on surgical outcome and survival was evaluated.

Results: The median BMI was 23.3 kg/m² and the median VFA was 103 cm². There was a significant positive correlation between BMI and VFA. According to BMI class and VFA quartile, there were no significant differences in patients' characteristics or surgical outcome, with the exception of a significantly longer operation time and fewer retrieved lymph nodes in patients with a high BMI and VFA. The unadjusted overall and disease free survival were not significantly different between BMI classes or VFA quartiles.

Conclusions: Obesity, as represented by BMI and VFA, may not be a poor prognostic factor in patients with gastric cancer.

A5140

Iron Deficiency in Bariatric Surgery Patients - a Single Centre Experience Over 5 Years

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Iron deficiency and associated anemia is a well-recognized consequence of bariatric surgery. There is increasing focus on adequate iron supplementation before and after surgery, including the establishment of minimum preoperative ferritin levels. Our study set out to determine the incidence of iron deficiency and anemia one year

postoperatively as well as the impact of a more aggressive perioperative supplementation algorithm. Patients undergoing bariatric surgery at Victoria General Hospital from 2010 to 2014 were included in the analysis. Commencing in the fall of 2014, patients were supplemented with iron preoperatively to a minimum ferritin level of 50 µg/L before proceeding with surgery. Data that was captured included age, gender, date of surgery, BMI pre- and post-operatively (3, 6, and 12 months), iron and ferritin pre- and 12 months post-operatively, and hemoglobin pre- and 12 months post-operatively. Data was analyzed with t-tests and standard analysis of variance (ANOVA), as well as latent trajectory analysis. A total of 399 patients were included. Fifty-three percent of the patients had a complete set of lab data available out to one-year post-op, including BMI, iron, ferritin, and hemoglobin levels all at 12 months post-op. This group consisted of 182 (86%) gastric bypasses and 30 (14%) sleeve gastrectomies. The maximum operable BMI increased with time from a mean pre-op BMI of 42.1 in 2010 to 46.1 in 2014, reflecting the increase in maximum BMI accepted by the program. Using latent trajectory analysis, it was demonstrated that the rate and amount of weight loss over time was equal regardless of preoperative BMI, with a mean 12-month loss of 14 BMI units. This correlated well with the ANOVA model demonstrating an increase in 12-month postoperative BMI from 30.0 in 2010 to 32.3 in 2014 (p=0.01). Corresponding to an evolving perioperative nutrient regimen and more aggressive preoperative iron supplementation, the 12-month iron and ferritin levels also increased during the same time period from 12.9 to 18.3 µmol/L (p=0.001) and 64 to 124 µg/L (p=0.001), respectively, with no statistically significant difference in the 12-month post-operative hemoglobin levels. Bariatric surgery performed for increasing maximum operable BMIs can be expected to obtain equal, but proportional, weight loss. Additionally, when bariatric surgery is performed with more aggressive perioperative iron supplementation, it can result in increasing iron and ferritin levels at one year postoperatively. This is not associated with a change in hemoglobin at one year.

A5141

Analysis of the factors involved in bariatric surgery costs

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Introduction: The better understanding of how various patient-specific factors relate to costs, could improve the efficiency of various hospital departments, as well as hospital systems as a whole. The purpose of this study is to analyze in detail the effect of presurgical factors in bariatric surgery costs. For this, we have performed a controlled model where we look at final surgical expense as well as the breakdown for each part of the hospital course of a bariatric patient.

Methods: A retrospectively reviewed was performed to include all primary laparoscopic sleeve gastrectomies or primary laparoscopic Roux-en-Y Gastric bypasses from 2013 to 2014 at our institution. A model was fitted to control for different presurgical factors: Demographics (Age, sex, race, preoperative BMI), Comorbidities (Diabetes II, hypertension, history of tobacco use, sleep apnea, GERD) and surgical (length of stay, procedure type, concurrent minor procedure). Cost data was collected directly from the financial department of our hospital and structured in different costs centers. Each cost center represents a different department or service of our facility that encountered expenses for that particular patient. Each department was studied individually to account for the effect of each factor when all others variables are constant. For each cost center, backwards elimination was used to choose a similar model containing only a subset of the initial predictors. This procedure used a residual chi-squared P -value of 0.6 as the stopping point for the elimination of model.

Results: A total of 458 procedures were included in the study, 65 underwent LRYGB and 393 LSG. The impact of each factor on cost centers as well as its effect on the grand total is presented on table 1. These models treat the outcome cost as an ordinal variable and describe the odds of having a higher cost. Length of stay (LOS) seems to be the factor that is related to higher costs in most departments followed by having performed a concurrent minor procedure with the primary surgery. Female sex seems to be related with lower costs in most departments. The details of the impact of each factor separated by department is reported in table 1.

Conclusion: According to our data, age, preop BMI, length of stay and concurrent procedures increase

the overall cost of bariatric surgeries. On the other hand, female sex is related with lower costs.

A5142

Cost efficiency of bariatric procedures

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Introduction: Bariatric surgeries aim to improve patient's health by promoting weight loss, metabolic change, psychological wellbeing and morbidity resolution. As such, multiple factors can be used as success-measures after bariatric procedures. The purpose of this study is to analyze the cost-effectiveness of bariatric procedures in terms of BMI reduction per surgical cost. For this, we have performed an analysis where we study weight loss up to 2 years after surgery and contrast it with total surgical expense of the hospital course of a bariatric patient.

Methods: A retrospectively reviewed was performed to include all primary laparoscopic sleeve gastrectomies (LSG) or primary laparoscopic Roux-en-Y Gastric bypasses (LRYGB) from 2013 to 2014 at our institution. For the identified patients BMI measurements were collected from surgery day up to 2 years after the procedure. The multivariable model for the cost-effectiveness outcome was fit using generalized least squares to account for correlation due to repeated measures and heteroskedasticity. The correlation structure was assumed to be compound symmetric. The main effects included in this model included a linear term for the effect of baseline BMI, a term for procedure type, and a restricted cubic spline term for time (months from the index procedure). The interaction term between the effects of procedure type and time was also included. Predicted values of the cost-effectiveness outcome were computed at 1 and 2 years for each procedure and comparisons between procedures were made at each of the time points; no correction of multiple comparisons were made. All analyses were done using R version 3.2.3 (2015-12-10).

Results: A total of 458 procedures were included in the study, 65 underwent LRYGB and 393 LSG. Based on the model of the cost-effectiveness outcome, fixing pre-operative BMI at 42.5 we might predict at 1 year values of 1.36 (95% CI 1.31 - 1.41) and 0.99 (95% CI 0.88 - 1.1) units of BMI reduction per \$1,000

spent, for LSG and LRYGB procedures, respectively. At 2 years we predict values of 1.23 (95% CI 1.16 - 1.31) and 1.09 (95% CI 0.91 - 1.26) units of BMI reduction per \$1,000 spent, for LSG and LRYGB procedures, respectively. Comparing the LSG procedure to the LRYGB gives differences in cost-effectiveness outcome of 0.37 (95% CI 0.25 - 0.49) and 0.15 (95% CI −0.04 - 0.34) at years 1 and 2, respectively.

Conclusion: This analysis of this metric of cost-effectiveness suggests some advantage to using the LSG procedure, though this advantage seems to lessen in the second year. Laparoscopic Sleeve Gastrostomies promotes weight-loss at a lower cost than LRYGB.

A5143

The role of Age in weight loss pattern after bariatric surgery

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Background: There is conflicting evidence regarding age as a determinant factor of postoperative excess weight loss. The aim of this study is to evaluate the influence of age at the moment of surgery as on postoperative weight loss.

Methods: From December 2010 to November 2014, 1133 patients underwent bariatric surgery at our institution. Of these patients, 158 patients (13.9%) were 65 years or older. Outcomes in terms of perioperative complications, short-term and long-term weight loss were extracted from our data base and compared to a control group of less than 65 years of age. To adjust for difference in the preoperative risk factors between these two groups, we developed a statistical model to clarify the impact of patient age at moment of the surgery on the postoperative weight loss in terms of BMI.

Results: Older patients have more preoperative comorbidities than younger patients (Hypertension 59% vs. 92%, $P < 0:001$; Sleep apnea 45% vs 60%, $P < 0:001$; Diabetes II 68% vs 76%, $P < 0:001$; Dyslipidemia 38% vs 65%, $P < 0:001$). In addition to this, preoperative BMI of older patients was lower than younger patients (42 kg/m² vs 39 Kg/m², $P < 0:001$). Procedure-related complications are similar between the two groups. At 12 months post-surgery,

older patients had lost 50% Excess BMI Loss compared to 59% in the younger group ($P = 0.71$). At three years, the results were 64% versus 53%, respectively with ($P = 0.091$). According to the model, if both groups started with the same BMI, the younger group would have a lower BMI at 1 year after surgery but very similar BMI at 3 years (image1).

Conclusions: Younger and older patients lose weight at a different pace. Although weight loss in the first year after surgery is greater in younger patient, after three years all patients show a similar final BMI. This may be a reflection of a different metabolism or adherence to the post-surgical treatment. Bariatric surgery is an effective way to lose weight regardless of the age.

A5144

Early Weight Regain: A single institution experience

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Introduction: Despite the benefits of bariatric surgery, early weight regain represents an important challenge for surgeons and bariatric patients. This problem appears to be multifactorial due to etiologies that are complex and frequently overlap. The aim of this study is to review the experience of a single institution in regards to early weight regain after bariatric surgery. It also provides a thorough review of the literature on strategies how to prevent weight regain and promote weight loss maintenance.

Methods: After Institutional Review Board (IRB) approval and following Health Insurance Portability and Accountability Act guidelines, we conducted a retrospective review of a prospectively collected database of all the patients who underwent bariatric surgery as a final approach for morbid obesity. Demographic data as well as early post-operative results were collected. The follow up visits were scheduled at 2 weeks, 1 month, 3 months, 6 months, 1 year, 1.5 years, 2 years and then every year for all patients. BMI changes over time were recorded and compared between populations. Bariatric procedures were divided in 4 categories: laparoscopic gastric banding (LGB), laparoscopic sleeve gastrectomy (LSG), laparoscopic Roux-en Y gastric bypass (LRYGB), and revisional procedures (REV). A review of the existing literature was

performed to describe current strategies for long term control of weight a reduction of weight regain.

Results: We studied a population of 1133 patients, 975 patients under 65 (86.1%) and 158 patients \geq 65 (13.9%). Forty-three patients (3.8%) underwent LGB, 643(56.8%) LSG, 279(24.6%) LRYGB, and 168(14.8%) REV. Figure 1 presents the estimated BMI as a function of time if all patients were to start at a BMI of 40 kg/m². We can observe how primary LRYGB promotes the most weight loss while bands and revisional surgeries are at the other end of the spectrum. Primary LSG has similar results to LRYGB but with inferior weight loss. In our experience most of the weight is lost during the first 2 years after surgery but in most cases there is certain level of regain later on.

Conclusion: Bariatric surgery promotes significant reduction of excess body weight but weight regain is observed in some patients after few years. LRYGB leads to better weight loss whereas LAGB and REV do the least. LSG is marginally less effective than LRYGB as far as weight loss concern. In all cases, some level of weight regain is experienced 2 years after the initial surgery, specific care could be established to assess this issue.

A5145

Laparoscopic sleeve gastrectomy: does bougie size affect weight loss?

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Background: Laparoscopic Sleeve Gastrectomy (LSG) has become the most popular bariatric operation worldwide. However the technique lacks standardization. The ideal size of bougie in LSG remains controversial. The aim of this study was to determine the weight loss outcomes based on different bougie sizes.

Methods: We retrospectively reviewed the data from all patients who had undergone primary LSG at our institution between 2004 and 2014. Revision LSG for failed bariatric procedures was excluded. Data including patient demographics, Pre-operative BMI, bougie size, post-operative percentage Excess weight loss (% EWL) were analyzed. Predicted means at 1 and 2 years for each bougie size with associated 95% confidence intervals were computed.

Results: A total of 1166 patients underwent LSG during the 11 year period. 57% Caucasian, 25% Hispanic/Latino, 15% African American, 0.5% Asian and 1% multiracial. The mean preoperative age and the initial BMI was 47 years (SD \pm -10) and 43.4 kg/m² (SD \pm -6.8) respectively. Bougie size 38 Fr was used in 827 (70.9%) patients, of which 64.6% were women. The major comorbidities at the time of surgery included Diabetes (52%) and GERD (40.22%) $p < 0.01$. For the purpose of the analysis we divided the patients in two groups: group 1 -patients who had a bougie of 38 Fr and group 2 - with bougie $>$ 38 Fr. The average Length of Stay of group 1 was 2 days (SD \pm -1) vs. 3 days (SD \pm -1) for group 2, $p < 0.01$. Readmission within 30 days was 8 % (n=70) group 1 and 7% (n= 23) group 2 $p < 0.01$. Post operatively, Anastomotic leak was noted in 1 patient (0%) in group 1 and 2(1%) patients in group 2 (N.S.). Stricture was noted in 3 patients in group 1 (0%) and 2 (1%) in group 2 (N.S). Obstruction was noted in 4 patients (0%) of group 1 and 1 patient (0%) of group 2. New GERD occurred in 51 patients (6%) in group 1 and in 17 (5.1%) in group 2, $p < 0.01$. The predicted BMI and % EWL by bougie size at 1 and 2 years after surgery are shown in the figure.

Conclusions: There is a trend of higher weight loss and decreased de novo GERD with bougie size over 38, however further studies are necessary to draw more definitive conclusions, as the cohort of patient with bougie $>$ 38 was significantly smaller.

A5146

Loss to Follow-up after Bariatric Surgery: Are Lost Patients Doing Better or Worse?

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Background: Bariatric surgery has demonstrated its short- and long-term efficacy regarding both weight loss and resolution of comorbidities. However, most retrospective studies suffer from significant loss to follow-up over time. This study evaluated weight loss and resolution of comorbid conditions for patients who were lost to follow-up (LOST) as compared to patients with complete follow-up (COMP) after bariatric surgery.

Methods: This retrospective study included 1,947 patients undergoing laparoscopic Roux-en-Y gastric bypass (LRYGB) or laparoscopic sleeve gastrectomy

(LSG) between 2000 and 2014 at a single academic institution. Subjects were stratified into two groups: those patients who followed up with their bariatric provider 12 months postoperatively and had at least one additional follow-up appointment thereafter (COMP), and those patients who missed their 12-month visit and never returned to clinic for follow-up (LOST). Demographic and anthropometric data were collected from both groups preoperatively and at 3 and 6 months after surgery. Body mass index (BMI), percentage of excess weight loss (%EWL), and comorbidity status were also obtained. LOST data were obtained by direct patient contact. Continuous and dichotomous variables were analyzed using unpaired-t or Chi-square tests, respectively, or a non-parametric equivalent as appropriate using GraphPad Prism.

Results: 316 of 1,576 LRYGB patients (20.1%) and 106 of 371 LSG patients (28.6%) had no follow-up information \geq 12 months after surgery ($p=0.0003$). LRYGB patients in the LOST group were on average younger and more often non-Caucasian than patients in the COMP group (patient demographics listed in Table 1). Both 3 and 6 months after LRYGB, LOST patients showed significantly lower %EWL than patients in the COMP group: 3 months: 41.5% \pm 0.42 vs. 37.0% \pm 0.94 ($p<0.0001$), 6 months: 61.0% \pm 0.54 vs. 56.1% \pm 1.56 ($p=0.0034$). The LOST group also had a lower rate of T2DM resolution at 3 months postop: 88.2% vs. 74.5% ($p=0.0141$). LSG patients in the LOST group had a significantly higher but clinically similar BMI than patients in the COMP group at 6 months: 33.7 kg/m² \pm 0.36 vs. 35.6 kg/m² \pm 1.13 ($p=0.0424$). The LOST group trended toward lower %EWL at 6 months but failed to reach statistical significance: 55.1% \pm 1.33 vs. 50.2% \pm 2.75 ($p=0.1196$). No significant differences in comorbidity resolution were noted in the LSG group at 3 or 6 months.

Conclusion: Long-term follow up is an important tool for optimization of patient outcomes after bariatric surgery. In this study, patients lost to follow-up comprised 20% of LRYGB patients and 29% of LSG patients. LRYGB patients who failed to follow up at one year lost significantly less weight and had a lower rate of T2DM resolution at their 3-month visit as compared to patients with long-term follow-up. However, while these results are statistically significant, the absolute difference between patients who followed up or failed to follow is clinically insignificant. Future studies should focus on determining the causes of loss to follow-up in order to increase patient compliance with postoperative

visits. Furthermore, these studies should help determine whether the results reported here are causes or consequences of long-term loss to follow-up.

A5147

THE INTEREST OF ENHANCED RECOVERY AFTER SURGERY (ERAS) DURING THE FIRST YEAR OF ACTIVITY IN A NEW BARIATRIC CENTER

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Background: The implementation of a new bariatric program encounters one major limitation the application of standard protocols for enhanced recovery after surgery (ERAS). From its creation (January 2015), the new bariatric department - the American Surgecenter of Abu Dhabi (ASC) - started his activity based on the IFSO/ASMBS Guidelines with a multidisciplinary team, and a surgeon expertise of > 20 years experience in this field and > 3000 major laparoscopic bariatric procedures performed in France. This new bariatric program applied a fast track protocol on per operative time and on post operative rehabilitation.

Methods: Data on all consecutive bariatric procedures performed over 12 months within an ERAS protocol were prospectively recorded. Interventions utilized included short preoperative fasts, decrease operative time, early mobilization and feeding. Data collected included demographics, comorbidities, morbidity, mortality, length of stay (LOS), re-admissions and reinterventions.

Results: Between January 2015 and January 2016, 116 patients underwent a bariatric procedure at The American Surgecenter of Abu Dhabi (ASC). Mean age was 34,6 years (16-61) and average BMI was 41,7 (32-72,2). 60 % were women and 37 % of patients had at least one comorbidity (diabetes type 2, high blood pressure, hyperlipidemia or sleep apnea). 94 % of the procedures were Sleeve Gastrectomies, 2.6 % were Gastric By Pass, and 3.4 % band removal. The mean operative time was 20 min for a sleeve gastrectomy (14-45 min) and the average hospital stay was 1.2 days (0.9-3.3). The rate of complications was 1,7% with one post operative hematoma drained by CT scan on postoperative day (POD) 14 after the surgery and one relative stenosis endoscopically dilated at POD 45. No reoperation was done. No leak and no mortality were recorded.

Conclusion: Applying an ERAS protocol was feasible, safe, associated with low morbidity, reduced LOS and re-admission rates. The beginning of a new bariatric program should not preclude use of an ERAS protocol within bariatric patients.

A5148

Assessment of weight loss after bariatric surgery using individual deviations from multivariate model predictions.

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Background: Bariatric surgery is commonly reported to result in sustained loss of 60-80% of excess body weight. In addition, patients report amelioration of other obesity-related comorbidities such as diabetes and cardiac dysfunction after surgery. Although bariatric surgery presents a promising strategy to improve metabolic disease, not all patients exhibit long-term responsiveness to surgical intervention. Summaries of the literature consistently demonstrate that 15-30% of patients exhibit significant weight-regain and increased food intake 2+ years after the surgical procedure. Psychosocial and cognitive factors may explain this underlying variance.

Methods: A prior study by one co-author created an analyzable dataset using the Bariatric Outcomes Longitudinal DatabaseSM by Surgical Review Corporation. Potential predictor variables included all available descriptors of the procedure, patient demographics, co-morbidities, and prior surgical history. Linear regression models of weight and %BMI loss were fitted for 12, 18, and 24 month endpoints. In the present study, a subset of ~100 patients that fall into 'high responders' (HR) and 'low-responders' (LR) to surgical weight loss intervention were identified. These individuals represent the extremes of the weight-loss distribution, with HR losing the most weight and LR losing the least. We applied our previously published linear regression model, including several key predictor variables to these subsets of patients for post-hoc identification of pre-surgical characteristics that co-vary with amount of weight lost.

Results: We predicted that the inclusion of more detailed psychological variables would add significant predictive value to multivariate models explaining variability in weight loss after bariatric surgery expressed as deviation from the expected

outcomes. Analyses on potential new key predictor variables (e.g. scores on the Binge Eating Scale, Hospital Anxiety and Depression Scale, SMAST, EAT-26 and standard scales for depression, alcohol consumption and anxiety) using variable of interest as the predictor and residual scores as the dependent variable, will be discussed within the context of patient individual differences.

Conclusion: Although bariatric surgery presents a promising strategy to improve metabolic disease, not all patients exhibit long-term responsiveness to surgical intervention. Psychosocial and cognitive factors may account for some of this underlying variance. Most importantly, continued identification of these variables potentially provides patients and surgical treatment teams valuable information to inform education and intervention designed to enhance long term outcomes.

A5149

Opportunities for Education and Training in Bariatric Surgery: A Systematic Review. Alhabdan S, Alamri H, Aggarwal R

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Introduction: Bariatric surgery has quickly become one of the commonest surgical procedures performed in North America. It is a technically challenging speciality that entails a long learning curve. Surgeons in this field are either not formally trained, undertook mini fellowships or were involved in dedicated fellowship training programs.

Objective: To perform a systematic review of educational programs, opportunities and structures, with respect to outcomes in bariatric surgery.

Methods: An electronic search was performed in three databases (PubMed, Medline and Cochrane library) from 1988 till November 2015. Studies examining all the aspects of bariatric surgery training and education were included. Two reviewers conducted the research independently and disagreements were resolved by consensus.

Results: Some 51 studies were included for review, totaling 154,580 patients. From eight papers, comprising 3524 patients, the estimated learning curve for gastric bypass was median 100 (range of 50 to 500), and mean of 133 patients. The impact of fellowship training on patients' outcome was investigated in 12 studies, which included 131,246 patients. The main determinants of competence

were operative time, immediate and postoperative complications, length of stay and percentage excess weight loss. These showed no significant difference in outcomes between surgeons in fellowship, and those in practice. Nine papers examined the aspects of bariatric training in residency, and involved 18,987 patients, of which 8,459 had resident involvement. The majority of residents were seniors (PGY 4-5), with examination of safety, operative time and complications. A single study showed training residents to be expensive. Non-formal training methods were discussed in four studies, including 483 participants, comprising mini-fellowships, surgical master-classes and workshops. Training durations ranged from 2 days to 6 weeks. Finally, eight studies examined simulation in bariatric surgery (4 of virtual reality, 3 in animal model and one synthetic).

Conclusion: The majority of training of bariatric surgery occurs in the context of fellowship, with no negative impact on patient outcomes. The estimated learning curve for gastric bypass is approximately 100 patients. In addition to formal fellowship, bariatric surgery is also being taught to during residency. Further opportunities exist with regard to mini fellowships, workshops, and the evolving role of simulation.

A5150

Robotic Bariatric Surgery Curriculum for Surgical Training in an accredited MIS and Metabolic Surgery Fellowship Program: Simulation, Video based training and Modular Phased Learning.

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Introduction: In the first decade since its introduction the robotic surgery was primarily restricted to urology and gynecology with general surgery cases constituting a small fraction of infrequently performed, foregut surgical procedures and colorectal procedures. We hypothesized that frequently performed procedures, such as Roux-en-Y gastric bypass & sleeve gastrectomy will be an ideal training platform for a Minimally Invasive Surgery (MIS) Fellowship program. The robotic platform skills learned from performing these bariatric procedures on a frequent basis will reduce the

fellow's learning curve for less frequently performed foregut and colorectal operations.

Materials and methods: A curriculum was developed and implemented for the academic year 2015-2016, in a Fellowship Council accredited program. The fellow completed multiple online robotic surgery training modules at www.davincisurgerycommunity.com, as well as 3D simulator training on the robotic console. The successful completion of the online module was followed by a 'clinical assist phase' where the fellow was the assistant surgeon, learning the proper port placement, docking, and troubleshooting common issues with the equipment, instruments, and patient positioning. The fellow was also required to watch and edit operative videos. The next module 'clinical console limited surgeon phase', the fellow was allowed to perform increasingly complex portions of the bariatric surgical operation, e.g. jejuno-jejunostomy, gastro-jejunostomy, short gastric vessels & greater curvature ligaments division, stapling of the stomach and suturing of the divided omentum to the sleeve. Finally, a 'clinical console primary surgeon phase' was completed where the fellow performed each entire operation. Similar step-wise and graduated 'console phase' was utilized for foregut, colorectal and other operations after preliminary bariatric operations. The fellowship Council mandated technical skill component assessment as well as quarterly assessment was obtained from all the attending surgeons and was utilized to evaluate progression of the fellow.

Results: The fellow obtained triple certification in minimally invasive, robotic, and bariatric surgery. From July 1, 2015 to May 9, 2016, of the fellow's 414 total operations, a total of 142 robotic cases were completed, including 60 (42%) initial or revision bariatric operations, 37 (26%) general, 25 (18%) foregut and 20 (14%) colorectal operations. At the time of graduation, through review of quarterly evaluations as well as technical evaluation by all surgical proctors, the fellow was facile with robotic bariatric, general, and colorectal surgery, completing 45 (32%) of the robotic operations as the first assist or proctor, and 97 (68%) as the primary console surgeon.

Conclusion: Standardized educational pathways utilizing bariatric cases as training modules enable an MIS fellow to obtain an extensive experience and certification in all forms of robotic bariatric and general surgical operations. **Acknowledgement:** This study was supported by a grant from the Foundation for Surgical Fellowship.

A5151

Implementing an Inter-Rater Reliability Process to Improve Data Accuracy

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Background: The Metabolic and Bariatric Accreditation and Quality Improvement Program (MBSAQIP) provides accredited programs with a set of standards with which all participating programs must comply. These standards help programs achieve and maintain accreditation, and drive consistency in program operations and services nationally. Accredited programs are required to abstract data from 100% of bariatric cases into the MBSAQIP Data Registry. This platform provides qualitative and quantitative feedback to participating programs via adjusted and unadjusted reports, which can help programs isolate performance areas which necessitate improvement. Additional standards exist regarding data integrity, such as Standard 6: Data Validation, whereby programs are required to intermittently submit administrative or other corroborating data as an audit of data entered. This standard is primarily met during the accreditation site visit during one-on-one discussion between the site surveyor and the Surgical Clinical Reviewer (SCR). The SCR manages case entry on 100% of bariatric cases and indefinite follow-up on a constantly increasing census of patients. Per MBSAQIP standards, the number of SCRs at a site should be proportional to the site's annual case volume, with one additional backup SCR assigned if necessary. Many SCRs work in an environment with minimal face-to-face accessibility to their surgeon champions, some even work off-site or remotely, and thus must function highly autonomously. For a new SCR, or one with limited backup resources, this expectation can be overwhelming. Anecdotally, there is a desire for earlier and more frequent audit process outside of the rigor of the site visit to help build the self-efficacy of the abstractor, particularly during the initial phase of their tenure in the role. In order to comply with data validation standards, enhance accuracy of the collected data, and build SCR self-efficacy, our program has implemented an Inter-Rater Reliability (IRR) process to ensure accuracy of the data collected by any abstractor in the Registry.

Our experience implementing IRR at a high volume, acute care teaching hospital is presented here.

Methods: *Design* Methodology for IRR was drafted by the Metabolic and Bariatric Coordinator (MBC) and SCR, and approved by all team members. Criteria were defined for the number, type, and frequency of cases selected for auditing, as well as specific elements to be audited. Once the methodology was confirmed, a spreadsheet was constructed to track agreement with elements in each section of the Registry and overall (Figure 1). The spreadsheet was designed for simplicity and ease of use for multiple users. The number of total elements audited is indicated for each section and the rate of agreement for that section is automatically calculated based on the value entered by the auditor. For example, if the original abstractor successfully entered 5 of the 6 demographics elements, 83% would populate for that section. In addition to section scores, total scores are calculated as averages of the section scores. IRR agreement rates are reported routinely during Metabolic and Bariatric Surgery Committee (MBSC) meetings as a real-time quality indicator. *Workflow* Our site has one SCR and one backup; cases entered by the primary SCR would be audited by the backup SCR, or other designee, and vice versa to ensure no self-auditing. IRR case selection indicates that 3-4 cases will be audited per month, ideally capturing at least one of each type of surgical procedure if available, including revision cases. Based on our average monthly surgical volumes, this represents roughly 10% of cases. The auditor selects a sampling of cases based on the predefined guidelines then abstracts the case onto paper. The auditor's copy is compared to the Registry case data entered by the original abstractor. Discrepancies are indicated on the form and in the spreadsheet, reviewed by both parties, and the paper copy is signed and stored as documentation for the site visit. Any incorrect data should be modified in the Registry if lock-out dates allow, and any continuous issues are discussed with the MBC to confirm and improve the process of abstraction.

Outcomes: Our site's IRR process has evolved to match changes to the Registry workstation, and involves auditing 106 elements from the Registry Case Form. Average rate of agreement is 99.25% over 4 years, which has trended slightly upward over time, as the process has allowed us to identify elements that were not abstracted consistently between abstractors. In our experience, some inpatient elements such as anesthesia classification

are located in multiple places in the chart and are often inconsistent. Through IRR, we have been able to identify discrepancies like these in order to improve.

Conclusions: Data validity and reliability are of paramount importance to any large data repository, and this process augments the Registry's built-in validation functionality. Overall, implementation of the IRR process at our site has provided opportunity to validate abstraction accuracy in advance of the site visit, as well as fulfilling data validation standards.

A5152

Ditching the dieting mentality: Infusing body positivity into bariatric surgery programs

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Many patients expect that bariatric surgery will improve body image. In fact, dissatisfaction about weight, shape, and overall appearance is second only to health concerns among primary motivations for pursuing bariatric surgery (Libeton et al., 2004). Although patients largely report increased confidence and improved quality of life after surgery, body image concerns among postsurgical bariatric patients are not uncommon (Alegria & Larsen, 2014). These body image concerns can be attributed, in part, to patients' dissatisfaction with excess skin following significant weight loss (Kinzl, Traweger, Trefalt, & Biebl, 2003). Another possible explanation is that poor body image is connected to weight-based stigma and a heavy emphasis on thinness and dieting in mainstream US culture. Patients seeking bariatric surgery have tried several diets (i.e., an average of 10), with only minimal long-term successes (Gibbons et al., 2006). Fad diets typically encourage a mentality characterized by a negative self-image and a desire for a 'quick fix,' often involving feelings of deprivation, followed by feelings of failure when diets ultimately lead to short-term weight loss and subsequent regain. After years of 'yo-yo dieting,' it may be difficult for bariatric patients to reject the dieting mentality in favor of focusing on small, manageable lifestyle changes, intuitive eating, and self-compassion. Further, if negative self-image prompts pursuit of bariatric surgery, one would expect that it could remain even after significant weight loss, thus explaining poor body image for some. In direct opposition to mainstream weight stigma and idealization of unrealistic beauty standards, there

has been a growing movement toward 'health at every size' attitudes in recent years. This movement embraces body diversity, rejects the dieting mentality, and encourages people to make peace with their bodies by finding ways of eating and moving in enjoyable and compassionate ways (e.g., Bacon, 2010). On the surface, it would seem that body positivity movements would be at odds with weight loss treatments, including bariatric surgery. However, they need not be mutually exclusive. This presentation will propose an alternative approach to framing bariatric surgery in a manner that recognizes patients' desires to improve quality of life and reduce health risks associated with obesity, while simultaneously fostering a culture of non-judgement, self-compassion, and body positivity at any size. Using the presenter's bariatric center as a case example of how this philosophy can be successfully infused into weight loss treatment, the presenter will discuss strategies for ensuring providers do not perpetuate weight stigma nor create unrealistic expectations of perfect adherence. Focusing on implications for clinical practice, the presentation will further cover how to address unrealistic weight loss goals, eschew the dieting mentality, foster an attitude of self-kindness, reduce shame, encourage intuitive eating approaches, and improve body image both before and after surgery.

A5153

Body Composition Post Sleeve Gastrectomy

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Abstract Background: Sleeve gastrectomy (SG) is currently the most widely performed procedure for the treatment of obesity. SG leads to significant weight loss as well as a reduction in weight related comorbidities. It has been shown that rapid weight loss after bariatric surgery (BS) leads to changes in body composition. However, these changes are not well documented in the early stages post SG when the greatest change in weight occurs.

Objective: To identify changes in body composition in the early stages post SG. **Setting:** Eviva Bariatrics, Seattle, WA

Methods: Demographics were gathered for all patients who underwent a SG procedure at Eviva

Bariatrics and that also underwent pre and post-operative biometric testing. Changes in fat free mass (FFM) and fat mass (FM) as well as body fat percentage (BF %) were measured using the BodPod. Testing took place on average 74 (37-136) days postoperatively. Testing protocols were followed according to the BodPod guidelines. All testing was done at the same facility and machine to ensure accuracy.

Results: Sixty one SG patients from Jan 2014 to April, 2016 underwent biometric testing. They lost an average (avg) 39.9% of their excess body weight (EWL) and 15.2% of their total body weight loss at 74 (37-136) days post op. BF% on average dropped from 49.4% to 45.0%. Patients on average lost 27% of their FFM by 74 days. Three patients (4.9%) maintained or increased their FFM post op. Six patients (9.8%) lost more FFM than fat mass (FM) leading to an increase in BF%.

Conclusion: The goal of BS is to reduce weight and weight related comorbidities. However, reduction in weight alone is not sufficient to accurately assess a patient's success post SG. Patients that are losing more FFM than FM need to be identified in order to be successful post BS. Achieving a healthy body composition, rather than just losing weight, should be prescribed to patients. Future studies identifying the factors that influence FFM preservation are needed, as well as long term body composition results in the SG population.

A5154

Improving Follow-Up After Bariatric Surgery

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Background: Bariatric surgery has persistently been proven to be an effective treatment for morbid obesity and its associated co-morbid medical conditions. The Mercy Bariatric Center of Excellence in Darby, PA cares for a primarily African American and publically insured (Medicare or Medicaid) patient population that is significantly different than has been previously examined in the literature. Analysis of weight loss outcomes in our patients has demonstrated adequate but inferior weight loss in African Americans and in patients with publically funded insurance when compared to those with private insurance.[i] Our practice also loses more patients to follow up (54% at six months

postoperatively and 20% more at one year) than is quoted in the literature.[ii] This study examines the reasons for loss to follow-up after surgery among our patients.

Methods: To examine the inferior rates of follow-up in our bariatric surgery patients and the reasons for decreased weight loss outcomes in African American and publically insured patients, we identified forty patients who underwent bariatric surgery from August 2014 - April 2015 who failed to follow-up with their surgeon more than three months post-operatively. We were able to contact twenty-one of the 40 patients over the phone and they all agreed to participate in a 15-minute telephone survey. The remaining 19 patients were either not reachable by phone (due to out of service numbers or failure to pick up) or unable/unwilling to participate. The survey included 22 questions about planned versus actual weight loss, satisfaction with those outcomes, post-operative dietary and exercise regimens, support group attendance, and the perceived value of the education provided in preparation for surgery. We also queried the frequency of follow-up with bariatric surgeon, PCP, and other medical specialists, and the reasons for failure to follow up.

Results: Ninety percent (19) of participants were female and 71.4% (15) were African American, which is similar to our overall patient population. However, only 42% (9) were publically insured, which is significantly lower than our overall patient population (nearly 60% Medicare or Medicaid). Fifty-two percent of patients (11) were satisfied with their weight loss, while 48% (10) were either unsatisfied or satisfied but wanted to lose more. Overall, 62% (16) felt that they were well educated about their surgery preoperatively, and 76.2 % (18) felt that nutrition education was the most important component of the preparation. Of the 21 patients interviewed, 16 (76.2%) exercised, 18 (85.7%) felt they maintained a healthy diet after surgery, and only two patients sought other weight loss solutions following inadequate post-surgical weight loss. Although these patients failed to follow-up with their surgeons as frequently as recommended, 90% (19) did see their primary care physician (PCP) routinely. Patients failed to follow-up with their surgeons postoperatively because of an inability to access office hours due to work/school/child care conflicts or distance (76.2%) and a lack of understanding of the need for long-term follow-up and/or the sentiment that follow-up was unnecessary due to a lack of complications (95.2%).

Conclusions: A significant number of patients that fail to follow-up with their surgeon in the long-term fall short of their weight loss goals after surgery, and many of them desire to continue losing weight but do not have the tools to implement further weight loss. This survey showed that the following interventions should be used to improve post-operative follow-up: increased surgeon interaction with PCPs and referral back to the surgeon, more flexible office hours and/or locations of the surgeons, and pre- and post-operative education about the necessity for long-term follow-up. In addition to increasing surgeon specific follow-up, the use of support groups and information sessions with a nutritionist exclusively for post-operative patients would improve weight loss outcomes. Regular and long-term follow-up with bariatric surgery specialists after surgery will improve weight loss outcomes, and help to prevent weight gain.

LA Karas, M Siddeswarappa, S Slane, P Ramachandra.

Insurance status influence weight loss and complication rates following bariatric surgery.

Abstract presented at SAGES 2015, Nashville, TN. [ii] J Harper, AK Madan, C Ternovits, DS Tichansky.

What happens to patients who do not follow-up after bariatric surgery? *Am Surg* 2007 Feb; 73(2):181-4.

A5155

Body Composition of Asian Patients with Morbid Obesity seeking Bariatric Surgery

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Background: Currently, there is a lack of available information on the body composition characteristics of Asian patients with morbid obesity seeking bariatric surgery. The objective of this study is to evaluate the body composition profile of these patients and examine its relationship with ethnicity and diabetic status.

Method: A total of 305 bariatric patients were measured pre-surgically with the body composition analyzer, GAIA 359 PLUS, which utilizes bioelectrical impedance analysis to estimate the body's make up.

The data collection included total body weight, body mass index (BMI), excess weight, basal metabolic rate (BMR), fat-free mass (FFM), fat mass, fat percentage and total body water (TBW). Two subgroup analyses (Diabetic versus Non-Diabetic and between the Chinese, Malay, Indian, and Eurasian ethnic groups) were performed to see if there were any differences between the groups for the different body composition variables. The two sample t-test was used to compare the mean body composition variables of diabetics and non-diabetics in the sample, while the F-statistics from simple linear regression was used to compare mean body composition between the different ethnicities. Statistical significance was set at $P < 0.05$. For each of the body composition variable, the mean (SD) was reported.

Results: Subjects in this study had a mean BMI of 42.7kg/m² (7.4) and a mean BMR of 1596kcal (326.3). The mean fat percentage, fat mass and FFM were 42% (8), 48.6kg (13) and 67.5kg (17.9) respectively. Fifty nine percent of the subjects were females and had a mean age of 41.7 years (10.6) while the males subjects were slightly younger with a mean age of 36.5 years (11.5). Ethnic Malays form bulk of the group (38.7%) followed by Chinese (28.2%), Indians (24.9%) and Eurasians (8.2%). Malays have the highest mean BMI 45.1kg/m² (7.8) followed by Eurasians 42.2 kg/m² (5.6) while the Chinese and Indians were similar at BMI of 41kg/m² (SD: 6.6 and 7.1 respectively). Despite having a similar BMI, the mean fat percentage of Chinese was lower in comparison to Indians (39.4% vs. 43.8% respectively, $P = 0.003$). Additionally, mean FFM and TBW in Chinese was higher than in Indians (72kg vs. 63.8kg, $P = 0.031$ and 52kg vs. 46.1kg, $P = 0.028$ respectively). Lastly, Chinese were found to have a higher BMR of 1716.6kcal (334.6) as compared to Malay who had the lowest BMR at 1542.7kcal (313.5). Non-diabetic subjects ($n = 213$) had a mean of 6.2 absolute percentage point greater FFM ($p = 0.003$) and a mean of 5kg heavier TBW ($p = 0.003$) as compared to diabetic subjects ($n = 92$). In line with the result for FFM, mean fat percentage was lower for non-diabetics [41.4% (8.3) vs. 43.4% (7.3), $P = 0.016$]. In addition, mean BMR was 114.8kcal higher ($p = 0.004$) for the non-diabetic subjects. Despite the differences in fat percentage, FFM, TBW and BMR, the diabetic group was significantly lighter than the non-diabetic group [111.9kg (20.9) vs. 118.7kg (25.3) respectively, $P = 0.016$]. The interaction effect of diabetic status and ethnicity was not looked at for the different body composition

variables, due to the small sample size of each stratum.

Conclusions: The Chinese ethnic group has a more protective body composition profile. Malays have the highest weight, BMI, percentage of fat and the lowest BMR, which are high risk factors of metabolic diseases. Despite Indians and Chinese having similar BMI, Indians have a higher percentage fat and lower FFM and thus a theoretically higher risk of developing metabolic syndrome.

A5156

Best practices for Real-Time Data Management Workflow using MBSAQIP

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Background: The healthcare industry is in the midst of substantive transition from a volume-based model to a value-based model, with patients seeking out facilities based on outcomes and safety much like consumers of other services. Additionally, changes in hospital reimbursement have made it necessary for programs to publicly report outcomes as well as implement quality improvement initiatives in order to maintain viability in an increasingly competitive quality-driven market. The Metabolic and Bariatric Accreditation and Quality Improvement Program (MBSAQIP) has provided accredited programs with a standardized Registry through which they are able to monitor safety and quality indicators such as readmissions and complications. This platform has a high level of functionality and provides quantitative feedback to participating programs via the Semi-Annual Report (SAR) and other reports. These data help programs identify areas with potential for quality improvement. In order to provide as much real-time data as possible to centers, MBSAQIP has reduced the amount of time available for the abstractor to complete each case. This has presented a unique challenge to programs whose data entry workflow was not concurrent. As our center was chosen to participate in the Decreasing Readmissions Through Opportunities Provided (DROP) initiative, we were in a position to enhance processes by developing and implementing a concurrent data entry and review process. Our experience at a high volume (>500 annual cases), acute care teaching hospital in developing best practices with real-time case management and

tracking using the MBSAQIP Registry in conjunction with other applications is presented here.

Methods: *Workflow* Our program utilizes multiple tracking systems to augment the Registry and allow for the target 100% case capture required for accreditation. Preoperative surgical pending lists are circulated to the abstractor on a weekly basis, and all new bariatric cases are entered into a spreadsheet which is used to track entry of each case, 30 day follow-up completion, and other procedure and scheduling specific information. Cases are entered into the Registry within 2 weeks of surgery and then marked complete in the spreadsheet. All surgical cases are revisited following the 10 week post-surgical visit where post-discharge information is entered and the case is closed. This practice allows the abstractor to touch the case as few times as possible, while still giving a second opportunity to review any case documents which were not available immediately after surgery, and promotes early intervention on patients who are non-compliant with follow-up. *Applications* The primary application used by our program to supplement the Registry is Microsoft Excel. Functions such as VLOOKUP and Pivot Tables allow for utilization of the Registry's raw data for comparison with the MBSAQIP pre-set reports, the SAR, and as a standalone reporting system to track elements the Registry does not capture such as the admit route or other custom variables. Other applications utilized include: 1) our inpatient hospital electronic health record which generates alerts for bariatric patients from our program who are readmitted to the facility, 2) a hospital based listserv of 30-day readmissions across all specialties, and 3) internal team communication with the providers regarding add-on, transfer, or complex revisional cases. *Communication* After receiving the surgical pending list, any non-bariatric procedure (e.g., hernia repair, anastomotic repair) performed on a patient with history of bariatric surgery is reviewed and placed into a template for circulation to the surgeon champions for their input on case inclusion with supporting rationale (CPT code, documentation suggesting inclusion/exclusion). These discussions occur routinely, during scheduled meetings or via email, and help to keep the surgeon champions abreast of the complexities of the Registry, and any gaps in clinical understanding the abstractor may have. Through this process, our program has been able to develop decision-making algorithms for complex cases to help guide the abstractor on similar cases in

the future, saving surgeon time and building abstractor self-efficacy.

Outcomes: Implementation of these processes has allowed our program to continuously monitor all aspects of patient outcomes, allowing for more timely quality improvement interventions. This information then augments the SAR and other reports. In our experience, best practices for utilizing the Registry for real-time data reporting include increased transparency and communication with team members by obtaining consensus on less straightforward case inclusion criteria, occurrence determinations, and final diagnoses for readmission/reoperation. Data has supported our continued efforts to improve case capture (Figure 1). Comprehensive tracking spreadsheets allow for quick, though unadjusted, data analysis which is a requirement for accredited programs, and most importantly, provide a method for cross comparison and reconciliation of data with the Registry. Our program has found that an advanced understanding of Excel is an invaluable asset for the abstractor role in order to review and interpret both unadjusted and adjusted reports. Overall, increased efficiencies have resulted in more time for the abstractor to analyze data, shifting from retrospective data review to prospective, real-time data monitoring.

A5157

Intraoperative Leak Test During Sleeve Gastrectomy is of No Value

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Background: Intraoperative leak tests are routinely used to evaluate for leak; however, the utility and the sensitivity of the tests have recently been questioned, and the tests have been shown to be of no value in diagnosing current leaks or predicting subsequent leaks in recently published studies. The practice of routine intraoperative leak testing may be unnecessary during routine sleeve gastrectomy.

Methods: A retrospective study was designed using a prospectively collected database of five bariatric surgeons in one private practice performing surgeries at three community hospitals in Upstate NY. All patients who underwent sleeve gastrectomy or single stage Lapband removal and concomitant sleeve gastrectomy from January 2011 to December 2015 were included. The intraoperative leak testing

was in the form of 60 ml of methylene blue solution being instilled into the stomach via an oro-gastric tube placed after the completion of the sleeve gastrectomy, with the distal stomach being manually obstructed, with visual confirmation of distension. A total of 2082 sleeve gastrectomies were included; all were laparoscopic (100%). Routine intraoperative leak tests were performed in all patients.

Results: There were no leaks demonstrated by the intraoperative leak test. There were no leaks presenting within 30 days after surgery (0%). There was one patient presenting with a leak or a perforated ulcer in the proximal portion of the stomach at 76 days postoperatively. The patient's intraoperative leak test was negative, and the patient's postoperative UGI obtained 5 days after surgery showed no evidence of extravasation. The patient had a history of binge eating disorder and also continued to smoke during the postoperative period.

Conclusion: The routine intraoperative leak test is of no value in diagnosing leaks or predicting potential leaks in sleeve gastrectomy in routine cases without technical issues.

Discussion: The primary reason that bariatric surgeons continue the practice of routine intraoperative leak tests is purely medicolegal and not based upon evidence regarding the true utility and sensitivity of the tests. Recent studies have demonstrated the absolute lack of sensitivity of the tests in demonstrating a leak or in predicting a future leak. Our study corroborates the uselessness of the intraoperative leak test, as other recent studies have demonstrated.

A5158

EFFECTIVENESS OF WEIGHT LOSS IN OVERWEIGHT AND OBESE SINGAPOREAN ADULTS: A COMPARATIVE STUDY OF NON-SUPERVISED EXERCISE VERSUS SUPERVISED EXERCISE PROGRAM

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Background: Obesity is a chronic and debilitating disease. One in nine (10.8%) Singaporean adults aged 18 to 69 are obese with a Body Mass Index (BMI) of >30kg/m² and 23.0% fall in the high risk BMI category for Asian body type (BMI>27.5 kg/m²).

Despite several weight management programs in Singapore, individuals fail to commit structured programs due to work commitments, cost, lack of motivation or time. The study aimed to investigate the effectiveness of weight loss in overweight/obese Singaporeans exercising without supervision at home versus those in a supervised weight management program conducted by a physiotherapist.

Methods: A retrospective investigation of 20 patients each from the Weight Management Program (WMP) and Home Exercise Program (HEP) was conducted. The WMP group had 12 supervised exercise sessions. These sessions consisted of aerobic and strengthening exercises for 60 minutes, 2-3 days a week, at an intensity of 50-85% targets heart rate. The HEP group exercised independently at home after a physiotherapy consultation. Both groups were followed up at 1-4 months. Weight (kg), BMI (kg/m²), Fat percentage (%), and Fat Free Mass (FFM) (%) were measured. Secondary outcome measures included exercise duration and exercise behavior as measured using 'Stages of Change' approach.

Results: There was a significant change in BMI (1.6+-1.9kg/m²,p=0.001), fat percentage (1.8+-3.6%,p=0.039) and FFM (1.8+-3.6%, p=0.039) in WMP patients. The proportion of increment in FFM was equivalent to the decrement of fat percentage. This effect was more prominent in those who completed the 12 sessions within 1-2 months (BMI: 1.4+-1.3kg/m², p=0.001; body fat percentage: 1.2+-1.8%, p=0.032; FFM: 1.2+-1.8%, p=0.032) as comparison to those who finished in 3-4 months. For HEP group, weight (2.6+-3.7kg, p=0.006) and BMI (0.9+-1.3kg/m², p=0.005) were significantly reduced. However the proportion of fat percentage and FFM remained unchanged. Significant reductions were seen in BMI (0.8+-0.7kg/m²,p=0.037) and weight (2.2+-2.0kg, p=0.026) at 1-2 months and at 3-4 months follow up (BMI: 1.0+-1.5kg/m², p= 0.039; weight: 2.8+-4.5kg, p= 0.044). For behavior modification post-intervention, 95% of WMP patients were actively exercising at the action stage with the remaining 5% at the maintenance stage whereas only 35% of HEP patients were at the action and maintenance stage. One-way ANOVA showed a significant change in fat percentage (42.6+-8.6, p= 0.008) and FFM (57.4+-8.6,p= 0.008) in WMP at the end of 12 sessions. After 12 sessions of WMP, patients who exercised more than 250 minutes weekly increased to 80% from 5% at baseline. In HEP, 20% of patients reported exercising more than

250 minutes weekly before intervention with no increase in percentage post-intervention. A trend of decrease in BMI was seen in WMP group by multivariate analysis but was not statistically significant.

Conclusion: Supervised, structured WMP was more effective than non-supervised HEP in achieving lower BMI, lower fat percentage and higher FFM but not greater weight loss. Patients in WMP had higher tendency to modify their exercise behavior towards active stage as compared to HEP group and this could result in lower fat percentage and higher FFM.

A5159

Use of an electronic patient tracking system in an outpatient bariatric surgery setting and patient wait times

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Background: Bariatric surgery requires comprehensive care from multiple clinicians including medical assistants, dietitians, nurses, nurse practitioners, residents, and/or attending surgeons, however increasing clinicians during a visit can also lead to longer wait times, negatively impacting patient likelihood of recommendation to others and perception of overall clinical care. The use of electronic patient tracking systems in emergency medicine settings decreases overall wait time, improves communication between providers, and improves patient experience. The full use of an electronic patient tracking system including a clinician tracking function in a multidisciplinary outpatient setting such as gastrointestinal and bariatric surgery is not well understood.

Methods: Patient visits completed at an outpatient gastrointestinal and bariatric surgery clinic in an academic medical center between January 2015 and December 2015 were coordinated using an electronic patient tracking system and retrospectively collected for analysis. Visits were categorized into 2 groups: visit with surgeon or visit with physician extender. Each visit in both groups included at least 2 clinicians (surgeon, physician

extender, nurse, dietitian, surgical resident, medical student, and/or dietetic intern). The clinician tracking function of a provider 'checking in' and 'checking out' of a patient room as a method of following clinicians was used inconsistently throughout this year. Encounters used included new patient visits (NPV), return patient visits (RPV) including pre-operative appointments and appointments > 90 days post-operatively, and post-operative visits (POV) which occurred < 90 days of surgery. Appointments < 10 minutes or > 6 hours and new patient visits with a physician extender (n = 69) were excluded from analysis.

Results: From January 2015 to December 2015, 5505 patient visits were completed (Surgeon Visit n = 2941, Physician Extender Visit n = 2564). For all visits, results of independent samples t-tests show total wait time minutes differed between using the clinician tracking function (M = 9.9, SD = 16.3, n = 4578) and not using clinician tracking function (M = 13.6, SD = 19.9, n = 927) at the 0.001 level of significance ($t = 5.95$, $df = 5503$, $p < 0.001$, 95% CI for mean difference 2.44 to 4.84). Total mean wait time was less for all categories using the clinician tracking function, reaching significance in total surgeon visits, surgeon NPV, total extender visits, and extender RPV ($p < 0.05$).

Conclusions: The use of an electronic patient tracking system is a practical method of coordinating patient visits in an academic medical center's gastrointestinal and bariatric surgery outpatient clinic. Use of the clinician tracking function is associated with shorter patient wait times. More research needs to be done to assess whether implementation of a clinician tracking function decreases wait times and impacts patient satisfaction outcomes.

A5160

Multidisciplinary Committee in the Care of High-Risk Bariatric Surgery Candidates

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Background: Bariatric surgery is the most effective and durable treatment for morbid obesity, however

co-morbidities associated with severe obesity are also associated with increased surgical risk. Multidisciplinary committees (MC) to determine candidacy and develop care plans are common practice for other areas of surgery, but the only published data on MC and bariatric surgery candidates with high-risk psychiatric profiles found as few as 11.2% of those presented undergo surgery¹. Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) center accreditation requires regular reactive committee review of adverse events and subsequent quality improvement but not proactive review of high risk candidates. The use and collateral implications of a proactive MC in a collaborative specialty such as bariatric surgery are not well understood.

Methods: Patients determined to be at higher surgical risk by clinical staff were presented to a monthly MC within a three-hospital bariatric surgery program. The committee included representatives from surgery, nursing, anesthesiology, cardiology, psychology, nutrition, and medicine. Program coordinators also participated, as did other clinical representatives involved in the cases being presented. Records from patients presented between August 2005 and August 2015 were retrospectively collected for analysis. Patients presented for adjustable gastric band removals were excluded from analysis.

Results: Among the 392 patients presented to MC, 19.9% (n = 78) were deemed too high risk to proceed with surgery, 51.8% (n = 203) patients were approved pending completion of additional recommendations, and 28% (n = 111) were deemed appropriate candidates for surgery. Of the 203 patients given additional recommendations, 44% (n = 90) eventually had bariatric surgery, and of the 111 approved to proceed with surgery, 50% (n = 56) had surgery. Of the 146 (37.2% MC patients), 30-day readmission rate of completed cases was 14% (n = 21) and median length of stay was 3.5 days (mean = 4.8, SD $= 6.7$). There were no reported 30 day mortalities or reoperations.

Conclusion: Implementing and maintaining an MC within a multi-site bariatric program is a practical method of determining candidacy and coordinating care for the high risk bariatric surgery patient. The majority of patients presented were required to complete additional recommendations, and more than one third of patients presented underwent surgery. Further studies are needed to determine whether utilizing an MC in bariatric surgery is

associated with decreased operative risk and favorable postoperative outcomes. - Batayyah E, Sharma G, Aminian A, et al. The Role of the Multidisciplinary Conference in the Evaluation of Bariatric Surgery Candidates with a High-Risk Psychiatric Profile. Bariatr Surg Pract Patient Care 2015;10: 156-159."

A5161

Hernia Case Determination: Development of a Rubric for Accurate Data Reporting

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Background: Accuracy of data collection is the foundation of quality improvement. The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) Data Registry provides a platform for programs to report, monitor, and compare their performance and outcomes both internally and externally amongst other accredited programs. Abstracting and interpreting this data is the primary responsibility of the Metabolic and Bariatric Surgery (MBS) Clinical Reviewer. Although the Clinical Reviewer completes initial training and ongoing certification, interpreting and accurately reporting complex technical and clinical information related to surgical procedures presents numerous challenges. In many cases, the need for multiple determinations is required during the data abstraction and entry process, including procedure name and codes, relation to a previous metabolic or bariatric procedure, case inclusion qualification (including remote bariatric patients), revision status, follow-up requirement, and others. Case determination involving hernia repairs in patients with previous metabolic and bariatric surgery exhibits these challenges. Hernia reporting can be complex due to the inclusion of various names for the same type of hernia (e.g., ventral, abdominal, incisional); repairing multiple types of hernias simultaneously; interpretation of procedure codes; use of descriptors (e.g., recurrent, incidental, incarcerated, with volvulus); and explanation of the repair (e.g. reduction, closure, hand-assisted). As the Clinical Reviewer is not surgically trained, a relative lack of knowledge and understanding regarding detailed anatomical specificity and technical surgical language can further compound the matter creating discrepancies in data entry and discomfort in the role. Our experience at a large

volume academic teaching program in developing a rubric for hernia repair classification and reporting is presented here.

Methods: *Classification and Decision-Making* The first step to accurately capture hernia cases was to develop a classification table. Multiple examples from operative note and office visit documentation describing hernia types, surgical repair methods, procedure codes, relation to simultaneous or previous procedures, and other related language were abstracted and organized in a table by likeness. Next, a meeting with the program's surgeons was arranged to review current challenges and develop improvements. An overview of the Registry reporting requirements and points of decision-making regarding data entry related to hernia repairs were outlined. The surgeons answered questions and provided a synopsis of hernia types along with common repair procedures. Specific attention was given to hernias commonly related to previous metabolic and bariatric procedures including those associated with Roux-en-Y gastric bypass (RYGB), trocar incisions, weight-based, and others. The team then examined the list of documentation examples modeling the Registry data entry process. A data dictionary was developed using the current documentation examples along with data entry decisions for each. *Process Improvement* To provide ongoing support, hernia repair cases were added to the team's monthly review process already in place, which included 30-day readmissions, reoperations, and adverse events. Reviews occurred by circulating a list of involved cases with supporting documentation and the Clinical Reviewer's assessment via email or during face-to-face meetings. The intent of this communication was to determine final diagnosis, contributing factors, as well as data entry determinations such as relation to previous metabolic and bariatric surgery, revision status, and others. The time period post-surgery was identified keeping in mind all procedures (related and unrelated) to a metabolic and bariatric surgery are entered into the Registry through one-year follow-up (18 months). In addition, the surgeons agreed to enhance their operative note office visit documentation to provide internal consistency across surgeons and to include details that supported accurate decision-making and data entry for the Clinical Reviewer.

Outcomes: A team approach with surgeon engagement fostered the improvement of Registry data entry and decision-making in regards to hernia

repairs in our patient population by enhancing the understanding of data entry requirements for the surgeons and increased knowledge and comfort level for the Clinical Reviewer. The monthly team review process provided support and guidance in capturing and reporting hernia repair cases in the Registry and highlighted the overall volume and complexity of cases for the surgeons and team leaders. An inadvertent positive outcome was identification of patients who had had previous bariatric and metabolic surgery remotely at other programs. Many of these patients requested official transfer to our program, so case entry and long-term follow-up determination was clarified earlier as well as outcome monitoring. Surgeon understanding of data entry procedures and commitment to consistent and more detailed documentation strongly contributed to accuracy and consistency ongoing. Our process to improve the quality of data reporting for hernia repair classification and data entry decision-making resulted in a standardized approach using the developed rubric. We were additionally able to complete and close cases in a shorter timeframe as a result of these interventions.

A5162

Feasibility for the use of an Anti-Gravity treadmill in bariatric surgical patients

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Introduction: Exercise has been shown to improve metabolic parameters and be an essential adjunct for any weight loss or wellness program. Unfortunately for multiple reasons, patients with Class 3 obesity have reduced exercise capacity. Barriers can include lack of condition, cardiac, pulmonary and muscular skeletal issues such as degenerative joint disease. Technologies that can limit or overcome these barriers would be of great advantage. Anti-Gravity treadmills (Alter- G), that allow the machine to take a percentage of total weight off the individual, have been widely utilized to enhance rehabilitation in athletes with lower extremity injuries. The purpose of this study is to explore their potential utilization in a bariatric surgical cohort.

Methods: 9 patients who met or meet the NIH qualifications for bariatric surgery and with exercise limitations secondary to their obesity and co morbid conditions were referred. 55.5% (5/9) were female

and 44.4% (4/9) were male. Mean BMI was 44.8 and mean age was 61, with an age range of 53-72. They were fitted with zippered shorts that are part of the equipment and attached by the zipper to the treadmill. Following machine calibration, the weight of each patient was reduced by a percentage to result in a BMI of 25. Patients were then allowed to exercise at a comfortable pace for thirty minutes.

Results: All patients were able to be placed into the machine and with supervision complete a 30 minute exercise routine without pain forcing cessation. Multiple patients have begun to use on a regular basis.

Conclusions: Anti gravity treadmills represent a logical approach that can potentially allow patients with Class III obesity to exercise at a brisker pace and without lower extremity pain. Potential applications are for a Prehab or preoperative conditioning program and as a post operative exercise program to enhance weight loss. Further investigation will focus on whether the use of the anti gravity treadmills can result in measurable outcome differences.

A5163

USE OF LIRAGLUTIDE FOR WEIGHT LOSS IN PATIENTS WITH PRIOR BARIATRIC SURGERY

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Aims: Liraglutide, a GLP-1 agonist, was recently approved by the Food and Drug Administration (FDA) for use in the treatment of obesity. A large subset of patients have weight regain after bariatric surgery, but would prefer medical obesity management over revisional surgery. Our study evaluated the efficacy of liraglutide in patients with prior bariatric surgery who experienced either suboptimal weight loss or weight regain after their procedures.

Methods: A review was performed of all patients at our weight loss center who had been prescribed liraglutide for weight loss and had prior bariatric surgery. Patients with <4 months of liraglutide use were excluded from analysis, as this was felt to be an insufficient time period in which to evaluate efficacy.

Results: There were twenty-five patients who met all inclusion and exclusion criteria. Thirteen patients had laparoscopic adjustable gastric bands (LAGB), eight had roux-en-Y gastric bypasses (RYGB), three had longitudinal sleeve gastrectomies (LSG), and one had LAGB over RYGB. Dosages varied from 1.2 mg to

3.0 mg daily of liraglutide, depending on insurance approval and patient tolerance. Average weight prior to therapy was 237.69 lbs and average body-mass index (BMI) was 39.22. Patients showed a significant weight loss at 16 weeks (230.36 lbs, $p = .002$), 20 weeks (228.02 lbs, $p < .0001$), and 24 weeks (215.2 lbs, $p < .0001$). BMI was significantly reduced at 24 weeks as well (35.29, $p < .0001$).

Conclusions: Medical weight management with Liraglutide may be an effective alternative treatment in patients with prior bariatric surgery.

A5164

THE EFFECTS OF COMMUTING ON OBESITY

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Aims: Physical inactivity is proven to be correlated with obesity. Our study aim was to evaluate the relationship between commuting mode/duration and % body weight lost (%BWL) before and after weight loss intervention. Our hypothesis was that longer and inactive commuting would correlate with both a higher baseline body mass index (BMI) and lower %BWL.

Methods: We collected patient commuting data from October 2015 to March 2016. Data included

Conclusion: Commuting time and duration do not appear to have an effect on patient obesity. However, those with an active mode of commute were able to show greater weight loss after intervention.

A5165

Fall prevalence and bone metabolism in obese elderly patients undergoing bariatric surgery

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SantoCarefull bone metabolism evaluation in the elderly undergoing bariatric surgery is required since fractures are related to high morbidity, mortality and costs. Recent researches question the protective effect of obesity and propose that sarcopenia, osteopenia and obesity have a common pathophysiology. Evaluate the prevalence of

BMI and %BWL at one, two and three months after intervention, as well as commuting length, type of commute, and number of days at work. Weight loss intervention included dietary and exercise management, as well as pharmacotherapy. Patients were stratified into commuting and non-commuting groups. The primary outcome was %BWL after intervention, correlated to commute, commuting length, and type of commute.

Results: There were 318 patients in the commuting group and 51 non-commuters. Initial BMI for the two groups was similar (37.1 vs 36.3, $p = .514$). Commuters were significantly younger (44 vs 62.2 years, $p < .0001$) and had lower use of hypertensive medications (21% vs 45%, $p < .0001$). There was no difference seen in %BWL between the two groups after one month of therapy (3.1% vs 3.0%, $p = .783$), two months (5.1% vs 4.9%, $p = .831$), or three months (6.9% vs 7.2%, $p = .806$). Duration of commute was also not correlated with %BWL ($p = .383$ at three months). Male gender, walk/biking commute mode, and hypertension medications were independently predictive of greater %BWL. Males had an average of 0.9% greater %BWL ($p = 0.030$), subjects that used a bike or walked as their commute mode had an average of 1.7% greater %BWL ($p = 0.0091$), and those with hypertension medications had an average of 1.0% greater %BWL ($p = 0.015$).

osteopenia and/or osteoporosis, falls and gait impairment in patients ≥ 60 years undergoing bariatric surgery. Retrospective study of 43 patients, between 2012 and 2016. Falls in the previous 6 months, history of fractures, basic activities of daily living (BADL), Timed Up and Go (TUG), bone densitometry and calcium homeostasis were evaluated. Mean (SD) age and BMI were 65,8 (+3,7) and 43,4 kg/m² (+5,69), respectively and 24 (55,8%) were 65 years and older. Prevalence of osteopenia, impairment in at least one BADL and fall were, 8 (18.5%), 12 (27.9%) and 7 (16.3%), respectively. Fragility fracture was present in 2 (4,7%) and 18 (41,9%) had TUG impairment. In this sample those 65 years and older had lower BMI (42,6 vs 44,4 kg/m²; $p = 0.19$) and those with BMI ≥ 45 kg/m² had significantly more BADL impairment ($p = 0.16$) and falls ($p = 0.001$). When considering falls, TUG impairment and osteopenia, 72% of the sample had at least one of them. In this sample there is a high prevalence of falls, TUG impairment and osteopenia, specially in those with BMI ≥ 45 kg/m². These parameters can be considered important

comorbidities of the elderly obese patients and must be better evaluated in those undergoing bariatric surgery.

A5166

Pre-bariatric surgery psychological evaluation: assessing beliefs about surgery Mirella P. Auchus Ph.D., MBA VAMC Jackson Mississippi, and Private Practice Psychology, Flowood, Mississippi, USA
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Background: Many studies have surveyed psychological assessment protocols used for evaluating bariatric surgery candidates. Although mental health practitioners generally conduct a clinical interview and administer various measures including self-report and objective measures in their assessment protocol, review of the literature does not reveal a standardized psychological protocol or battery. The psychological assessment usually includes a clinical interview which addresses motivation for surgery, weight/diet history, eating behaviors, psychiatric history (including alcohol and substance abuse), and support network. In addition to the clinical interview, psychological testing is often administered to acquire objective information. However, the bariatric surgery candidate's underlying beliefs and expectations of surgery are not generally emphasized. The purpose of this study was to explore candidate specific beliefs about how surgery would effect stress and overeating.

Method: The participants were 28 female and one male candidates ages 25 to 67 who presented for a pre-bariatric surgery psychological evaluation. As part of their psychological assessment protocol, participants completed a bariatric surgery questionnaire which included beliefs about surgery's effect on overeating and stress.

Results: The results revealed that 21.4 percent of candidates believed that surgery would change how they react to stress, 53.5 percent believed that surgery would enable them to stop eating as soon as they were full and 28.5 percent believed that they would be unable to overeat after having weight loss surgery.

Conclusions: A notable percentage of bariatric surgery candidates believe that surgery will stop them from eating when full, prevent them from overeating and change how they react to stress, all of which are inaccurate beliefs and expectations of surgery. These results suggest that it is critical for

mental health practitioners to assess patient beliefs in their psychological evaluations so that inaccuracies can be identified and addressed prior to surgery. This will afford patients the opportunity to obtain appropriate expectations and accurate understanding of surgery and it's limitations, therefore enhancing a greater sense of personal control and responsibility for a long-term positive outcome. Keywords: pre-bariatric surgery psychological evaluation, beliefs, expectations

A5167

BARIATRIC ENDOSCOPIC PREOPERATIVE FINDINGS: THE IMPORTANCE: THE NECESSITY: OUR EXPERIENCE 1767 Patient Analysis

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Background: Over the past decade bariatric surgery gained the limelight as a premier form of permanency with respect to weight loss. Today, nearly 30% of the worlds' population is considered mildly and/or morbidly obese. Consequently, several surgical procedures were developed to alleviate the worldwide obesity epidemic. The most common of these procedures include, Longitudinal Sleeve Gastrectomy (LSG), Roux-en-Y gastric bypass (RYGB), and Gastric banding (GB). Each with its varying levels of efficacy, every bariatric procedure is not a viable option for all patients. Although the following procedures have different approaches to weightloss, whether restrictive or malabsorptive, all patients should receive a diagnostic endoscopy for the purpose of preoperative clearance. The following review discusses the incidental findings, the benefits, and the necessity for preoperative endoscopic exploration in bariatric patients.

Methods: The following study consists of one thousand-seven-hundred-sixty-seven (n=1,767) bariatric patients (Male=759, Female=1,008) with ages ranging from 16-59 years of age who received various bariatric procedures. All preoperative EGD studies were compiled and analyzed for abnormalities. All patients received weight check, blood workup and general examination pre-operatively and post operatively at 1 week, 1 month, 3 month, 6 months and 1 year. All patients were enrolled in Bariatric/Metabolic Center of Excellence at RWJUH and subject to all requirements including

nutrition, exercise, and support group regimens. Patients were assessed for excess weight loss, resolution of comorbidities, complications, vitamin deficiencies, and general quality of life postoperatively.

Results: Total Rate incidental Endoscopic Preoperative Finding 21.4%Gastric Ulcer non specific= 1.64%Barrets Esophagus= 0.73%Gastric Cancer= 0.90%Hiatal Hernia= 7.84%Diverculitus= 1.52%Polyp growth benign= 7.01%IBD due to Ulcerative Colitis: 0.74%IBD due to Crohns Disease: 1.02%.

Conclusions: Preoperative endoscopy has particular risks and benefits that must be accounted for when exploring prospecting bariatric patients. As such, reasonable guidelines such as preoperative endoscopy are necessary to ensure successful/safe weight loss in operative bariatric patients.

A5168

A Single Center Results Examining Diet Compliance and Eating Behaviors from the Essential Trial: A Blinded, Randomized Control Trial Evaluating Safety & Effectiveness of an Endoscopic Weight Loss Procedure (pose procedure™)

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Background: The intensity of lifestyle intervention and patient compliance are significant factors in achieving optimal and sustainable weight-loss following any bariatric procedure. The Essential Trial evaluated the safety and effectiveness of the USGI Medical g-Cath™ EZ Suture Anchor Delivery Catheter as an endoscopic weight loss procedure (pose procedure™) for patients with Class I obesity with at least 1 non-severe obesity related co-morbid condition and Class II obesity with or without a non-severe obesity related co-morbid condition. Low intensity lifestyle counseling was provided during the follow-up visits of this study. A total of 332 patients were randomized across 11 U.S. centers. Presented are the weight loss results from one of those centers.

Methods: The Essential Trial was a prospective, randomized, double blinded multi-site study that examined the weight loss differences between a treatment group receiving the pose procedure and a sham control group at one year. The pose procedure uses flexible endoscopic instruments to make folds in targeted areas of the stomach to help

patients feel full faster with smaller portions of food and stay full longer after eating. Each randomized group received low intensity lifestyle therapy (6 visits post procedure) with a blinded study dietitian who assessed changes in eating behaviors and diet compliance. These follow-up sessions were time limited with prepared nutritional topics. Self reported diet compliance was assessed at each visit based on a 5-point Likert scale. Compliance was defined as 'always' or 'usually' followed the recommended diet measured at each time point. The TFEQ was collected to assess eating behaviors at baseline, 6 months, and 12 months post randomization.

Results: 61 patients were randomized. Twelve month %TBWL differences between the groups (n= 55, 38tx:17ctl) was statistically significant (p=.0059) with an eleven pound treatment delta over sham. For those patients who reported diet compliance (n=,19, 15tx: 4ctl) a difference of 17.5 lbs. was noted, representing a statistically significant weight loss difference between groups. (p=.0451). Statistically significant improvements in the uncontrolled eating sub-scale of the TFEQ was observed between the groups at 12 months over baseline (p=.0442).

Conclusion: The pose procedure demonstrated a clinically and statistically significant weight loss result over the sham group. The pronounced difference between the groups demonstrates a strong treatment effect of the *pose procedure*. In addition, those patients who reported dietary compliance were much more successful in losing weight. Bariatric procedures in general are associated with changes in eating behaviors. The study results demonstrated this despite limited dietary counseling sessions. The *pose procedure* coupled with a lifestyle therapy program that is not encumbered by the restraints of a blinded, controlled study may result in greater and more sustained weight loss.

A5169

15+ year weight change outcomes and complications after Roux-en-Y gastric bypass: a single-center study

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Introduction: Roux-en-Y gastric bypass (RYGB) is the most commonly performed bariatric surgery procedure in the United States. The short-term outcomes following RYGB have been well studied; however, evidence on long-term (>5 years) outcomes following RYGB is sparse, particularly in the U.S. population. Using data from patients who underwent RYGB at Washington University School of Medicine in St. Louis, we studied longitudinal patterns of weight loss and regain following RYGB up to 18 years after surgery and recorded the number of patients who experienced adverse events.

Methods: We identified 1,411 patients who underwent RYGB at Washington University between 1997 and 2010 and assembled them into a retrospective cohort. Patient data was collected from the electronic medical record and the surgeons' databases between June 15, 2015 and September 13, 2015. We excluded 165 patients due to history of prior gastric surgery; an additional 142 patients were excluded from the analysis of body mass index (BMI) due to missing BMI information. This yielded 1,104 patients for BMI analysis and 1,246 patients for complications analysis. Each patient's BMI was computed as weight in kilograms (kg) divided by the square of height in meters (m). BMI loss was defined as pre-operative BMI minus post-operative BMI. Unadjusted analysis of BMI loss was plotted against time (years after surgery) as a B-spline curve fit with 95% confidence intervals. Multivariable adjusted analysis was conducted using a mixed linear model to account for the correlation between multiple weight measurements of the same individual. We used the following covariates: year of surgery, age at time of surgery, gender (reference: female), race/ethnicity (Caucasian [reference], African American, Hispanic), insurance type (private [reference], government-sponsored, self-pay, other), laparoscopic (reference) or open surgery, pre-operative BMI, duration between pre-operative BMI measurement and date of surgery (<30 days [reference], 30-90 days, >90 days), and a sixth-degree polynomial of the duration between date of surgery and date of post-operative weight measurement. A p -value of 0.05 was used for statistical significance. In the complications analysis, we recorded the number of patients who experienced adverse events, including complications, reoperation within 30 days of surgery, and death within 30 days of surgery, and stratified them by open and laparoscopic procedures.

Results: Our cohort for BMI loss analysis included 1,104 patients: 81.2% were female, 90.0% were Caucasian, 9.5% were African American, and 0.5% were Hispanic. Among them, 73.1% had private insurance, 22.4% had government-sponsored insurance, 1.6% self-paid, and 2.9% did not have documented insurance. Moreover, 69.3% of patients received laparoscopic RYGB. Median age at time of surgery was 46.5 years (range: 19.0-69.5 years) and median pre-operative BMI was 52.6 kg/m² (range: 35.6 kg/m²-98.2 kg/m²). The proportions of patients with follow-up greater than 1, 5, 10, and 15 years were 1,028 out of 1,104 patients undergoing surgery >=1 year before September 13, 2015 (1,028/1,104, 93.1%); 524/1,104 (47.5%); 178/710 (22.5%); and 22/168 (15.5%), respectively. The median follow-up time was 4.5 years (range: 4 days-18 years). In the unadjusted analysis of BMI loss (Figure 1A), patients experienced a rapid BMI loss of 21.6 kg/m² after 1 year and 8 months, at which point the maximum BMI loss was reached. Patients regained a small amount of weight in the subsequent years, but BMI loss at 5, 10, and 15 years were relatively stable at 18.3 kg/m², 18.0 kg/m², and 17.2 kg/m², respectively. In the multivariable adjusted analysis of BMI loss, predictors of post-operative BMI loss were identified. Younger age ($p=0.0052$) and higher pre-operative BMI ($p<0.0001$) were associated with larger BMI loss. Compared to private insurance, Medicare was associated with smaller BMI loss ($p=0.038$); compared to Caucasians, African Americans were associated with smaller BMI loss ($p=0.0003$). Using the estimates from the multivariable adjusted model, we predicted the BMI loss trajectory (Figure 1B) for a 45-year-old female patient undergoing laparoscopic RYGB in 2004 with a pre-operative BMI of 54.7 kg/m² and private health insurance. This patient experiences a maximum BMI loss of 22.1 kg/m² at 2 years after surgery. She regains some weight over the subsequent years, with BMI loss at 5, 10, and 15 years at 16.7 kg/m², 17.8 kg/m², and 19.3 kg/m². The five most common complications among the 1,246-patient complications cohort were wound infection (167/1,246), incisional hernia/dehiscence (107/1,246), stricture requiring endoscopic dilation (56/1,246), partial small bowel obstruction (43/1,246), and upper GI bleed (36/1,246). Within 30 days of surgery, 52/1,246 patients received reoperations and 9/1,246 died (Table 1).

Conclusions: In RYGB patients age >=18 years at Washington University, we found RYGB to be associated with sustainable long-term weight loss

and low incidence of complications. We further identified older age, lower pre-operative BMI, having Medicare (compared to private insurance), and being African American (compared to Caucasians) to be predictors of smaller BMI loss following RYGB. Our study contributes to the understanding of the long-term effectiveness of RYGB in combating morbid obesity in the United States.

A5170

Lived Experience Following Roux-en-Y Gastric Bypass

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Introduction: Positive comments and high satisfaction expressed by patients who failed to achieve or sustain weight loss following bariatric surgery intrigued researchers in a previous study. Further exploration of this phenomenon was merited.

Methods: After answering questions regarding nutrition, supplements, and co-morbid conditions, participants were asked to rate satisfaction (on a scale of 1-10) with their gastric bypass experience. Participants were then asked to share additional comments. Using Phenomenology, we reviewed transcribed patient comments into ideas, categories, and themes.

Results: 262 patients comprised the study population. All study participants rated their satisfaction with the bariatric experience and 55% shared a comment. Responses were categorized as positive, neutral, or negative. Positive comments (95) had a median satisfaction score of 10; neutral comments (34) had a median satisfaction score of 9; negative comments (16) had a median satisfaction score of 2. Satisfaction, appreciation, and gratefulness emerged as themes from the positive comments. Satisfaction ranged from the exuberant, 'I am pretty freakin' ecstatic with the whole process and outcome' to the more cautious, 'I'm pleased but it's a struggle.' Appreciation was expressed as 'this procedure was life changing for me.' Statements such as, 'If I had not had the surgery I would be dead' expressed patients' gratefulness for the procedure. Eight percent of positive comments

explicitly acknowledged the amount of weight loss that occurred. Twenty-three percent mentioned they would undergo surgery again or would recommend the procedure to others. Neutral comments contained the themes of Reflection, Acknowledgment, and Wistfulness. Reflection included insightful comments such as, *'I could have made it better by not going back on my old eating habits'* or the more introspective, *'I struggled over the years but I'm still a lot less [weight] than when I came for surgery.'* Acknowledgment included a sense of accountability for results, *'I didn't always follow the diet plan'* as well as the more instructive, *'Gastric bypass is not a miracle, you have to work very hard to keep the weight off.'* Wistfulness was represented by the statement, *'I wish I could do it again.'* Themes of dissatisfaction, disappointment, and regret emerged from the negative comments.

Dissatisfaction is illustrated by the comment, *'I plateaued and have not lost any more weight. I have a constant pain in my left side and nausea.'* Indeed, 38% of negative comments mention continued adverse effects and symptoms following surgery. Disappointment is evident in the comment, *'I'm not at my goal weight at 10 years out.'* Forty-four percent commented on regaining weight or not reaching goal weight. Two participants mentioned issues with follow-up care. Thirty percent explicitly stated their regret at having undergone surgery, *'I wish I never had it done. I got down to 254, but I am back up.'* nor would they recommend the procedure to others.

Conclusion: Patients readily shared comments regarding their gastric bypass experience. Exploring the themes that emerged from the comments gave us insight into patient's lived experience of their ongoing journey following surgery.

A5171

National Costs of Bariatric Surgery and Predictors of Extreme Costs: An Analysis Of National Inpatient Sample

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Introduction: Bariatric Surgery is the currently the most effective treatment of morbid obesity. In the

current health care environment, Bariatric surgery centers need to be more cost-effective while maintaining quality. The aim of this study was to evaluate national cost of bariatric surgery and to identify which factors associated with higher costs.

Method: This is a retrospective analysis of 2012-2013 Healthcare Cost and Utilization Project - Nationwide Inpatient Sample (HCUP-NIS). We included all patients with a diagnosis of morbid obesity (ICD9 278.01) who underwent Roux-en-Y Gastric Bypass (RYGB), Sleeve Gastrectomy (SG), or Adjustable Gastric Band (AGB) placement as their primary procedure. We converted 'hospital charges' to 'cost', using hospital specific Cost-to-Charge Ratio. Inflation was adjusted using annual Consumer Price Index. Extreme cost was defined as the top 20th percentile of expenditure and it was analyzed using logistic regression multivariate analysis.

Results: A total of 45,219 patients (20,966 RYGB, 22,380 SG, and 1,873 AGB) were studied. The Median (Interquartile range) calculated cost for RYGB, SG, and AGB were \$12,543 (9,970-15,857), \$10,531 (8,248-13,527), and \$9,219 (7,545-12106), respectively ($P < 0.001$). Hospital cost of RYGB and SG increased linearly with length of hospital stay and almost doubled in a week (Fig 1). Multivariate analysis on RYGB and SG showed that the following items are associated with extreme cost: multiple other diagnoses (comorbidities), RYGB (versus SG), male gender, number of procedures, and length of hospital stay (Table 1).

Conclusion: Main factors contributing to cost variation of bariatric procedures are patient comorbidities, complexity of surgery, and hospital length of stay. Cost analysis is crucial to understand which aspects of care have the greatest impact on the hospital costs.

A5172

No More Broken Hearts: Weight Loss after Bariatric Surgery Returns Patients Post-Operative Risk to Baseline Following Coronary Surgery.

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Background: The obesity epidemic is associated with a rise in coronary surgeries as obesity is a risk factor for coronary artery disease. Bariatric surgery has been linked to an improvement in cardiovascular comorbidities and left ventricular function. To date, no papers have investigated a survival advantage in

post-operative bariatric patients after coronary surgery. The aim of this study is to assess if there is benefit after coronary surgery in the post-operative bariatric surgery patient.

Methods: We performed a retrospective, cross-sectional analysis of the National Inpatient Sample database from 2003-2010. We selected patients with a history of bariatric surgery who then underwent coronary surgery ($n = 257$). A comparison of post-operative complications and mortality following coronary surgery were compared to controls ($n = 1442$). The sample was analyzed using Chi-squared tests, linear regression analysis and multivariate logistical regression models.

Results: A subset population of the database was identified as having undergone coronary surgery ($n = 1699$); of these, we identified 257 patients who had previous bariatric surgery. They were compared to 1442 controls. A majority of the study population was male (67.2%), white (82.6%) and were treated in an urban environment (96.8%). After controlling for demographics, patients with previous bariatric surgery assumed the risk of their new BMI of post-operative complications after coronary surgery (BMI < 25 , OR 1.01, 95% CI 0.76-1.34, $p = 0.94$; BMI 25- < 35 , OR 0.20, 95% CI 0.02-2.16, $p = 0.19$; BMI ≥ 35 , OR > 999.9 , 95% CI 0.18- > 999.9 , $p = 0.07$). Cost of hospital stay was significantly lower in post-bariatric patients as compared with controls (BMI 25-35, OR < 0.001 , 95% CI < 0.001 - < 0.001 , $p < 0.001$). Length of stay was significantly longer in post-bariatric patients (BMI < 25 , OR 1.62, 95% CI 1.14-2.30, $p = 0.007$).

Conclusions: In post-operative bariatric patients, a return to baseline risk of morbidity and mortality was demonstrated following coronary surgery.

A5173

NECK CIRCUMFERENCE TO THYROMENTAL RATIO AS A PRONOSTIC PREDICTOR OF DIFFICULT INTUBATION IN OBSESE PATIENTS Guerrero JG MD, Minutti M MD, Velázquez-Fernández D PhD, Herrera M PhD, Palacios A MD, Chávez MA MD, Romero P MD, Dominguez-Cherit G MD

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Background: The adequate management of the airway is a fundamental skill for the anesthesiologist. The incidence of difficult intubation in general population is 5.2%-6%. It rises in different populations, like obese patients, reported in 5.8%-

15.8%. In the pre-anesthetic evaluation, there are criteria such as Mallampati, mouth opening, thyromental distance, sternomental distance, neck circumference, BMI, all of them to determine the possibility of a difficult intubation. Brodsky et al, demonstrated, in the obese patient that Mallampati \geq III is associated with a problematic intubation and with a neck circumference of 40cm the risk rise to 5% and up to 35% with 60cm, beside, every centimeter $<u>$ up from 40cm $</u>$, the risk rise 1.13% (95% CI, 1.02 to 1.25). Kim and cols, proposed and demonstrated that neck circumference (NC) to thyromental distance (TM) ratio \geq 5, is a better predictor of difficult intubation in obese patients, with sensitivity of 88.2% and negative predictive value of 97.8%, being more significant than all other predictors alone (TM sensitivity 58.8% and NPV 93.2%, Mallampati \geq III sensitivity 58.8% and NPV 93.1%).

Purpose: to identify if NC/TM ratio could be used as an adequate predictor of difficult intubation in the obese patient.

Patients and methods: Residents of anesthesia and anesthesiologists will evaluate patients and gather data, measurements and anesthetic criteria such as Mallampati, mouth opening, thyromental distance, sternomental distance and neck circumference. A difficult intubation will be determined by the intubation difficulty scale (IDS) by the more experienced anesthesiologist in the procedure. Data will be taken from data collection sheet. This is a transversal, analytical, observational, comparative study cutting the frequency for difficult intubation between obese patients and non obese patients. The sample size was calculated a priori, considering the published by Kim et al. for comparative frequency of difficult intubation of 14.5% in obese patients and 4.5% in non obese patients, with an alpha error of 5% or 0.05, a statistic consideration at least of 80% or 0.80 (two-tailed hypothesis) We used G*power.

Results: A total of 79 patients were included in the study analysis. The mean age was 45.63 (range between 19-81 years) 57% were women. 39.2% were obese (31 patients). The range of anthropometric values \pm SD used were weight 85.9 \pm 28.2 kg, height 1.67 \pm 0.09 mts, BMI 30.59 \pm 9.76 kg/m². Only 10.1% (8) patients had type 2 diabetes, 12.7%(10) OSA AND 22.8% (18) had hypertension. According to Mallampati score, 6.3% were class 4, 19% (15) class 3, 45.6% (36) class 2, and 29.1% (23) class 1. According to STOP-Bang score 21.5% (17) had a high risk for OSA. All patients were intubated with a TOF of 0%. Only 1.3 % (1 patient) had a

Cormack-Lehane class 4, 20.3% (16) class 3, 41.8% (33) with class 2 and 36.7% (29) class 1. The 24.1% (19) had a difficult intubation and 75.9% an easy intubation. The neck circumference/ thyromental ratio was on average \pm SD of 6.04 \pm 1.72 (range between 2.52-11.56) cms. The average \pm SD for patients with easy intubation vs difficult were statistically significance when evaluated by Student's t ($p < 0.0001$). As well as the neck circumference/ thyromental ratio and neck circumference/mouth opening were statistically significance between this two groups for the bivariate contrast with a T-Student ($p < 0.004$). Both contrast between patients with easy intubation (IDS < 5) and difficult intubation (IDS > 5) are shown in figure 1. During the comparison of the different cut-offs for the previous relations through the use of ROC curves we determinate that these 3 relations had a AUC (ROC) of de 0.761, 0.737 y 0.733 respectively, all with statistically significance ($p < 0.002$). Figure 2 show the curves for each one of the relations statistically compared.

Conclusions: With the obtained results and hypothesis we concluded that the neck circumference/ thyromental ratio \geq 5.5 cm in our population has a sensitivity of 89.% and a specificity of 66.7% ($p < 0.001$) for difficult intubation according to IDS, contributing with another tool for the anesthetic management with intubation for patients with or without obesity. We also concluded that the neck circumference/ thyromental ratio (2.5cm) and neck circumference/mouth opening (9cm), had a significant association with difficult intubation for IDS ($p < 0.004$). Among the advantages of this study were that the patients were treated by two teams of anesthesiologists, airway experts qualified to classify IDS and the intubation circumstances were similar in most of the cases. The limitation of this study is the sample size even though in the statistical analysis we obtained positive results, we would encourage to apply this relations in everyday practice.

A5174

Reducing 30-Day Readmission Rates Following Bariatric Surgery

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Obesity is a growing problem in the United States affecting over 1/3 of the adult population. The rise in the incidence of obesity and subsequent rise in surgical intervention has led bariatric surgical

programs to focus on providing quality care, including reducing readmission rates. The Metabolic and Bariatric Surgery Accreditation and Quality Improvement program tracks non-risk adjusted 30-day readmission rates nationally, in 2012 the national rate of after Roux-en-Y gastric bypass was 6.8% compared to the program's 9.4%. The Bariatric Continuous Process Improvement (CPI) team posed the question: Could increasing education for patients focusing on the transition from liquids to solids, combined with utilization of standardized care plans, incentive spirometry use, and early ambulation decrease the 30-day readmission rate for this Bariatric Surgery program? After reviewing relevant literature and a thorough review of readmissions, the Bariatric CPI team made recommendations for practice changes effective November 2012. Those changes included auditing charts for performance of three nursing process measures, quarterly review of quality data including 30-day readmissions at multidisciplinary team meetings, and increased emphasis on hydration during transition to solids. These interventions led to a reduction in non-risk adjusted 30-day readmission rates for the program in 2013 of 3.6% compared to the national rate of 6.10% and a further reduction of readmission rates to 1.6% in 2014 compared to the national rate of 6.40% in 2014.

A5175

The implementation of a fast-track protocol for laparoscopic duodenal switch reduces 30-days complications, operating time and length of stay in hospital

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Background: Less than 2 % of bariatric operations performed worldwide 2013 were biliopancreatic diversion (BPD-DS). The reasons for this phenomenon are miscellaneous: Technical complexity, procedure-associated complications and aspects regarding patient-selection are frequently named. The goal of this study is to describe the steps of implementation of a fast-track protocol for laparoscopic duodenal switch in a regional bariatric center in Sweden specialized in this technique.

Methods: All patients operated with a BPD-DS at the bariatric center of Torsby Hospital in Sweden between June 2010 and April 2016 were included in this study. The fast-track protocol was introduced in three steps. During the first time interval (6/2010

until 9/2012) the pre-operative nutritional education program and the intensive follow-up program were established. The introduction of a multidisciplinary pre-operative assessment was the second step of the fast-track protocol (10/2012 until 4/2014). By modifying the operation technique and creating the SOFY procedure for laparoscopic duodenal switch the third cornerstone of the fast-track protocol was laid (since 5/2014). Data were extracted from a prospectively maintained database.

Results: 76 patients were included in the study (25 individuals in the first time interval T1, 23 in the second interval T2 and 28 in the third interval T3). The median operating time was 171 min (114 - 279 min) in T1, 140 min (109 - 200 min) in T2 and 136 min (108 - 189 min) in T3. During the same time intervals the median length of stay in hospital declined from 4 d (2 - 24 d) to 3 d (2 - 4 d) and 2 d (2 - 84 d) respectively. In T1 and T2 seven patients suffered from a 30-day complication of which two were classified as Clavien-Dindo IIIb with leakage from the enteroanastomosis. One major complication occurred in T3: Leakage from the sleeve gastrectomy required several re-operations.

Discussion: The step-wise introduction of a fast-track protocol for laparoscopic duodenal switch has been contributing to a reduction of operating time, length of stay in hospital and 30-days complications. The pre-operative nutritional education program prepares the patient for the postoperative course. Fluid restriction to 500 ml on the first postoperative day and limitation to fluids during the first two weeks contribute to fast recovery. Under the following four weeks puree and well chewed food are allowed enabling the patient to become accustomed to the duodenal switch. By introducing a multidisciplinary pre-operative assessment patient-selection improved. The inability to change eating-patterns, psychological disorders leading to fragile structure in daily routines and certain pre-existing gastrointestinal conditions are exemplary factors disqualifying patients for a duodenal switch. The motivation to modify the operation technique was to improve the surgical workflow, to get a better overview over the different intestinal limbs and to facilitate the closure of the mesenteric defects. The SOFY-DS-procedure accomplishes these targets. The stepwise implementation of a fast-track protocol for laparoscopic duodenal switch between 2010 and 2014 has led to a decline of operating time, length of stay in hospital and incidence of 30-days complications.

A5176

Early Experience with Duodenal Switch as a Primary or Revisional Operation

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Introduction: The aim of this study is to evaluate the one-year outcome of DS as a primary operation or revisional procedure at our institution.

Methods: All patients who underwent DS, from 2010 to 2015 were identified. Data collected included baseline demographics, co-morbidities, perioperative parameters, length of stay, morbidity and mortality and weight loss at one-year follow-up. Data was summarized as the median for continuous variables and as counts and percentages for categorical variables.

Results: A total of 24 who underwent DS were identified. Female was predominant (n=20, 83%) with a median age was 39 years (range, 19-58). The median preoperative body mass index (BMI) 60.7 kg/m² (range, 41.7-86.0). Co-morbidities: Hypertension (n=15, 63%), dyslipidemia (n=9, 38%), diabetes mellitus (n=10, 42%), sleep apnea (n=24, 100%) and fatty liver (n=15, 63%). All DS procedures were performed laparoscopically with a median operative time of 254 minutes (range, 158-420). DS was primary surgery in 7 patients and as a revisional procedure with a median duration of 1.3 years after SG (n=13) and gastric band (n=4). The median length of common limb and alimentary limb were 100 cm (range, 75-200) and 175 cm (range, 150-300) respectively. The 30-day complication was 20% with one patient had a major complication (pyloric obstruction treated by endoscopic dilatation). There was no 30-day mortality. The excess weight loss at 1 year (83.3% follow up) was 56.4% (range, 17.8-94.2). Resolution of co-morbidities at 1 year: Hypertension (20%), hyperlipidemia (33%) and diabetes (60%). The complication at 1 year was 35% (n=7) with major complications were malnutrition requiring TPN and feeding jejunostomy (n=2) and gastric band port site infection requiring surgical intervention (n=1). Otherwise, there was no mortality at 1 year.

Conclusion: DS is an acceptable option as primary or revisional procedures after SG or LAGB. Malnutrition remains a significant complication requiring close monitoring. Alimentary limb and common channel limb lengths may require lengthening to reduce

malnutrition. Keywords: Bariatric surgery, duodenal switch, revision

A5177

Laparoscopic conversion of One Anastomosis Gastric Bypass/Mini Gastric Bypass to Roux en Y gastric bypass for Bile Reflux Gastritis

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Background: One anastomosis Gastric bypass/Mini Gastric bypass (OAGB/MGB) was first described in 2001. Large series from experts show a low rate of bile reflux gastritis and marginal ulceration. However, these complications are common during the learning curve of OAGB/MGB. Here in we present 3 cases of laparoscopic management of patients with severe bile reflux gastritis and perforated marginal ulcer after OAGB/MGB.

Methods: We have reviewed our prospective data base for all patients presenting with complications of OAGB/MGB from 2012-2016.

Results: We have seen 3 patients with severe bile reflux gastritis, malnutrition and failure to thrive. All 3 patients were re operated by the primary surgeon before referral to our institution. Two had Braun jejuno-jejunostomy (1 with hiatal hernia repair and partial Nissen/Toupet fundoplication utilizing the remnant), 1 had laparoscopic cholecystectomy without improvement. All 3 patients were malnourished and required enteral/parenteral nutrition for several weeks prior to conversion to Roux en Y gastric bypass. Upper endoscopy confirmed severe bile reflux gastritis/esophagitis in all 3 patients. The most common intra operative finding in all 3 patients was a short gastric pouch 4-5 cm long. No conversions, leak, stenosis or mortality. Bile reflux gastritis, malnutrition resolved in all 3 patients. One patient developed a non healing marginal ulcer requiring revision of the gastro-jejunostomy.

Conclusion: Bile reflux gastritis is common after OAGB/MGB if the gastric pouch is short. Persistent non healing ulcer may require operative revision.

A5178

Laparoscopic Sleeve Gastrectomy Versus Gastric Bypass In The Treatment Of Type 2 Diabetes Mellitus: The Use Of ABCD Scoring System.

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Abstract Objective: To compare the efficacy of two most commonly performed bariatric/metabolic surgeries, sleeve gastrectomy (SG) and gastric bypass (GB) with regards of remission of T2DM after surgery.

Background: Bariatric surgery has gained reputation for its metabolic effect and is increasingly being performed to treat type 2 diabetes mellitus (T2DM). However, there is a grey area regarding the choice of surgical procedure according to patient characteristics due to inadequate evidences, so far.

Methods: Outcomes of 579 (349 women and 230 male) patients who had undergone SG (109) or GB (470) for the treatment of T2DM with one year follow up were assessed. The remission of T2DM after SG or GB surgery was evaluated in matched groups using the ABCD scoring system. The ABCD score is composed of Age, BMI, C-peptide levels and Duration of T2DM (years).

Results: The weight loss of the SG patient at one year after surgery was similar to the GB patients [26.3(1.1)% vs. 32.6(1.2)%; $p=0.258$]. The mean BMI decreased from 35.7(7.2) to 28.3(3.7) kg/m² in SG patients at one year after surgery and decreased from 36.9(7.2) to 26.7(4.5) kg/m² in the GB patients. The mean HbA1c decreased from 8.8 to 6.1% of the SG group and from 8.6 to 5.9% of the GB group. Sixty-one (56.0%) patients of the SG group and 300 (63.8%) of the GB group achieved complete remission of T2DM (HbA1c < 6.0%) at one year after surgery without statistical difference. However, GB exhibited significantly better glycemic control than SG surgery in groups stratified by different ABCD score. At 5-year after surgery, GB had a better remission of T2DM than SG (53.1% vs. 35.3%; $p=0.055$).

Conclusion: In conclusion, although both SG and GB are effective metabolic surgery, GB carries a higher power on T2DM remission than SG. ABCD score is useful in T2DM patient classification and selection for different procedures.

A5179

Factors predicting remission or improvement of Type 2 Diabetes after gastric bypass

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Introduction: Remission of diabetes is a very significant spinoff after bariatric surgery in patients with obesity. Though recently, there has been an increased understanding of factors which can predict remission or improvement in diabetes, huge variability and uncertainty is still prevalent.

Methods: Data of all patients with type 2 diabetes mellitus (T2DM) admitted for bariatric surgery in the form of laparoscopic gastric bypass (LYGB) over a two year period was analysed. Data obtained included demographic data, pre-op BMI, body weight, HbA1c at presentation and last follow-up. In addition, remission or improvement in diabetes was identified by change in HbA1c and in treatment regime. Statistical analysis was performed using SPSS version 24.

Results: 70 patients underwent LYGB {Mean age - 53 (range: 31-72); M:F = 32:38}. At a mean follow-up period of 23 months, the mean HbA1c showed a marked decrease from 61.6 to 43.5 (Mean difference =18.14 [95% CI: 13.9-23.1]; $p<0.0001$ Paired t-test). The mean percentage excess body weight loss (EBWL) was 69.3% (sd+-20.5). This corresponded with a decrease in mean BMI from 47.3 to 32.7 ($p<0.0001$ Paired t-test). The duration of T2DM in LYGB patients was from 1 year up to 16 years with 6 patients on diet control regimes and 64 on medical treatment. Post operatively 37/64 completely stopped medical treatment and was in remission for the duration of the follow-up period. This included 26/37 on oral hypoglycaemics alone; 4/37 on oral hypoglycaemics + insulin; 5/37 on oral hypoglycaemics + GLP-1 analogues; and 2/37 on GLP-1 analogues + Insulin. A further 17/64 demonstrated reduction in their medication requirement due to improvement in T2DM control whereas a further 10/64 stayed on the same medication regime due to inadequate improvement. Binary logistic regression analysis was used to assess the effects of duration of T2DM, pre-op insulin treatment, pre-op BMI and HbA1c on the likelihood of T2DM remission post-operatively (defined as HbA1c less than 42mmol/mol and/or stopping medication). The logistic regression model explained 27.5% of the variance (Nagelkerke R^2) in T2DM remission, correctly classifying 72.9% of cases. Patients not on insulin pre-operatively were 5.6 times more likely to show remission of T2DM and this was statistically

significant (OR=5.6; 95% CI: 1.6-20; p=0.007). Other variables were not significantly associated with T2DM remission. A further logistical regression analysis was used to determine need for medication post-LYGB (including individuals who had both improved glycemic control and complete remission). The logistic regression model explained 28.5% of the variance (Nagelkerke R^2) in T2DM remission, correctly classifying 71.4% of cases. Those not on insulin pre-operatively were 4.5 times more likely to show remission of T2DM (OR = 4.5; 95% CI: 1.3-15.8; p=0.017). Furthermore increased duration of T2DM was significantly associated with reduced likelihood of T2DM remission (OR=0.88 [95% CI 0.78-0.99]; p=0.049).

Conclusion: Remission or improvement in diabetes is recognised as a weight loss independent effect after gastric bypass surgery. Among all the factors, lack of insulin dependence prior to surgery is recognised as an important factor in predicting remission of diabetes as highlighted in our study. Prolonged duration of T2DM preoperatively may be a negative factor in predicting post-operative improvement or remission of diabetes.

A5180

BARIATRIC & METABOLIC SURGERY WITHOUT MALABSORPTION

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Background and aim: Obesity and Type 2 Diabetes are increasing worldwide and only surgical manipulations provide sustained treatment options in the long term. Among surgical techniques, those based on intestinal diversions are associated with higher success rates, compared to restrictive operations. However, operations based on intestinal manipulations are associated with varying degree of malabsorption and thus require life-long supplementations. We hereby represent a novel method named the 'transit bipartition' which is associated with absolute no malabsorption, with acceptable control rates on weight and related comorbidities.

Materials & Methods: Fifty-five consecutive overweight or obese type 2 diabetic patients, with 1 year follow-up were evaluated retrospectively, just before and 1-3-6-12 months after laparoscopic sleeve gastrectomy with Transit Bipartition surgery, by measuring body weight and Body Mass Index (BMI), HbA1c, plasma hemoglobin (Hb), hematocrit (Htc), ferritin, total protein, albumin, Parathormone

(PTH), vitamin D, magnesium (Mg), copper (Cu) and zinc (Zn) levels.

Results: Preoperatively, patients had a mean weight of 99.06 (range 77-143) kilograms, mean BMI of 33.1 (range 27.5-51.6) kg/m², and a mean HbA1c of 8.78% (range 6.1-11.4) %. In the postoperative 12th month evaluations, mean weight decreased to 76.02 kilograms, mean BMI to 25.2 kg/m², and mean HbA1c to 6.057%. Plasma Mg, Cu, albumin, PTH, ferritin, Hb, and Htc levels showed no change. Plasma protein and Zn levels showed modest, but insignificant decreases. Vitamin D levels showed significant changes (17.79 vs 40.38 ng/ml), and Vitamin B12 levels showed a significant decrease (450.3 vs 349.1 pg/ml). By the end of 12 months follow-up, only 5 patients (9.1%) required B12 replacement.

Conclusion: Transit Bipartition technique provided an efficient weight and glycemic control in type 2 diabetic patients without significant malabsorption. The decrease in Vitamin B12 levels might be related to the gastric sleeve.

A5181

Comparative Study of Efficacy for DM Control between Laparoscopic Duodenojejunal Bypass versus Laparoscopic Roux-en-Y Gastric Bypass – Three year follow up -

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Background: Mechanism of early diabetic control by bariatric surgery is still a question. Duodenal-jejunal bypass supports foregut theory. However its efficacy is not yet established, and needs more study.

Patients and methods: During the period from January 2008 to December 2009, patients who underwent Lap. duodenojejunal bypass or lap. Roux-en-Y gastric bypass due to type 2 diabetes regardless patients' body mass index were included. Patients with less than 3 year follow up period were excluded. Patients' base characteristics, change of body weight, HbA1c and diabetic treatments were analyzed.

Results: Totally 8 LDJB and 20 LRYGB patients were analyzed. There were more male patients included in LDJB group (LDJB 75% vs LRYGB 30%, p=0.030). Baseline BMI in LRYGB group was higher than LDJB group (LDJB 27.0+-2.5 vs LRYGB 32.6+-3.4, p<0.001). Age, DM duration, baseline HbA1c, c-peptide levels were similar. In the surgical results, longer operation time was needed in LDJB (LDJB 367.5+-120.2 vs LRYGB 232.9+-41.1, p<0.001), no difference in

hospital stay and complication rate. The significant decrease was observed regarding BMI and HbA1c in LRYGB than LDJB during 3 year of follow up. At the 3 year follow up period, DM remission rate was observed 40% in LRYGB group and 12.5% in LDJB group.

Conclusion: LDJB is not effective in control of diabetes compared with LRYGB. Foregut theory is reconsidered as a main mechanism of diabetic control of bariatric surgery.

A5182

Impact of visceral fat amount on Type 2 Diabetes improvement after gastrectomy

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Introduction: Metabolic surgery is an effective treatment option for T2DM. The indication of metabolic surgery is based on BMI despite of several limitations in evaluation of metabolic risk. Since visceral fat is highly associated with metabolic diseases, we estimated effectiveness of visceral fat proportion (VFP) for predicting metabolic risk.

Methods: Total of 55 T2DM patients with BMI ≤ 35 kg/cm² who underwent gastrectomy for gastric cancer were included. Pre- and post-operative VFP was measured using abdominal computed tomography scan data. Multivariate logistic regression analysis was performed to estimate effect of VFP in T2DM improvement. ROC analysis showed effectiveness of VFA proportion as a predictor of T2DM improvement.

Results: Thirty-six patients out of 55 (65%) showed postoperative T2DM improvement. Low preoperative VFP (OR = .910; 95% CI = .833-.995) and low glycated hemoglobin (OR = .380; 95% CI = .191 - .757; p = .006) are associated with T2DM improvement 2 years after gastrectomy. The area under ROC curve was 71.1% showing moderate accuracy.

Conclusion: T2DM patients who have low preoperative VFP may get T2DM improvement after gastrectomy. VFP is suggested as reasonable

predictor of T2DM improvement after gastrectomy for patients with BMI ≤ 35 kg/cm²

A5183

Body shape index as a new tool to predict mortality and metabolic disease incidence

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Introduction: Obesity has been defined based on Body Mass Index (BMI) even though BMI does not discriminate lean muscle mass and fat mass at the same weight, and does not reflect the distribution of fat. An alternative index to define obesity and predict the risk of metabolic diseases is required.

Methods: Body Shape Index (BSI) by eliminating the effect of height from weight: $BSI = WC / (weight)^{1/2}$ Of the 1,025,340 subjects from a National Sample Cohort database released by the National Health Insurance Service in Korea, 401,224 with a record of waist circumference (WC) were included.

Results: The incidence hazard ratios (HRs) for diabetes, hypertension, cardiovascular diseases (CVD), and hyperlipidemia according to BMI range groups rose with increasing BMI. The highest all-cause mortality HR was evident in the lowest BMI group (HR, 2.821) and the 26.5-28 kg/m² BMI group had the lowest mortality HR (HR, 0.822). BSI did not reveal such a paradox: the lowest mortality HR was found in the fourth BSI group (HR, 0.958) which is just below the reference BSI group, and the highest mortality was found in the highest BSI group (HR, 2.317).

Conclusion: In the Korean population, BSI is suggested as a better option in predicting the incidence of metabolic diseases without the obesity paradox in mortality, compared to BMI and WC. BSI appears to be the proper alternative predictor for the incidence of metabolic diseases and mortality in people with BMI < 35 kg/m²

A5184

Systematic Review of 5 year Diabetes Outcomes following Sleeve Gastrectomy in Populations with Obesity

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Background: There is a strong association between obesity and Type 2 Diabetes Mellitus (T2DM). While short-term results of Laparoscopic Sleeve Gastrectomy (LSG) and diabetes remission are promising, the long-term T2DM resolution rate following LSG is not well established. The aim of this paper was to systematically review the evidence on the efficacy of LSG on T2DM resolution.

Method: A comprehensive literature search was conducted through Medline, Embase, Scopus, Web of Science, Dare, Cochrane library, and HTA database. Conference abstracts and registered clinical trials were also searched, along with Google for other types of grey literature. The search terms used were sleeve gastrectomy, vertical gastrectomy, metabolic surgery and diabetes. Included studies reported 5-year follow-up of T2DM outcomes following LSG.

Results: Following a review of 664 abstracts, 11 studies (n=1354) met the inclusion criteria and were included in the systematic review. There were 402 (29.7%) of patients with T2DM. The mean preoperative BMI was 44.6 \pm 11.8 kg/m² for patients with diabetes. In patients with diabetes, post-operative BMI dropped an average of 15.5 kg/m² to 33.2 \pm 4.7 kg/m² at 5 years. Diabetes prevalence decreased post-operatively from 47% to 20.5% at 5 years. Diabetes remission occurred in 60.8% of patients. Mean plasma glucose levels and hemoglobin A1c values fell 58.3 mg/dl and 1.6% respectively at the 5-year mark. 5-year follow-up data was reported in 56% of patients.

Conclusion: The systematic review found that the diabetes remission rates at 5 years following LSG in patients with obesity is approximately 60%.

A5185

Type 2 diabetes remission rate after bariatric surgery in Hospital DIPRECA, CHILE.

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Background: Patients with type 2 diabetes benefit of weight loss and changes in lifestyle. Bariatric surgery has proven to be a good alternative in order to improve metabolic control, and, depending on certain factors, to promote the remission of the disease.

Objectives: To study 12, 24 and 36 months outcomes of patients with T2D treated with two different bariatric surgery techniques performed in Hospital DIPRECA. The techniques were Roux Y Gastric Bypass (RYGB) and Sleeve gastrectomy with jejunal bypass (SGJB).

Methods: Restrospective review of T2D patients from the original cohort of our center. Demographic information, type of surgery, diabetes medications, years of T2D diagnosis, presence of comorbidities, body mass index (BMI) before and after surgery, glycemia and HbA1c in each control were analyzed. Primary endpoint was to find the proportion of patients with complete remission at 12, 24 and 36 months. This variable was defined as fasting glycemia <100 mg/dl and glycated hemoglobin (HbA1c) \leq 6.0% without anti-diabetic medications for at least one year.

Results: Records of 110 patients with complete data were analyzed. 68 patients underwent SGJB and 42 underwent RYGB. Of all patients, 58,6%, 54,3% and 64% achieved complete remission after 12, 24 and 36 months after bariatric surgery.

Conclusion: Bariatric surgery has an acceptable remission rate at mid term in a single institution, with low risk of relapse at that follow-up

A5186

Impact of intensive dietician input on dietary patterns of patients undergoing bariatric surgery

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Introduction: The UK's national food guide, 'the eat well plate', defines the government's advice on a healthy balanced diet. The recommended proportions for a healthy diet are: Fruit and vegetables: 33%, Carbohydrates 33%, Milk and dairy 15%, Protein 12%, High fat/sugary foods 8%. The compliance of patients with the 'eat well plate' is not known. Also the effect of dietary advice intervention in the form of regular dietician review prior to surgery on the patient's eating habits and weight loss is poorly understood. Studies have reported

change in food preferences and taste patterns after bariatric surgery.

Methods: 112 patients referred for bariatric surgery were surveyed about the percentage composition of their dietary intake using the 'eat well plate' to obtain a baseline consumption of fruit & vegetable, carbohydrate, dairy, protein, and sugar & fat intake. Data of 45 patients from this group who had received dietary intervention in the form of dietician advice on the ideal diet composition prior to surgery and the resultant change in their portion composition were analysed. The change in dietary composition at the first clinic review 6-8 weeks after surgery in 14 patients were also analysed. Diet composition was converted to percentages and analysed as ordinal data with statistical analyses performed using GraphPad (Prism) software.

Results: In the 112 patients (Age:43 {19-76}; M:F = 44:78; Weight: 135.5 {86.9 - 250}; BMI :47.1 {35.2 - 71}), the mean dietary composition at presentation was 19.4% (sd+-14.1) for fruit & vegetable, 28.9% (sd+-15.4) for carbohydrate, 12.3% (sd+-8.7) for dairy, 20.5% (sd+-10.4) for protein, 18.9% (sd+-15.6) sugar & fat. The consumption of fruit & vegetable ($p<0.0001$), carbohydrate ($p=0.001$) and dairy products were significantly lower ($p<0.0001$) and the consumption of proteins ($p<0.0001$) and sugar & fat ($p<0.0001$) were significantly higher than the recommended levels (One sample T- test). Of the 45 patients who had dietary advice pre-operatively (Mean 3 consultations ; range 2-6), there was a significant increase in proportion of fruit and vegetables (mean=13.1%; $p=0.0001$), dairy products (mean=3.2%; $p=0.02$) and protein (mean=5.1%; $p=0.001$; Wilcoxon-signed-rank test). This was accompanied by a decrease in consumption of carbohydrates (mean=10.8%; $p<0.0001$), as well as sugar & fat (mean=10.1%; $p<0.0001$; Wilcoxon-signed rank). Over this same time period the weight of these patients showed a significant mean reduction of 5.3kg (95% CI 3.8-6.9); $p<0.0001$ (paired t-test). Of the 14 patients on whom data at first post operative follow up regarding dietary composition is available, a significant reduction was noted in sugar and fat composition post-operatively compared to pre-op baseline composition (CHI-squared test statistic=17.18; $p=0.0002$ (Friedman test)). Other changes in dietary composition were non-significant.

Conclusion: Pre-operative dietician input appears to help in the alteration of dietary composition in bariatric patients pre-surgery which may contribute to weight loss pre-op. The change in sugar and fat

composition after surgery is interesting as it lends credence to the suggestion that surgery alters the gustatory and taste preferences of patients which may have an impact on weight loss after surgery.

A5187

Limited Food Budget Affects Weight Loss Outcomes After Bariatric Surgery in an Appalachian

Population

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Background: Living in a rural Appalachian community can be limiting in food availability and variety. Furthermore, job opportunities are less numerous in rural Appalachian areas, resulting in less employment and more families living on limited income. The effects of residing in a rural Appalachian environment on weight loss surgical outcomes are not well defined.

Methods: We retrospectively reviewed bariatric surgeries performed in a university hospital in West Virginia from 10/2013 to 02/2015. Type of surgery, pre-operative weight, percent excess weight loss (%EWL) at 3 and 12 months post-operatively, and patient report of employment status and limited food budget at program start were collected. Significant differences among responses were determined by t-test.

Results: 34 patients were reviewed for limited food budget, of these, 30 had Roux-en-Y Gastric Bypass (RYGB) surgery and 4 had Sleeve Gastrectomy (SG). 32 patients were further reviewed for employment upon entrance into the program; 28 had RYGB and 4 had SG. Patient report of limited food budget significantly reduced 3 months post op %EWL ($p=0.02$), but not 12 months post op %EWL ($p=0.22$). However, patient employment status at program entry had no correlation to 3 month and 12 month post op %EWL ($p=0.12$ and $p=0.27$, respectively).

Conclusions: Rural bariatric patients in an Appalachian region have decreased food availability, which is further exacerbated by limited income, but not employment status. These factors influence postoperative weight loss. This study highlights the

need for more individualized nutrition education for lower income bariatric surgery patients to strive for equal weight loss outcomes.

A5188

The Incidence of Iron Deficiency Post Roux-en-Y Gastric Bypass and Sleeve Gastrectomy: A Systematic Review

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Introduction: Bariatric surgery provides effective long-term treatment of obesity and its associated comorbidities. The physiological and anatomical changes that occur as a consequence of surgery result in macro- and micro-nutritional deficiencies. Iron deficiency is one of the most common deficiencies post-bariatric surgery. It is important to quantify its risk in order to facilitate counseling, monitoring and treatment for bariatric surgery patients.

Aim: The aim of this systematic review is to quantify the impact of bariatric surgery on the incidence of iron deficiency. Data Source Databases including Ovid Medline, Ovid Embase, Helthstar, Scopus, Cochrane (CDSR), LILACS, DynaMED, ClinicalKey, TRIP+, OTSeeker, Johanne Briggs Institute, AMED were searched for original articles. An additional snowballing search was undertaken. Search terms included Obesity, Nutrient deficiency, Iron deficiency, Iron deficiency anemia, Bariatric surgery, Roux-En-Y Gastric Bypass and Sleeve Gastrectomy. Studies were included if they described outcomes for Roux-en-Y Gastric Bypass (RYGB) or laparoscopic sleeve gastrectomy (LSG) on serum iron or ferritin level and anemia before and after the surgery, with an adequate follow up of at least one year. Two investigators reviewed each study and a third resolved study inclusion disagreements.

Study: Selection Original articles reporting the incidence of iron deficiency and anemia pre and post Roux-en-Y Gastric Bypass (RYGB) and laparoscopic sleeve gastrectomy (LSG) from January 2000 to January 2015 were selected.

Data Extraction: Data extraction from selected studies was based on protocol-defined criteria that included study design, methods, patient characteristics, surgical procedure, pre- and post-

operative incidence of iron deficiency/anemia as well as risk factors for iron deficiency following bariatric surgery.

Data Synthesis: Out of the 1133 articles screened, 12 studies were analyzed. This included 7 prospective studies, 4 retrospective studies and one randomized controlled trial. Six studies included RYGB cohorts and 4 included LSG cohorts. Two studies compared LSG to RYGB. Data pooling was precluded due to observed heterogeneity in patients, interventions, or outcome measures. The incidence of iron deficiency ranged from 5.9% to 20% preoperatively and 4.9% to 37.2% postoperatively (Table 1). The incidence of postoperative iron deficiency was 6.6% to 20% for LSG and 7.7% to 37.2% for RYGB when the two procedures were analyzed separately. One study observed no difference in the incidence of iron deficiency by type of surgery. One randomized controlled trial did not find a significant difference in the incidence of postoperative iron deficiency between LSG and RYGB (18% vs 20%, respectively, $p > 0.5$). Four studies did not find any significant difference in the incidence of iron deficiency before and after surgery. Four studies reported an increase in the incidence of iron deficiency anemia postoperatively and 4 studies did not. The change in the incidence of iron deficiency anemia was from 1.5% to 6% preoperatively to 20% to 23% post-RYGB. Seven studies reported prophylactic iron supplementation for patients postoperatively and 2 studies reported therapeutic iron supplementation for iron deficient patients. Iron dosage varied from 7mg to 80mg per day across studies. Risk factors for iron deficiency were found to include: premenopausal females (5 studies), duration of follow-up, and preoperative iron deficiency. Conclusion Iron deficiency is frequent in people with obesity and should be treated preoperatively. The level to which patients should be supplemented is not yet established and careful nutritional surveillance is important. This is particularly true for premenopausal females and those with preexisting iron deficiency. Systematic Review Registration PROSPERO 2015:CRD42015019271 (www.crd.york.ac.uk/PROSPERO).

A5189

Refractory Malnutrition after Bariatric Surgery is Successfully Rescued with Feeding Tube Placement

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Background: Bariatric surgery has been shown to improve survival for patients with obesity and decrease the incidence of comorbid conditions. Most patients benefit significantly from the resultant weight loss. However, there is a small risk of refractory malnutrition that can have significant associated morbidity. The objective of this study was to evaluate bariatric surgery patients who received a gastric or jejunal feeding tube after their initial surgery in order to identify unique differences in this cohort and evaluate outcomes after feeding tube placement. We hypothesized that patients with malnutrition after bariatric surgery would benefit from feeding tube placement and nutritional support.

Methods: A previously validated institutional database and administrative data was used to identify all patients undergoing bariatric surgery between 1985-2015 and determine which patients received a feeding tube postoperatively. Detailed chart review was performed to assess demographics, bariatric operative details, feeding tube indications, and resultant body mass index (BMI) changes. Chi-square analyses for categorical variables and appropriate parametric and nonparametric tests for continuous variables were completed with a significance level set at 0.05.

Results: A total of 3,487 patients underwent bariatric surgery during the study time period, of which 139 (3.9%) patients required placement of a gastric or jejunal feeding tube postoperatively. Of patients with a feeding tube placed, the median age was 44 years, the median pre-bariatric surgery BMI was 50.9 kg/m², and the mean time from bariatric surgery to tube placement was 45.1+-67.5 months. Of these patients, 128/139 (92%) had a Roux-en-Y gastric bypass (RYGB) and 11/139 (8%) had a restrictive procedure. Indications for postoperative tube placement included malnutrition, dysphagia/dehydration, access for ERCP, obstruction, hypoglycemia, anastomotic leak, ulcer/perforation, SMA syndrome, stroke, and trauma. A total of 24 patients had a feeding tube placed for the treatment of refractory malnutrition, all of which had a RYGB. Tubes placed for malnutrition were more likely to be placed laparoscopically (15/24 [62.5%]) into the gastric remnant (17/24 [70.8%]). Compared with other

indications for tube placement, malnutrition patients were younger (40.6+-9.9 vs 45.3+-9.7 years, p=0.032) and had a significantly lower mean BMI prior to tube placement (20.2+-6.0 vs 38.2+-13.6 kg/m², p<0.0001), however there was no statistical difference in pre-bariatric surgery BMI (47.5+-10.5 vs 51.4+-9.5 kg/m², p=0.07). Patients with malnutrition had tubes placed later in their postoperative course (80.3+-76.1 vs 37.8+-63.5 months after bariatric surgery, p<0.001) and had a higher percent reduction in excess BMI (126.2+-31.9 vs 52.5+-44.3%, p<0.0001). The duration of feeding tube use from placement to removal was longer (40.2+-67.0 vs 16.3+-28.5 months, p=0.056) and the number of patients who were eventually weaned from nutritional support was lower (37.5% [9/24] vs 58.3% [67/115], p=0.063), both of which trended toward significance. Malnutrition patients did have a statistically significant increase in mean BMI after tube placement compared to patients receiving a tube for other indications (14.5+-20.9 vs -13.0+-14.0%, p<0.001) as seen in Figure 1. Additionally, compared to the population receiving feeding tubes, the dysphagia/dehydration patients were more likely to have the tube removed (76.2 vs 50.8%, p=0.03) and have less percent reduction in excess BMI prior to tube placement (50.9+-27.0 vs 67.8+-53.5%, p=0.03), with no other differences identified (all p>0.05).

Conclusion: Patients with refractory malnutrition after bariatric surgery benefit from gastric or jejunal feeding tube placement, which significantly increases their BMI. Severe malnutrition after bariatric surgery affects a small but significant proportion of the population and can be successfully resolved with feeding tube placement, even though these tubes are required for a long duration. It is important to provide outstanding multidisciplinary support and manage patient expectations when dealing with this complex population. Dysphagia/dehydration represents a separate unique subset of patients that also benefit from feeding tube placement, but are more likely to resolve their symptoms and have their tube removed.

A5190

Effects of a ketogenic diet with Mav ketofast pro supplement in the preoperative phase of bariatric surgery

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The aim of this study was to evaluate retrospectively body composition changes and the efficacy and safety of ketogenic diet with MaV ketofast pro using nasogastric tube. The length of treatment is 10 days. Methods The study was conducted outpatient in collaboration with bariatric surgeon from Bucharest. The cases analyzed for this study were selected from 53 patients during 3 years all proposed for bariatric surgery. Upon acceptance patients were separated randomly in a ketogenic group or a standard low calories diet (control group) but both groups being on a VLCD. Anthropometrics - measurements evaluated were: height, weight, BMI and %EWL and visceral fat (baseline and after 10 days) using Philips Envisor HD. The patients' ages varied from 27 to 62 years (with a mean age of 38.2 years). The average weight at the start of the treatment for all patients was 153.6 kg and was higher for men than women. The mean BMI was 44.7 kg/m² and was also higher in the men than in the women. The men had a very high body cell mass (BCM) compared with the women (48.1 kg versus 28.3 kg), however, the average fat mass (FM) was nearly the same for men and women (50.3 kg versus 49.3 kg). Results After 10 -days of ketogenic diet with MaV ketofast pro patients lost an average of 15.6 kg of body weight 4.2 kg of BCM, 11.3 kg of FM, and 2.8 kg of TBW compared with control group where the average of weight loss was 6,2 kg, 1,5 kg of BCM, 4,5 of FM and 0,8 kg of TWB. Regarding measurement of visceral fat the reduction was 23.1 mm. Conclusions This study demonstrates that ketogenic diet with MaV ketofast pro, administered for a cycle of 10 days can induce rapid weight loss and a very good visceral fat loss. After 10-days patients lost an average of 8.1% of their initial body weight. Comparing with a normal VLCD weight loss is increased. The nasal tube is well-tolerated and complications during the nasal insertion and treatment are very low and generally tolerable. The method is fast and safe.

A5191

Pre and Post Operative Comparison of Comprehensive Metabolic Profile with Vitamin Levels in Patients undergoing Modified Duodenal Switch (MDS) Abstract

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Background: Weight loss has been the main focus in bariatric surgery; however, bariatric surgery also plays an important role in modifying nutritional status of patients. The post-operative nutritional outcome can be an improvement or decline for the patients. Previous studies have assessed the risks not only of obese patient having malnutrition but also a linkage between bariatric surgery and various forms of malnutrition. The aim of this study is to investigate whether patients suffer nutritional imbalance after clinical adaptation from the MDS procedure.

Methods: A total of eighty-three patients consist of 70% primary MDS (n=58), 20% revision laparoscopic adjustable gastric banding (LAGB) to MDS (n=16) and 10% conversion vertical sleeve gastrectomy (VSG) to MDS (n=9) from 2013-2016 were retrospectively observed. For 24 of 60 patients post-operative laboratory values were available that were greater than 6 months. All patients had a single anastomosis reconstruction with a 3 meter efferent limb.

Results: Mean age for all MDS patients was 43 (SD=11.7), consisting of 36% males (n=30) and 64% females (n=53). The pre-operative lab values included a random blood glucose level (RBG) mean of 117mg/dl (SD=67) (normal range: 79-140), and a hemoglobin A1c (HbA1c) mean of 6.4% (SD=1.6) (Normal range of 4-4.6%). Post-operative lab values were divided into two categories: day since surgery (DSS) 1-180 days and DSS more than 180 days. DSS 1-180 days unveiled improvement of RBG (mean=90.2, SD=17.2), and HbA1c (5.432, SD=0.51).

Improvements were also seen in triglycerides, cholesterol, (low density lipoprotein) LDL and (high density lipoprotein) HDL level (mean=135 SD=47.16, mean=148.25 SD=31.99, mean=86 SD 34.2, mean=43.6 SD=12.6). DSS >180 days showed continuous improvement of RBG (mean=83.63, SD=20.3), HbA1c (5.23, SD=0.4), triglycerides, LDL and HDL level (mean=85.5 SD=34.9, mean=81.2 SD 28.2, mean= 53.2 SD=15.9). Pre-operative assessment of Vitamin D had a mean value of 24 (SD=9), with the majority of patients being deficient. Both Vitamin A and Albumin were normal pre operatively and at DSS > 180 days. At DSS > 180 days mean Vitamin D increased to 29ng/mL (SD=9). Iron, (Fe) also increased in the post op patients.

Conclusion: Although based on 24 patients of a potential 60, this study shows that by increasing the common channel length to 3 meters can result in

improvement of glucose and cholesterol and still allow for adequate absorption of fat soluble vitamin levels. It is impressive that Vitamin D levels actually increased more than 6 months after surgery. Certainly longer investigation with more complete follow up is required.

A5192

Pre-operative Micronutrient Status Prior to Bariatric Surgery

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Background: Micronutrient deficiencies prior to bariatric surgery contribute to post-operative micronutrient deficiencies. It is common for certain vitamins and minerals to not be assessed prior to surgery, such as copper, zinc, and fat soluble vitamins. The aim of this study was to determine the prevalence of pre-operative micronutrient deficiencies after the implementation of a new pre-operative vitamin and mineral assessment protocol that included copper, ceruloplasmin, zinc, RBC folate, vitamin A, and magnesium.

Methods: Micronutrient status was diagnosed by blood analysis in patients considering bariatric surgery from February-April 2016 at a tertiary academic hospital. Laboratory values were regarded as low (deficient) or high when they did not meet the reference values determined by our clinical laboratory. Low normal and high normal ranges were based on the bariatric program's laboratory protocols. As standard of care, patients are not advised to take multivitamin and mineral supplements prior to surgery; however, those patients choosing to take supplements prior to surgery were not excluded.

Results: Of the 106 patients who obtained blood analysis, the mean BMI for pre-operative patients was 44.16±9.4 (mean ± standard deviation). The average age was 44±13 and 76% of the patients were female, reporting common bariatric comorbidities such as hypertension, diabetes, hypercholesterolemia, obstructive sleep apnea, and GERD. The sample size of patients completing blood analysis for each vitamin and mineral differs, as some patients did not receive lab orders for all vitamins and minerals; regardless, elevated values and deficiencies were found. PTH was reported elevated in 32.9% (32/97) of patients, while 18.44% (19/103) had low normal calcium and 6.8% (7/103)

had low calcium. HgbA1c readings were considered high for 43.01% (43/90) of patients. Ferritin and serum iron status was normal in 86.32% (82/95) and 86.69% (87/97) of patients, respectively. Low hematocrit and hemoglobin levels were demonstrated in 16.33% (16/98) and 17.48% (18/103) of patients, respectively. There were 2.63% (2/76) patients with low RBC folate and 0.00% (0/24) with low serum folate. Serum thiamin was low in 7.59% (6/79) of patients. Meanwhile copper and ceruloplasmin levels were low for only 1.07% (1/92) and 1.11% (1/90) of patients, respectively. Ceruloplasmin was low normal for 16.67% (15/90) of patients and copper was elevated in 34.78% (32/92). Vitamin A was low in 13.98% (13/93) of patients and vitamin B12 was low in 5.15% (5/97). Magnesium was high in 13.33% (12/90), low normal in 8.89% (8/90), and low in 2.22% (2/90) of patients, respectively. Low vitamin D levels were reported in 49.5% (50/101) of patients, while 18.8% (19/101) had low normal values and 31.7% (32/101) had normal values. Lastly, a zinc deficiency of low [28.57% (26/91)] or low normal [16.48% (15/91)] levels was found in 45.05% (41/91) of patients. Of those patients with a low or low normal level of zinc, 85% had a BMI above 40. Pearson correlation showed a significant negative correlation between vitamin D status and BMI ($r(100)=-0.25$, $P<0.05$), while deficient levels of zinc were not statistically correlated with BMI ($r(89)=0.15$, $P<0.15$).

Conclusion: A moderate number of deficiencies were identified in bariatric patients pre-operatively, with the most deficiencies prevalent for vitamin D, ceruloplasmin, vitamin A, magnesium, and zinc. There was a significant correlation between vitamin D deficiency and higher BMI, though the correlation is weak. It has been questioned in the literature whether the inflammatory state of obesity may influence zinc status, yet we did not find a significant association between zinc status and BMI. In addition, using RBC folate did not significantly increase the prevalence of folate deficiency. Also, a moderate number of patients demonstrated either elevated or low values of magnesium. It is important to note that a large number of patients had low or low normal zinc values prior to surgery, which had previously not been regularly assessed prior to the implementation of a new pre-operative laboratory protocol for bariatric patients. These deficient patients would have gone undetected prior to surgery, which could have negatively influenced their post-operative micronutrient status. Patients with deficiencies prior to surgery were prescribed

vitamin D supplementation, were asked to start taking a complete multivitamin with minerals and encouraged to focus on the zinc, copper, and vitamin A composition of the vitamin and mineral supplement. This also provided an opportunity for further education about the importance of taking the appropriate type of vitamin and mineral supplements after surgery.

A5193

Association Between Post-Operative Iron Deficiency and Weight Loss After Roux-en-Y Gastric Bypass

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Introduction: Iron deficiency is common in obese individuals as well as a recognized nutritional complication of bariatric surgery. Both obesity and ferritin elevation are associated with inflammatory conditions. Only 62% of pre-surgical patients have normal hemoglobin (Hgb) and ferritin (F), indicating a high prevalence of abnormal iron nutrition in obese patients. Molecular associations between severe obesity, low-grade inflammation, and iron metabolism may contribute to this relationship between obesity and iron deficiency. Moreover, pre-operative iron deficiency has been previously shown to be associated with impaired weight loss following bariatric surgery. This study aimed to further evaluate the relationship between iron depletion or deficiency and surgical weight loss.

Methods: Of 3097 research-consented patients who underwent Roux-en-Y Gastric Bypass (RYGB) or Sleeve Gastrectomy (SG) between 2004 and 2013, 2660 patients had an iron panel including Hgb and F drawn together preoperatively. Out of this group, 1183 of those patients had normal pre-op values and had iron labs drawn in the first year after surgery. This cohort was further divided into three groups: patients who developed low Hgb and/or F in the first 6 months after surgery (n=234, Group I); patients who developed abnormal lab(s) between 6 and 48 months after surgery (n=407, Group II); and patients who maintained normal values for the first four years postoperatively (n=542, Group III). The percentage excess weight loss (% EWL) was measured at 6 months postoperatively, at weight loss nadir, and at <u>>/u>36 months postop. In an additional analysis, the same groups were studied in

relation to the occurrence of a dangerously low Hgb (<10mg/dL).

Results: Group II, who developed abnormal iron values after 6 months, lost more excess weight than the Group III (normal) patients, both at nadir (85 vs 76%, p<0.0001) and <u>>/u>36 months (70 vs 60%, p<0.0001). Group I patients, who developed abnormal values within 6 months, also lost more weight than Group III at nadir (80%) and at <u>>/u>36 months (66%), but the differences were not statistically significant. The weight-loss trends were very similar across all groups when the analysis was limited only to those who developed dangerously low hemoglobin. Patients whose Hgb reached <10mg/dL within 6 months lost 83% EWL at nadir and 70% overall, whereas patients whose Hgb decreased after 6 months lost significantly more excess weight than the normal group at the nadir (86%, p<0.0004) and overall (72%, p<0.0001) (Table 1).

Conclusion: The beneficial effects of bariatric surgery, including weight loss and the improvement or remission of co-morbid disease, have been known for decades. However, micronutrient metabolism after various bariatric procedures and its relation to weight loss remain poorly understood. Our previous studies of iron metabolism have demonstrated that the risk of iron deficiency after RYGB persists for up to ten years. This study demonstrates an association between significant iron deficiency after 6 months postoperatively and greater weight loss, indicating that, while the procedure is relatively fixed, individual differences in caloric absorption are also reflected in iron absorption. Therefore, patients who approach their goal weight loss via caloric restriction should also be monitored closely for micronutrient malabsorption or restriction. Further evaluation of the effects of iron replacement on weight would determine whether iron metabolism also has an effect on weight regulation.

A5194

Muscle strength and Lean body Mass Evaluation among Roux-en-Y Gastric Bypass patients

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Introduction: Bariatric surgery is considered the best treatment for clinically severe obesity. However, it is known that after Roux-en-Y Gastric Bypass (RYGB)

due to low protein intake and rapid weight loss patients can develop a severe loss of muscle mass. This situation can lead to sarcopenia, defined by progressive and widespread loss of skeletal muscle mass and strength concomitantly with increased risks of physical disorders and poor quality of life.

Objective: To evaluate important components for the development of sarcopenia, such as the strength and lean body mass in patients submitted to RYGB.

Methodology: This is a cross-sectional study of three groups of adult patients: 1) Patients with clinically severe obesity (pre-operative patients) 2) Patients that had RYGB in less than 12 months, 3) Patients post-RYGB with 12 months or more of surgery. All subjects were submitted at one time to an examination of multifrequency bioelectrical impedance and a power measurement test using a dynamometer (MG4800 Ottoboni). Statistical tests comparing averages and correlations were applied to analyze the data.

Results: We evaluated a total of 36 patients; we had 10 patients in the obese group (Men: 10%; women: 90%) (BMI: 42.7 +- 5.7 kg / m²), 7 patients in the group with less than 12 months post operative (all women) (time since surgery: 3.71 +- 2.62 months) and 19 patients in the group with more than 12 months of surgery (men: 16%; women: 84%) (time since surgery: 47.05 +- 31.17 months). There was no significant correlation between strength (kg) and Muscle Mass (kg and the total weight%) in both groups. There was no correlation between % fat and strength (kg) in the clinically severe obesity group ($r = 0.57$; $p = 0.08$). The post-operative group with more than 12 months showed strength (kg) significantly higher than in the other two groups (strength : among < 12 months post-operative: 30.8 +- 7.8 kg; patients with obesity 25.2 +- 7.3 kg, post-operative with more or equal 12 months: 23.8 +- 5.4 kg; $p = 0.04$). The prevalence of physically active patients was significantly higher both: in the post-operative group with less than 12 months surgery (Sedentary: 71.4%; underactive: 28.6% and physically active : 0%) and in the group of patients with 1 year or more of surgery (sedentary: 47.4%; underactive: 21.1% and physically active: 31.6%) compared to the clinically severe obesity group (sedentary: 100%). The post-operative group with 1 year or more of surgery also had the highest prevalence of active patients and less sedentary ($p = 0.031$).

Conclusions: Patients submitted to RYGB can be positively be associated with increased muscle strength, mainly among patients who adhere to

regular physical activity. Regular physical activity and possibly adequate protein supplementation can protect bariatric patients from sarcopenia. However, prospective studies are needed to confirm these hypotheses.

A5195

Association between depression and nutritional deficiencies among Roux-en-Y Gastric Bypass patients

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Introduction: Obesity population is a group of increased risk for developing depression. Bariatric surgery is now the best treatment for obesity. Although data showing the prevalence of depression after the surgery are limited, there is some evidence showing some relief of symptoms after surgery. Patients after bariatric surgery are in risk to develop nutritional deficiencies. Sometimes the symptoms of nutritional deficiencies can be confused with symptoms of depression, such as weakness, listlessness, lack of appetite, mental confusion and others.

Objective: To evaluate the prevalence and level of depression in patients after bariatric Roux-en-Y Gastric Bypass (RYGB) surgery and correlate this data with possible nutritional deficiencies prevalence.

Methodology: This is a cross-sectional study which was carried out an analysis of medical records of patients who underwent RYGB surgery, The population had more than 2 years after the procedure. Patients filled the Hamilton questionnaire depression evaluation scale in the pre-operative moment to assess the presence and level depression. After the analysis, the same group was contacted by phone, when we applied the same questionnaire, but in the post operative moment. They were also asked to collect biochemical blood tests looking for nutritional deficiencies before and after surgery, e.g hematocrit, hemoglobin, iron, ferritin, vitamin B12, vitamin D, Zinc, Selenium, Copper, calcium, total protein and albumin. Statistical tests comparing averages and correlations were applied for data analysis.

Results: We analysed 35 medical records. Ninety percent of the population was female. The

prevalence of patients classified as no depression was significantly higher in post-operative group than in the obese group (Post: 52.8%; With obesity: 19.1%). The prevalence of mild to moderate depression was 33.4% in the post-operative group and 70.4% in the obese group ($p = 0.02$). At the pre-operative moment, there was a trend of lower levels of vitamin D among patients classified with some level of depression in relation to patients classified without depression ($p = 0.09$). In this same group, total cholesterol levels were lower in the group of patients classified as not having depression compared to other groups with any level of depression ($p = 0.03$). Hematocrit levels in the immediate post-operative moment (less than 6 months of surgery) and late (more than 2 years of surgery) were significantly higher in the group of patients classified as no depression (less than 6 months post-operative: $40.57 \pm 2.75\%$, > 2 years post-operative: 40.08 ± 1.29) compared to those classified with mild or moderate depression (less than 6 months post-operative: $13.65 \pm 0.06\%$, > 2 years post surgery: 32.5 ± 11.96) ($p < 0.01$ for both).

Conclusions: Hematocrit levels may be associated with the presence and level of depression in RYGB postoperative patients. Professionals should be careful of nutritional deficiencies as a factor that can enhance depression symptoms.

A5196

Wernicke's Encephalopathy After Sleeve Gastrectomy: Case Report and Review of Risk Factors, Clinical Presentations and Therapy

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Background: Wernicke's encephalopathy (WE) was first described in bariatric surgical patients in 1981. Over the past 3 decades, over 95% of cases of WE after bariatric surgery involved gastric bypass operations (1). Sleeve gastrectomy (SG) has recently become the most commonly performed bariatric procedure in the United States. 7 cases of WE have been reported in the world literature after sleeve gastrectomy since 2007 (2). We report an 8th case of WE post SG and review the risk factors, various clinical presentations and outcomes seen to date.

Methods: Patient data was reviewed from a prospective bariatric database at a tertiary medical center. Literature search was done of Medline, Embase and abstract collections. Clinical risk factors, neurologic presentations and imaging, laboratory studies and outcomes were compared and reviewed.

Results: WE has been reported in 8 cases to date in the world literature after sleeve gastrectomy, which is now a rapidly growing bariatric surgical procedure. The only consistent risk factor to date is persistent vomiting, but of variable length. The classic triad of clinical symptoms and signs of WE were rarely present. Neurologic imaging results were also variable. An undiagnosed chronic cholecystitis was an additional risk factor identified in our SG patient. High dose thiamine therapy has been shown by others to have efficacy (1) and proved helpful in our case.

Conclusions: WE has been reported in 8 cases to date in the world literature after sleeve gastrectomy. The variety of the clinical variables warrants a high index of suspicion by the bariatric surgeon and physician of this potentially fatal and debilitating disorder. 1. Wernicke's Encephalopathy after Sleeve Gastrectomy. Sharabi et al. *Israeli Medical Association Journal* 2012. A Fatal Case of Wernicke's Encephalopathy after Sleeve Gastrectomy for Morbid Obesity. Manakis et al. *Case Reports in Surgery* 2014

A5197

Doctor, Why Do I BARF? Hiatal Hernias As A Cause of Chronic Bloating, Abdominal Pain, Reflux, Regurgitation and Food Intolerance in Patients With A History of Bariatric Surgery

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Introduction: More bariatric procedures are being performed today than ever before. Many patients develop vague non-specific symptoms following bariatric procedures, presenting months to years after the index operation. Symptoms may include a combination of bloating manifested as nausea and vomiting, abdominal pain, reflux or regurgitation, and food intolerance or dysphagia (BARF). Hiatal hernias have long been associated with morbid obesity. Most hiatal hernias are asymptomatic, but many are repaired during the index bariatric procedure when done for morbid obesity. When symptomatic, operative repair is indicated. Hiatoptasty in the post-bariatric population is under-reported. We describe symptoms before hiatal hernia repair in this patient population, further discussing their symptom resolution and sub-dividing them by type of index bariatric procedure.

Methods: All repairs were done at a single institution over a three year period. 27 patients matched the required criteria, 12 underwent a prior laparoscopic roux-en-Y gastric bypass (LRYGB), 9 a laparoscopic sleeve gastrectomy (LSG) and 6 a laparoscopic adjustable gastric band (LAGB).

Demographics obtained include age, gender, pre-index procedure BMI, pre-hiatal hernia repair BMI, post-hernia repair BMI, follow-up (months) and associated morbidity. Furthermore, pre-operative and post-operative symptoms of nausea, vomiting, dysphagia to solids and liquids, reflux and abdominal pain were recorded and further subdivided by the different operations performed. All hiatal hernia repairs were performed laparoscopically, with posterior cruroplasty after circumferential hiatal dissection. 3 patients required biologic mesh repair.

Results: The most common presenting symptoms were nausea (93%), reflux (93%), vomiting (82%), dysphagia to solids (82%), abdominal pain (74%) and dysphagia to liquids (40.7%). Following repair, the proportion of complaints diminished as follows - reflux (25%), abdominal pain (25%), nausea (8%), dysphagia to solids (8%), vomiting (4%), and dysphagia to liquids (4%). Diagnostic modalities used include a combination of Upper endoscopy (56%), upper gastrointestinal series (56%) and abdominal computed tomographic imaging (CT) (37%). Mean age at time of hiatal hernia repairs was 56 years, with an average presentation of 7 years following the index operation. Average pre-bariatric surgery BMI was 46 kg/m², pre-hiatal hernia repair BMI was 32 kg/m², and post-hiatal hernia repair BMI was 31 kg/m². 78% of patients required anti-reflux medications prior to surgery, and decreased to 33% following repair. Mean follow-up was 6 months. Findings are further subdivided by index operation. Laparoscopic repair of the hiatal hernia improved symptoms in most patients including reduction in use of anti-reflux medication.

Conclusion: Hiatal hernias have a well documented association with morbid obesity. Denovo hiatal hernia repairs after bariatric surgery is uncommon, and symptoms may be difficult to differentiate from overeating or maladaptive eating habits. Diagnostic modalities are helpful in identifying the cause, and manometry may be helpful but may be inaccurate when identifying the gastroesophageal junction is difficult, particularly in this patient population. Most patients had resolution of symptoms. Development of esophageal dysmotility in this patient population

may take longer to resolve and may possibly be permanent. Longer follow-up, a larger patient cohort and evaluation of postoperative upper GI studies at different intervals post-operatively would help shed more light on upper gastrointestinal symptoms in the post-bariatric surgery population.

A5198

The Safety and Effectiveness of Totally Robotic Revisional Bariatric Surgery

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Background: Patients undergoing secondary bariatric procedures and revisions, in comparison to primary surgeries, are at higher risk for mortality and morbidity, including the risk for gastrointestinal leaks. The da Vinci robotic surgery system, with its ergonomic advantage, 3-D vision and tremor control may improve operative outcomes for high risk patients. To our knowledge, there are currently no studies of the safety and effectiveness of 'totally' robotic procedures for revisional bariatric surgery. In this study, we report on the surgical outcomes and rates of morbidity and mortality of a relatively large number of revisional bariatric procedures performed 'totally' robotic.

Methods: A retrospective analysis of a prospectively maintained database was performed and included 156 revisional surgeries performed by a single surgeon at a center of excellence hospital. The operations performed were grouped as follows: Group 1 Conversion to Roux-en-Y Gastric Bypass; RYGB (n=74 band to RYGB one-stage, n=12 band to bypass two-stage, n=11 sleeve gastrectomy to RYGB, n=21 vertical banded gastroplasty to RYGB, n=1 jejunoileal bypass reversal to RYGB, n=2 Billroth II to RYGB, n=1 Billroth I to RYGB, 5 Nissen to RYGB, 1 horizontal gastroplasty to RYGB, n=1 mini bypass to RYGB), Group 2 Gastrojejunal Anastomotic Revision (n=23), Group 3 Surgery Reversal (n=2 RYGB reversals), Group 4 Other Surgeries (n=1 band to sleeve; n=1 partial gastrectomy for possible fistula). In addition to the respective revisional operation, there were numerous additional procedures performed for repair of hiatal, incisional, umbilical hernias, for lysis of adhesion, partial gastrectomy, pouch reduction, cholecystectomy. Outcome measures included operative time, blood loss, length of stay (LOS), 30-day readmissions for malaise or

physical complications, 30-day reoperations, and mortality.

Results: For all surgical procedures, total time in surgery was 190.2+-74.9 min (range = 40 to 517 min). Operative times were lowest for surgeries involving conversion to band or sleeve (162 min) and highest for gastrojejunal anastomotic revision (236 min). For all patients, the mean duration of hospital stay was 3.34+-3.64 days (range = 1 to 30 days). Perioperative, there were no conversions to open surgery, no leaks, and no mortality.

Postoperatively, there were 0% mortalities, 0% anastomotic leaks, and 0% strictures (30-day). The total 30-day readmission rate was 10.25%. Half of these (n=8 or 5.12%) were for malaise (nausea and vomiting, dehydration, constipation, benign pain or issues, failure to follow diet) and 8 or 5.12% represented physical complications including 2 ulcers, 1 cystic duct obstruction, 1 fever with abscess, 1 obstructed G-tube, 1 dilated remnant, 1 atrial fibrillation, 1 contact dermatitis). The 30-day reoperation rate was 3.2%, i.e. 4 surgeries during the hospital stay (2 evacuations of hematoma, 1 exploratory laparoscopic surgery, 1 perforated remnant) and one 30-day laparoscopic cholecystectomy.

Conclusion: Utilization of the da Vinci surgery system for 'totally' robotic revisional bariatric surgery is safe and may be effective in lowering surgical risks and complications.

A5199

INDICATIONS AND OUTCOMES IN PATIENTS UNDERGOING GASTRIC BYPASS REVISION SURGERY

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Background: Although gastric bypass is considered to be a durable procedure, a subgroup of patients may require revision surgery over time for various reasons. As our Bariatric surgery practice is the main referral center in our region we have developed considerable experience with revision surgery. We sought to identify the indications, methods and outcomes of gastric bypass revisions performed at our institution.

Methods: A retrospective review of gastric bypass patients who required subsequent revision from January 2010 to December 2015 was performed. Data collected included demographics,

comorbidities, technique of reoperation, post-operative complications and weight loss outcomes.

Results: Out of 3917 primary bariatric surgeries during the study period, 79 gastric bypass revisions (2%) were performed. Mean age of patients was 51.85 with 70 (88.6%) females and 9 (11.4%) males. Mean pre-revision BMI was 42.09 and median time to reoperation was 18.4 +/- 9.7 years. Indications for revisions included 59 (77.7%) for weight regain, 13 (16.5%) for chronic pain/refractory marginal ulcer, 5 (6.3%) for bile reflux, 1 (1.2%) for malnutrition and 1 (1.2%) for Foreign body erosion. Reasons for weight regain included enlarged pouch in 33 patients, gastro-gastric fistula in 23 and short roux limb in 3 patients. Median OR time was 152.5 minutes. Nine patients (11.2%) had post-operative complications including 4 small bowel obstructions, 1 gastro-jejuno-stomy anastomotic leak, 2 wound infections, 1 bleeding requiring splenectomy and 1 narcotic overdose. Five patients (6.2%) required reoperation and one death occurred due to narcotic overdose. Mean Excess Weight Loss (EWL) trends for patients who underwent revision for weight regain were 22.48% at 3 months, 35.37% at 6 months and 39.46% at 1 year.

Conclusions: Gastric bypass revisions are challenging procedures known to have a higher incidence of post-operative morbidity compared to primary bariatric surgery procedures. However, in appropriately selected patients revision surgeries after gastric bypass leads to improvement of symptoms and significant weight loss.

A5200

Laparoscopic Revision of Gastrojejunostomy for Weight Recidivism after Roux-en-Y gastric Bypass

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Background: Weight recidivism and regain due to a wide gastrojejunostomy (GJ) after Roux-en-Y gastric bypass (RYGB) is now seen more frequently after long-term follow-up. We studied the feasibility and safety of a novel approach of laparoscopic revision of gastrojejunostomy (LRGJ) for large GJ stomas after RYGB associated with weight recidivism.

Methods: From November 2013 to February 2016, patients who experienced weight recidivism following RYGB with a documented large GJ and

underwent LRGJ were retrospectively analyzed. Data included patient demographics, weight before RYGB, lowest weight attained, preoperative weight and body mass index (BMI), operative time, hospital stay, conversion rate, mean follow-up, BMI loss, percentage excess weight loss (%EWL), reoperation rate, morbidity, and mortality.

Results: During the study period, 8 patients underwent LRGJ for dilated stomas after RYGB. All patients were female. The mean age was 45.6 ± 6.9 years, mean BMI before RYGB and before revision were 56.5 ± 7.9 kg/m² and 43.5 ± 9.3 kg/m², respectively. Indication for revision in all patients was failure to maintain weight loss and weight regain despite following strict dietary guidelines. The mean time interval between RYGB and LRGJ was 104 ± 23.8 months. The mean operative time and hospital stay were 79.4 ± 5.7 min and 1.1 ± 0.4 days, respectively. All GJ revisional procedures were carried out laparoscopically. The mean follow-up was 12.5 months (range 3 to 29 months). There were no postoperative complications, reoperations or deaths in this cohort. At the latest follow-up, mean postoperative weight loss after revision was 12.6 ± 7.8 kg, BMI was 38.8 ± 7.4 kg/m², mean total weight loss was 46.7 ± 12.9 kg and the mean %EWL was 56.3 ± 15.3 % (vs. %EWL of 41.9 ± 19.1 before revision).

Conclusions: LRGJ is safe and can lead to further weight loss in patients experiencing weight recidivism post gastric bypass with large gastrojejunostomies. However, long-term follow-up is needed to determine long term durability of this procedure.

A5201

Revisional metabolic surgery after failed primary restrictive procedure

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Introduction: The purpose of this study is to evaluate the outcomes of the revisional metabolic surgery following a failed restrictive bariatric procedure.

Methods: a retrospective study of (81) patients carried to review the indications of revision and outcomes post revision.

Results: Retrospective data were collected from 81 patients underwent revisional metabolic surgery at Mubarak Hospital from Jan. 2009-Jan 2015. Of all patients 44 (54.3%) underwent laparoscopic gastric banding (LGB), (37) patients (45.6%) underwent laparoscopic sleeve gastrectomy (LSG) as a primary procedure. The mean age for the patients = 38.4 (SD ± 9.4) years old, and the mean BMI before the primary procedure = 46 (SD ± 5.8). Patients categorized into two groups; who failed to loose/maintain weight loss (n=73) patients, and the other group who developed undesirable symptoms post primary procedure (n=8), (table1). Group 1 consisted of patients who failed to loose weight (n=73) and underwent different type of revision procedure as shown in (table 2). The laparoscopic gastric banding cases (39 patients) were revised to (LSG), Mini-gastric Bypass (MGB) & (RYGB). On the other hand the laparoscopic sleeve gastrectomy cases (34 patients) were revised to (MGB), resleeve & (RYGB). Group 2 (n=8) patients who had undesirable symptoms post primary procedure. Where (4) out of (5) patients who underwent (LGB) reported persistent GERD symptoms, (2) of them underwent (MGB) & (2) had (RYGB). Only (1) case who underwent (LGB) had mechanical stenosis, which was converted to (RYGB). Total of (n=3) cases underwent (LSG), (1) had gastric outlet obstruction, converted to (RYGB) where other (2) cases converted to (MGB) for persistent GERD symptoms. All patients reported remission of symptoms at 1 year follow-up. Out of 81, (n=21) patients had T2DM pre-revision, with mean HbA1c (10.25 ± 1.7). Out of (21), (12) patients showed improvement during 1 year follow up. (6) Patients showed complete remission (HbA1c ≤ 6%), (4) post laparoscopic gastric bypass & (2) after laparoscopic sleeve gastrectomy. Whereas the other (4) patients showed partial remission with (HbA1c 6% - 6.4) after undergoing (LSG). The last (2) patients showed significant improvement in their (HbA1c) after (LGB) with lowering dose of oral anti-hypoglycaemic agents. Eight Out of (81) patients had hypertension, (5) of those patients had partial remission while (2) patients reported improvement by lowering the dose of anti-hypertension, only (1) patient didn't report any improvement. (4) post laparoscopic gastric bypass & (2) after laparoscopic sleeve gastrectomy. Whereas other (4) patients showed partial remission with (HbA1c 6% - 6.4) after

underwent laparoscopic sleeve gastrectomy. The last (2) patients showed significant improvement with their (HbA1c) readings after laparoscopic gastric banding with lowering the dose of oral antihypoglycemic agents. (8) Out of (81) patients had hypertension, where (5) patients had partial remission while (2) patients reported improvement by lowering the dose of anti-hypertension, only (1) patient didn't report any improvement. All revisional surgeries done laparoscopic, with median length of stay (LOS) =4 days. Mean operation time =141min +/- 90. No mortality encountered. Where main early complications were admissions for optimizing nutritional status. And for late complications shown in (table3).

Conclusion: Failure of weight loss post restrictive bariatric surgery is better treated with malabsorptive procedures such (MGB) & (RYGB). We have shown that (LSG) following (LGB) and re-sleeve following failed (LSG) is less effective than (MGB) and (RYGB) in improving weight loss.

A5202

Tortuous gastric obstruction after laparoscopic adjustable gastric band converted to gastric sleeve.

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Introduction: Laparoscopic adjustable gastric band (LAGB) was a common weight loss surgery for many years, but often results in poor long-term weight loss and complications. Removal of gastric band and conversion to sleeve gastrectomy (SG) is safe as either a 1-step or 2-step operation. We present a 2-step removal of LAGB and conversion to SG that was complicated by a proximal gastric obstruction. The proximal gastric obstruction was not relieved with stenting or balloon dilation, so an operation was performed, revealing an interesting mechanism of obstruction and unforeseen solution.

Case Description: A 43 year-old man with a BMI of 66 presented for bariatric surgery after failing to lose weight with the LAGB. His LAGB was removed without complications and three months later he underwent a SG. On postoperative day two he experienced transient dysphagia that resolved and he was discharged to home. Within a week, he began to experience pain, food intolerance, and reflux that progressed over the next three months to hoarseness and a chronic cough. He had not been able to progress from a clear liquid diet and required

intermittent IV infusions to remain hydrated. Initially the patient was treated with stenting of a proximal gastric obstruction seen on upper GI follow through study (Figure 1), but tolerated this poorly and the stent was removed. An endoscopic balloon dilation was performed and an acute angulation of the gastric sleeve was observed to be causing a functional gastric obstruction, as no mechanical stenosis was observed. Due to severe protein malnutrition, total parenteral nutrition was initiated and he was eventually transitioned to nasojejunal tube feeds. Five months after his SG, he underwent surgery with intent to laparoscopically convert his SG to roux-en-y gastric bypass versus esophagojejunostomy. During the operation, it was observed that the plication from the LAGB was still in place and the angle of His was still intact and had not been taken down from its attachments to the diaphragm. Using on-table endoscopy, the plication and intact angle of His were confirmed to be the cause of the proximal gastric obstruction. After the plication was taken down and the angle of His was dissected free, the proximal obstruction was relieved. A remnant portion of the plication was resected to prevent any further twisting. Upper endoscopy confirmed relief of the proximal gastric obstruction and he did not require conversion of the SG to roux-en-y bypass. He did well postoperatively and was discharged to home on postoperative day 1. His BMI is 47 one year after SG revision, he has had complete resolution of his reflux, and is able to tolerate soft foods.

Discussion: Conversion of failed LAGB to SG is a well-described procedure. When performed in a 2-step fashion, 3 months is the usual interval between LAGB removal and SG. Takedown of the anterior plication is described as an important step in conversion of LAGB to other bariatric surgeries because it restores a more normal gastric anatomy. Additionally, takedown of the angle of His is an important step in establishing the gastric anatomy during SG to ensure appropriate volume of the gastric sleeve. Complications after conversion of LAGB to gastric sleeve are low, but some series describe elevated complication rates compared to primary surgery. This patient's acute angulation of the gastric sleeve causing gastric obstruction is not a complication we have seen described. The solution to this problem was takedown of the plication and takedown of the angle of His, which should have been performed during the original operations. Surgeons caring for patients with feeding intolerance and new reflux after LAGB to SG conversion should

consider this in their differential diagnoses, particularly if they did not perform the original operations, as in this case. The combination of laparoscopic visualization and intraoperative endoscopy was critical to confirm the correct diagnosis of the obstruction, create a solution, and confirm that the obstruction was relieved.

Conclusion: We present this case to demonstrate a pitfall of bariatric surgery after removal of the LAGB. If the plication is not taken down and the angle of His is not dissected free, the full anatomy of the stomach is not delineated during conversion from LAGB to another bariatric procedure, and results may be inconsistent and possibly disastrous. Intraoperative endoscopy can be a useful tool to delineate difficult anatomy and identify potential postoperative complications that will require revision before the operation is concluded.

A5203

Laparoscopic Single Anastomosis jejunogastrostomy ("Sarr Procedure") for Reversal of Roux en Y Gastric Bypass for Refractory Dumping Syndrome: technical aspects and results

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Introduction: Roux-en-Y Gastric Bypass (RYGB) is one of the oldest and most commonly performed bariatric procedures worldwide with excellent short term and long-term outcomes. With the adoption of RYGB widespread as bariatric procedure, one of its rare complications, dumping syndrome and/or hypoglycemia, has been seen more often. Various surgical techniques have been proposed for refractory patients unresponsive to conservative measures, ranging from reversal of gastric bypass, banding of gastric pouch, adjustment of roux limb and/or common channel to more aggressive procedures such as partial pancreatectomy. However, there is no clear data to support one procedure over the other. We present our series of 3 consecutive patients with medically resistant dumping syndrome and postprandial hypoglycemia who underwent a laparoscopic single anastomosis jejunogastrostomy to reverse the malabsorptive component the gastric bypass without compromising the restrictive component (Single Anastomosis Reversal of Gastric Bypass- SARGB), named as 'Sarr Procedure'.

Method: We performed retrospective analysis of prospectively collected data in patients with severe dumping syndrome and/or hypoglycemia after Roux en Y gastric bypass in last 12 months. Demographics and peri-operative outcomes were evaluated.

Results: There were three clinically confirmed cases of severe refractory dumping syndrome and/or hypoglycemia during this time period. All three patients had previous gastric bypass and average interval of time period for the onset of the symptoms since surgery was 9.3years.(SD +-5.5) There were two females and one male with mean BMI of 27 (SD +-3.6). The average age was 55 years (SD +-7.5). All three patients underwent laparoscopic SARGB (Sarr Procedure) with uneventful perioperative and post-operative course and all three patients had LOS of 2 days. After the bypass anatomy is identified, the Roux limb is divided 50-100 cm from gastro-jejunal anastomosis and brought up in ante-gastric fashion to gastric remnant without tension. After adequate dissection of gastric remnant, a side-to-side anastomosis of the distal end of divided roux limb and gastric remnant is performed using linear cutting stapler. At the end of the procedure, patient will still have the gastric pouch thus keeping the restrictive component of the RYGB and active stomach and duodenum, thus decreasing the malabsorptive component and decreasing secretion of incretin (GLP-1 and GIP).All three patients had complete resolution of their symptoms at their follow up visits. No major 30 days complications observed. Laparoscopic Single Anastomosis jejunogastrostomy Reversal of Gastric Bypass (Sarr Procedure) is a safe and a feasible alternative surgical method to treat refractory dumping syndrome and/or hypoglycemia status post Roux en Y gastric bypass. This procedure can be performed laparoscopically in a reasonable OR time and length of stay with no major complications in skilled hands. This is relatively easy technique to reverse the malabsorptive component of the gastric bypass without compromising the restrictive component.

A5204

Laparoscopic Reoperative Bariatric Surgery; a single institution experience.

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Background: Bariatric surgery has been shown to be the most effective in achieving weight loss and improving comorbidities in morbidly obese patients. However, approximately 20 % of patients after Roux-en Y gastric bypass (RYGB) or laparoscopic sleeve gastrectomy (LSG), and up to 50% after laparoscopic adjustable gastric band (LAGB) fail weight loss or do not maintain the initial weight loss in their long term follow-up. In these cases and also in cases of complications, reoperative bariatric surgery (RBS) can be considered. In the present study, we reviewed our RBS experiences and outcomes at Cleveland Clinic Florida.

Methods: Medical charts from 2011 to 2014 were retrospectively reviewed to obtain clinical data of patients who underwent RBS. The data included patient's demographics, BMI, comorbidities, primary bariatric surgery, type of RBS, reasons for the procedure, and operative outcomes. The RBS was defined by following types; conversion, revision, and emergency.

Results: Two hundred twenty eight patients were identified. There were 180 female patients (79%) with average age of 50+-12 and average BMI of 37+-10. The distribution of types of primary bariatric surgeries were 10 (4.4%) VBGs, 105(46%) LAGBs, 93 (41%) -RYGBs, and 20 (8.8%) LSGs. The most common reason for the reoperation for VBG, LAGB, and Gastric bypass was failure of weight loss (50%, 31%, 49% vs 15%, $p<0.01$). The most common reason for LSG was fistula (40%, $p<0.01$), followed by GERD, dysphagia, stricture and obstruction. Over all failure of weight loss was the most common indication for reoperative surgery, Among the different kinds of revisions, the most popular RBS was conversion (n=104, 46%) followed by emergency (n=76, 33%), and revision (n=48, 22%). The significant difference of the %EWL was not observed between the conversion and revision groups after one year; however, a trend of continual weight loss was observed in the conversion group but the opposite phenomenon was detected in the revision group (50.8 (13.9-66.6) % vs 22.0 (10.4 -16.1)%, $p=0.41$)

Conclusion: RBS takes a complex treatment path due to its dependency on the original surgery and the nature and types of the revision. The indication for RBS also has myriad of variations. However, our experience in RBS infers reasonable early outcomes at our institution irrelevant original bariatric surgery. Conversion seems to be most effective RBS procedure in terms of weight loss.

A5205

Surgery is more effective than Medical management for treatment for weight loss failure after bariatric surgery.

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Background: The optimal strategy for the management of patients with weight loss failure and weight regain after bariatric surgery has not been clearly defined. Historically, both medical and surgical treatment strategies have failed to demonstrate durable long-term weight loss or comorbidity improvement. Surgical revision directed toward weight loss and comorbidities (SR) has been associated with high complication rates when compared to primary bariatric procedures. The aim of this study was to compare outcomes of SR to medical management for weight loss failure following bariatric surgery.

Methods: We conducted a retrospective analysis to review all SR procedures performed in our institution between January 2007 and December 2014. Patients undergoing revision with a BMI <30 were excluded. We compared the weight loss and co-morbidity resolution in SR patients to patients undergoing supervised medical management in our 'Back on Track' program (BOT) in a single institution. Patients were eligible to enter the BOT program if they had undergone a bariatric procedure, their BMI was greater than 25; and they were gaining weight. Once entered into the BOT program, patients attend monthly group meetings guided by a GI nutrition physician and dieticians focused on nutrition and physical activity. BOT patients also have a monthly one-on-one meeting with the GI nutrition physician for additional counselling, and evaluation. Subgroup analysis was performed for the SR patients undergoing revision of the gastric pouch (Group A; n=66) and revision of gastric pouch with shortening of the common channel (Group B; n=60). Patients undergoing only shortening of common channel were excluded from analysis due to the small cohort (n= 11). Univariate analysis was used to compare baseline characteristics between the SR and BOT; and Groups A and B using the chi-square test for

categorical variables and the 2 sample t -test for continuous variables. Primary outcomes examined were mean reduction in the BMI after intervention. Secondary outcomes examined were post-operative morbidity, and mortality.

Results: A total of 398 patients with BMI>30 and a prior bariatric procedure were identified. A total of 154 patients in SR and 244 in BOT were evaluated. The groups were similar in age (51 vs 52; $p=0.46$) and gender (83% vs 90% female). The Charlson-Deyo Comorbidity Index prior to intervention was greater in the BOT group (0.3 vs 0.2; $p<0.01$). The BMI prior to the initial bariatric surgery was greater in the SR (54.6 vs 51.0; $p=0.01$). The pre intervention BMI was higher in the SR than BOT groups (43.7 vs 37.7; $p<0.01$); and the SR had significantly greater %Excess BMI Loss at all time intervals. (See Table 1) There were no perioperative mortalities. The 30-day postoperative complication rates (33.3% vs 31.7%; $p=0.84$) and 90-day all cause return to the OR (28.8% vs 25%; $p=0.63$) were not significantly between Groups A or B.

Conclusion: Historically, surgical revision of bariatric procedures specifically for weight loss failure or weight regain have resulted in short term weight loss which has not been durable. This has also been true of medically supervised programs targeting weight loss after bariatric surgery. Our comparison of SR and BOT patients demonstrated significantly greater weight loss for SR patients at all intervals in the first year. When comparing the type of revisional procedure, a combined revision of the gastric pouch with shortening of the common channel (Group B) resulted in superior weight loss compared to revision of the gastric pouch alone (Group A). Surgical revisions were done with no mortalities, but overall complications rates were high and not significantly different for both groups. Revisional bariatric surgery specifically directed toward weight loss is more effective than medical management in short term analysis. However, revisional surgery is associated with a greater complication rates than the primary procedure and longer- term analysis is ongoing.

A5206

Early Experience with Distal Bypass for Weight Regain after Roux-en-Y Gastric Bypass

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Introduction: The aim of this study is to evaluate our one-year outcomes of Distal Bypass (DB) as a revisional procedure for poor weight loss after Roux-en-Y gastric bypass (RYGB).

Methods: All patients who underwent DB, from 2011 to 2015 were identified. Data collected included baseline demographics, co-morbidities, perioperative parameters, length of stay, morbidity and mortality and weight loss at one-year follow-up. Data was summarized as the median and interquartile range (IQR) for continuous variables and as count and frequency for categorical variables.

Results: A total of 17 patients who underwent DB after RYGB were identified. The majority were females ($n=13$, 76%) with a median age of 47 years (IQR 44-51). The median preoperative body mass index (BMI) was 50.7 kg/m² (IQR 43.8-58.2) respectively. Preoperative comorbidities included hypertension ($n=9$, 53%), dyslipidemia ($n=8$, 47%), diabetes mellitus ($n=6$, 35%), sleep apnea ($n=7$, 41%) and fatty liver ($n=2$, 12%). All DB procedures were started laparoscopically, but two required conversions to open. The median operative time was 156 minutes (IQR 138-210). The median time interval after RYGB to DB was of 8.9 years. The median length of common limb and alimentary limb were 150 cm (IQR 75-150) and 150cm (IQR 100-220) respectively. The 30-day complication rate was 17.6% ($n=3$) with major complication in 11.8% (organ space infection requiring intervention, $n=1$ and hemorrhage, $n=1$). There was no 30-day mortality. The excess weight loss at 1 year (47.1% follow up) was 46.1% (IQR 27.7-59.6). Resolution of co-morbidities at 1 year: Hypertension (22%), hyperlipidemia (13%) and diabetes (17%). The complication at 1 year included vitamin D deficiency ($n=2$), iron deficiency ($n=1$), malnutrition ($n=1$), diarrhea with malabsorption ($n=1$). However, there were no readmissions or reoperations in this group.

Conclusion: This early experience with distal bypass suggests that it is an effective and relatively safe revisional procedure after RYGB. Longer follow-up with a larger group of patients is necessary before definitive conclusions can be made.

Keywords: Bariatric surgery, distal bypass, Roux-en-Y, gastric bypass, revision

A5207

Laparoscopic conversion of Roux-en-Y Gastric Bypass to Single Anastomosis Duodenal-Ileostomy with Sleeve (SADI-S): preliminary outcomes

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"Laparoscopic conversion of Roux-en-Y Gastric Bypass to Single Anastomosis Duodenal-Ileostomy with Sleeve (SADI-S): preliminary outcomes
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Introduction: Roux-en-Y gastric bypass (RYGB) was the most common bariatric procedure performed in the United States until 2012, now laparoscopic sleeve gastrectomy (LSG) holds that honor. Weight recidivism is a significant problem after LRYGB. Revision of gastric bypass has traditionally been met with middling results. Various options for revision of RYGB include: conversion to traditional duodenal switch or sleeve gastrectomy, band over bypass, lengthening of the Roux limb, revision of gastro-jejuno-stomy and multiple pouch reduction strategies. This study reports on our early outcomes after laparoscopic reversal of RYGB and conversion to Single Anastomosis Duodeno-Ileostomy with Sleeve (SADI-S).

Methods: Data from patients who underwent laparoscopic reversal of RYGB and conversion to SADI-S between July 2013 and December 2015 was retrospectively reviewed.

Results: Five patients were identified for analysis. The mean age of patients was 39.2. Two patients were male and three were female (M: F=2:3). All patients underwent original gastric bypass for mean BMI of 53.4 kg/m². The indication for revision of their bypass was regain of weight and obesity related co-morbidities in all patients. The mean pre-revision BMI was 41.2. Three patients underwent three anastomoses laparoscopic reversal of bypass and conversion to SADI-S: Gastro-Gastrostomy, Jejuno-Jejunostomy and Duodeno-Ileostomy. The other two patients underwent two anastomoses laparoscopic reversal of bypass and conversion to SADI-S: Roux limb resection followed by Gastro-Gastrostomy and Duodeno-Ileostomy. The procedure was chosen on the basis of length of roux limb (If it was short roux limb, then it was resected).

Gastro-Gastrostomy was performed with linear stapler and Endostitch (mechanical suturing device) closure. Duodeno-Ileostomy was performed in an end-to-side fashion with Endostitch. Each patient had a loop of small bowel with 250cm distal common channel. Preliminary data is available for 1-month and 3-month follow-up for all patients, 7-month follow-up on two patients and 11-month follow-up on one patient. The mean excess weight loss (MEWL) and mean BMI at 1-month was 20.3% and 37.5 kg/m², at 3-months was 36.5% and 34.4 kg/m², at 7-months was 66.2% and 29.3 kg/m² and the one patient at 11-months showed EWL of 61.9% and BMI of 30.2 kg/m². One patient returned to the operating room for suspicion of leak on post-operative day 20; intra-operatively there was an abscess without any discernible active leak. There were no deaths.

Conclusion: Preliminary results seem to indicate the use of conversion of failed RYGB to SADI-S is a safe and effective strategy.

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A5208

Significant liver alterations after bariatric surgery – a case series

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Background: Obesity is closely connected to non-alcoholic fatty liver disease (NAFLD) affecting the vast majority of patients. The most effective therapy for NAFLD is sustained weight loss, therefore bariatric surgery has successfully been utilized to reverse or prevent further progression of NAFLD. However, case reports have shown substantial deterioration of liver function and liver failure after performing radically malabsorptive bariatric operations as the jejunoileal bypass (JIB) and the biliopancreatic diversion (BPD). Clinically evident deterioration of liver function has not been reported in the currently established surgical procedures such as the Roux -en- Y gastric bypass (RYGB), one-anastomosis gastric bypass (OLGB) or sleeve gastrectomy (SG). The aim of our study was to evaluate major liver function impairment after bariatric surgery in patients treated at the Medical University of Vienna, Department of Surgery.

Methods: Consecutive in- and outpatients after bariatric surgery within the preceding two years who presented with severe liver dysfunction were included in this case series.

Results: In total, 7 patients (m:f=1:6; median age 40a, range=30-66a) are reported. Deterioration of liver function occurred after RYGB (n=5), OLGB (n=1 (+1/conversion into OLGB)) and even gastric banding (n=1) after a median postoperative time of 6 months (range=2- 24months). Clinical symptoms varied from fatigue (86%) to ascites (57%), hepatic encephalopathy (29%), and variceal bleeding (14%).

Elevation of transaminases, impairment of coagulation parameters, thrombocytopenia and hypalbuminemia were present in 57%, 86%, 71%, and 100%, respectively. Liver cirrhosis was proven by biopsy in 3 out of 7 patients and a 100% steatosis was present in 1 of the patients. Median % excess weight loss (%EWL) was 113.3% (range=81- 257%). In 5 patients bypass' (BP) length reduction or reversal was performed and led to an improvement of symptoms, determinable also by imaging, histology and blood exam. In one patient liver transplantation was needed, one patient died in septic shock and decompensated liver disease.

Conclusion: To the best of knowledge this is the first description of liver failure/dysfunction after OLGB and gastric banding. Bypass reversal or elongation of the intestinal resorption length led to a rapid improvement of liver dysfunction. However, guidelines for handling bariatric patients suffering from a certain degree of liver pathology are lacking and the long-term outcome is still undetermined. As long as there are only speculations for the patho-mechanism of liver alteration, a meticulous preoperative evaluation including liver status, as well as a regularly scheduled post-operative follow-up for the early identification of liver impairment should be aspired in all patients.

A5209

Management of Gastroesophageal Reflux Disease and Hiatal Hernia Post Sleeve Gastrectomy: Cardiopexy with Ligamentum Teres

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Background: This video demonstrates the management of Gastroesophageal Reflux Disease (GERD) post Laparoscopic Sleeve Gastrectomy (LSG). We present the case of a 26 year old female who underwent LSG 4 years ago. Her pre-operative weight was 116 kgs and her BMI was 44 kg/m². Her post-operative weight was 59 kgs and her BMI was 22kg/m². Post-operatively she had GERD and regurgitation and did not respond to medical treatment and dilatation. Endoscopy, barium swallow and CT scan revealed severe reflux, regurgitation with hiatal hernia. We discussed the treatment options as per our management of GERD protocol with the patient. She agreed to the

ligamentum teres cardiopexy (LTC) technique which is currently being researched. In this video we demonstrate reproducible laparoscopic repair of hiatal hernia and cardiopexy utilizing ligamentum teres in 2 patients suffering from GERD and hiatal hernia. We discussed the option of gastric bypass with the patient as it is the standard of care in treating such complications, however after explaining both procedures the patient opted for LTC with the knowledge that if the procedure fails, she would require subsequently a gastric bypass. The video demonstrates step-by-step the technique of LTC repair which was successful in the short term follow up in both patients as evident in the post operative barium swallow which shows no hiatal hernia or reflux. At 6 months both patients had no symptoms of GERD.

Conclusion: LTC combined with the reduction of the hernia is a good alternative treatment for GERD in patients with previous LSG following our algorithm. The use of intra-operative endoscopy is important in such procedures. Further studies with a longer period of follow-up are needed to address clinical efficacy and safety of the procedure

A5210

Evaluation of Revisional Bariatric Surgery in Patients with Weight Regain

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Background: Obesity is a worldwide increasing health problem. Bariatric surgery has been proven to be the most effective strategy to obtain long term weight loss for patients with morbid obesity. However, not all of the patients achieve the optimum desirable outcomes. Moreover among those who are primarily successful, weight regain is not unlikely specifically in the long run. Revisional bariatric surgery remains as an option for such patients to lose weight again. We evaluated the effectiveness of such procedures in a single institution.

Method: A retrospective review of prospectively maintained database for all patients who underwent revisional bariatric procedures in a single academic institution from January 2013 to December 2015

under IRB approval was performed. Cases with history of inadequate weight loss or weight regain included for further evaluation. Patients' records were reviewed for demographic data, type of revision, body mass index (BMI) and excess body weight (EBW) at the time of initial bariatric surgery. In addition, percentage of excess body weight loss (%EWL) at the time of revision and in sequential follow-ups after revision were evaluated. We excluded patients with less than 3 months of post-revision follow up.

Results: Eighteen patients were included in this study (Female n=16, 88.9 %; White n=12, 66.7%) with the mean age of 49.2 +-8.6 years. The mean BMI at primary bariatric surgery was 52.6 +-12.7. The mean duration between primary surgery and revision was 122 +-27 months (median=102). Before regain weight, all patients had shown history of more than 50% weight reduction before revision except in two cases (%EWL of 37.6 and 42.6). Mean of their best %EWL was from 64.0(+25.4) down to mean BMI of 35.9+-9.4. All cases had weight regain reaching the mean BMI (+SE) of 42.9 (+8.6) at the time of revisional operation. None of the patients had final %EWL of more than 50% at the time of revision except 3 (16.7%). 94.5 % of cases were performed laparoscopic (n=17). Surgical procedures included gastric band removal with either conversion to gastric bypass (n=1, 5.5%) or sleeve gastrectomy (n=3, 16.7%), conversion of sleeve to gastric bypass (n=4, 22.2%; including 1 open surgery), conversion of vertical banded gastroplasty (VBG) to sleeve gastrectomy (n=1, 5.5%), VBG to gastric bypass (n=2, 11.1%). Candy Cane Resection with simultaneous revision of gastro-jejunostomy (n=4, 22.2%) and take down of Gastro-gastrostomy fistula with history of gastric bypass (n=3, 16.7%). The mean operative time was 170(+75) minutes (median=159) and mean post-revisional hospital stay was 3.6(+1) days (median 2 days). Mean follow up after the revisional surgery was 17.2(+3.6) months (median=12 months). 2 patients (11.1%) had more than 4 years follow up after revision. Mean BMI and mean %EWL at 3, 6, 12, 24 and 48 months post-revision was 38.5(+2.1) and 31.9%, 37.8 (+2.8) and 40.2%, 33.2 (+2.1) and 55.4%, 31.6 (+2.6) and 66.2%, 30.2 (+8.5) and 93.3% correspondingly. The percentage of cases who succeeded to collectively lose more than 50% of their primary excess weight after revision was 58.8% (11 out of 17), 75% (9 out of 12), 83% (10 out of 12), 86% (6 out of 7) and 100% (2 out of 2) respectively at 3, 6, 12, 24 and 48 months after revision. No mortality was seen throughout follow up

and complication rate was 11.1% (one pleural effusion and one stricture formation). Patients with comorbidities such as hypertension, diabetes mellitus, obstructive sleep apnea, psychiatric illnesses, GERD, dyslipidemia and osteoarthritis showed comparable results to their counterparts in comparison of weight loss success rates ($p>0.05$) at all of the follow up periods except for patients with history or psychiatric illnesses just at the 3 month post revisional follow up ($p=0.03$). Weight loss success rate although different between two races; however, it was not statistically significant. Comparing cases who underwent laparoscopic adjustable gastric banding (LAGB) at their primary operation (3 cases) who then converted to other procedures later with all the other cases, they had significantly lower primary BMI (41.6 vs 54.7, $p=0.003$), comparable minimum successful BMI (30 vs 36, $p>0.1$) and again significantly lower BMI at the time of revision (35 vs 44, $p=0.007$). More over all the %EWL at the time of revision and all the follow ups did not show statistically significant difference. However, the trend of weight loss among those who had revision from LAGB were more notable.

Conclusion: There is an increasing demand for bariatric surgery and revisional operation in those with weight regain. In our experience, revisional bariatric procedures are safe and effective way to correct weight regain with low complication rates. The psychiatric conditions and related medications should be further evaluated for its effect on short term weight loss success rates.

A5211

Safety and Efficacy Assessment of Revisional Bariatric procedures: A single Institute Experience

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Background: Obesity has increased significantly in the recent decades; more than one third of US, adults are obese. As bariatric surgical procedures are the only most effective treatment modality for obesity, more people are undergoing weight reduction operations. Hence, revisions of these bariatric procedures have also increased, either for complications or un-successful weight loss. We aim

to evaluate the efficacy, feasibility, and safety of revisional bariatric procedures.

Methods: A retrospective review of prospectively maintained database for all patients who underwent revisional bariatric procedures from January 2013 to December 2015 under IRB approval was performed. All procedures were performed by experienced high volume surgeons at a North American academic institution. Patients' records were reviewed for demographic data, symptoms, indication of surgery, pre and post revisional Body Mass Index (BMI), type of revision, and outcomes. Using chi squared test, complication rates, readmission rates were compared with the collective data of all primary bariatric surgical procedures performed in the same institution for the same period of time. We excluded patients with no follow up, band removal without conversion, hiatal hernia or internal hernia repair in patients with prior bariatric surgery.

Results: Seventy-five (75) patients were included in this study (male: female ratio of 11:89 %). The mean age was 50 +- 10 years. The mean BMI before revisional surgery was 36 +- 1.2 and the mean duration of follow up before revision was 106 +- 11 months. Indications for revisional surgery included symptoms like abdominal pain, reflux, dysphagia, weight regain, non-healing ulcer, gastric fistula and anastomotic stricture. The mean operative time was 173 minutes and mean hospital stay was 4 days. Laparoscopic approach was performed in 65 patients and open approach was used in 10 patients. Surgical procedures included gastric band removal and conversion to gastric by-pass in 2 patients (2.7%), conversion to sleeve gastrectomy in 6(8%), 15 patients with conversion of sleeve to gastric bypass (18.7%), 2 patients with conversion of VBG to sleeve gastrectomy (2.6 %), VBG to gastric bypass in 6 patients (8%). 22 patients(29%) underwent Candy Cane Resection(with simultaneous gastric fistula disconnection in 1, pouch revision in 2 and revision of GJ in 12 patients), 10 patients(13%) underwent Pouch Revision(with simultaneous revision of GJ in 4 and gastric fistula disconnection in 3 patients), 4 patients(5.3%) underwent complete reversal of GBP, 4 patients(5.3%) with isolated GJ revision, 2 patients(2.6%) with isolated JJ revision, 1 patient (1.3%) underwent esophago-jejunal anastomosis, reversal of VBG in 1 patient (1.3%). The mean follow up after the revisional surgery was 10 +- 2 months. Symptoms completely resolved in 29 (38.7%), improved in 32(42.7) and did not improve in 4(5.3%) patients. Complications rate was 12% and included wound infection in 1(1.3%), pleural effusion

in 2(2.6%), GI bleeding in 1(1.3%), biloma in 1 (1.3%), intra-abdominal abscess in 1(1.3%), incisional hernia in 1(1.3) and strictures in 2(2.6%) patients. There was no mortality in this period. Comparing the revisional cases and primary bariatric cases, we found no significant difference in leak rates ($p = 0.2$) and readmissions ($p = 0.27$).

Conclusion: Number of revisional surgical procedures is increasing as a result of increasing number of primary bariatric surgical procedures being performed. In our experience, revisional bariatric procedures are safe and feasible with low complication rate, comparable to primary bariatric procedures and have good outcomes. Revisional bariatric procedures should be offered to patients with appropriate indication and should be performed at high volume bariatric centers.

A5212

Endo-Bariatrics: Guidelines, Pitfalls, and Solutions: Outpatient Experience

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Introduction: Morbid obesity and its associated metabolic diseases are on the rise world wide, particularly within the United States. Currently, the best treatment for obesity is bariatric surgery where roux-en-Y gastric bypass is considered the 'golden standard' for substantial weight loss. Although gastric bypass is known for its ability to drastically reduce a patients' excess weight, nearly 20% of patients fail to lose said weight. The common standard to categorize bariatric surgery failure is seen as less than 50% of excess body weight loss or complete regain of weight. Patients who fail gastric bypass, are generally subjected to mutiple medical therapies, diets, and exercise regimens before consideration for surgical intervention. Prior to endoscopic revision, surgeons were required to re-enter the abdomen which carries significant postoperative morbidity and mortality. In order to alleviate this risk from previously operated patients, endoscopic revision was created as an option for patients requiring stomal revisions. The purpose of the following study is to test the longitudinal efficacy of endoscopic revisions of gastric bypass, and document our surgical technical and clinical exprience.

Methods: The following study consists of thirty-six (n=36) bariatric patients (Male=16, Female=20) with ages ranging from 15-58 years of age who received a roux-en-Y gastric bypass requiring stomal revision. All patients enrolled in the following study recieved an EGD indicating an enlarged stoma. Patients with a dialated gastric pouch were excluded from the study do to the external varible preventing weight loss. All patients underwent stomal revision to a reduced size of 5-6mm utlizing the endoscopic suturing device designed by Apollo EndoSurgery by the same surgeon. All patients received weight check and blood workup and general examination pre-operatively and post operatively at 1 week, 1 month, 3 month, 6 months and 1 year. All patients were enrolled in the Bariatric Center of Excellence at Robert Wood Johnson University Hospital and subject to all requirements including nutrition, exercise, and support group regimens. Patients were accessed for excess weight loss, resolution of comorbidities, complications, vitamin deficiencies, and general quality of life.

Results: Male/Female Excess Weight Loss
75% 64% Resolution of T2DM 83%
68% Resolution of Hyperlipidimia 100%
100% Resolution of Joint Pain 95%
100% Complication Rate 0%
0% Average Operative Time (min) 15.5min
16.4min Average Hospital Stay (Hr) 22.3hr
22.9hr Vitamin Deficiency 15%
34% Quality of Life Increase 63% 59%
After Surgery(1-10 before/1-10 after)

Conclusion: As seen, endoscopic revision of enlarged stoma is a viable non-operative revisional procedure which allows for ample weight-loss and resolution of comorbidites. Surgery for failed bariatric patients has particular risks and benefits that must be accounted for when considering an invasive re-operative approach due to their unique physiological, psychological and emotional needs. As such, reasonable guidelines are necessary to ensure successful/safe weight loss in reoperative bariatric patients.

A5213

Remnant gastrectomy and weight loss: added benefit or increased risk?

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Introduction:Remnant gastrectomy (RG) appears to be a safe and effective surgical procedure. However, its efficacy in long term weight loss remains largely unknown.

Methods:Medical records from 2011-2014 were reviewed for demographics, operative and post-operative outcomes. Our patients were followed up for 30 days, 3 months, 6 months and yearly after discharge.

Results: A total of 228 cases were identified (41 cases with RG vs. 187 cases without RG). Comparing all procedures with and without RG, there were no demographic differences (50.6 +- 12.4 years vs. 50.5 +- 12.2 years; $p = 0.95$, 36.1 +- 11.8 kg/m² vs. 37.4 +- 9.1 kg/m²; $p = 0.53$). Fistula and ulcer formation were the predominant reasons for revision (34.1% (14) vs 4.9% (9); $p < 0.001$; 9.8% (4) vs. 2.2% (4); $p = 0.02$). Procedures with RG were associated with more operative time, blood loss, and longer hospital stay. There was no difference in BMI loss between RG cases and cases without RG on follow-up. On sub-analysis, a comparison of each procedure that included a RG or not to the same type procedure without a RG (i.e. Vertical Band Gastrectomy (VBG), laparoscopic adjustable gastric banding (LAGB), laparoscopic roux-en-y gastric bypass (LRYGB), or Laparoscopic sleeve gastrectomy (LSG)). We analyzed demographics, reasons for revisions, and post-operative outcomes for each procedure. For LSG (10 vs. 103 cases), reasons for revisions were not significant except for fistula in LSG (80% vs. 26.7%, $p = 0.04$). Also, only baseline and 12 months BMI follow showed statistical and marginal significance (31.7 +- 1.6 vs. 38.1 +- 7.4, $p = 0.04$; 32.6 +- 0.8 vs. 34.9 +- 5.8, $p = 0.05$). For LRYGB (24 vs. 69 cases), only fistula and weight regain as a reason for revision and operative time was significant (41.7% vs. 4.4%, $p < 0.001$, 29.2% vs. 57.4%, $p = 0.02$, 142.3 +- 53.2 vs. 105.0 +- 42.9, $p = 0.002$), while GERD and blood loss were marginally significant (12.5% vs. 2.9%, $p = 0.07$, 225.0 +- 294.6 vs. 100.9 +- 20.6, $p = 0.05$).

Conclusion: RG is a safe procedure but may require more hospital costs without benefits regarding weight loss.

A5214

Laparoscopic revisional bariatric surgery in the geriatric population: a single institution experience.

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Introduction/Background: Bariatric surgery has proven to be the most effective and durable method of treating obesity and its comorbidities. The number of bariatric surgery is steadily on the rise. Although data on revisional bariatric surgery exist, there is almost no data analyzing elderly population who requires re-operation after previous bariatric procedure. In the present study, we reviewed specifically the outcomes of the elderly population who underwent reoperative bariatric surgery (RBS). **Method:** Medical charts of patient who underwent RBS from 2011 to 2014 were retrospectively reviewed. The elderly group was defined as patients who were older than age 60 at the time of the revisional procedure. The data included patient's demographics, BMI, comorbidities, primary bariatric surgery, type of RBS, reasons for the procedure, and operative outcomes. We included all primary bariatric surgeries: laparoscopic gastric bypass (LRYGB) and laparoscopic adjustable gastric band (LAGB), vertical banded gastroplasties (VBG) and laparoscopic sleeve gastrectomies (LSG). **Results:** Two hundred twenty eight total patients underwent revisional bariatric surgery. Fifty sixty patients were older than 60 years of age, and 172 patients were younger than 60 years of age. Average age of the older patients was 66.5 +-4.4 and the average age of the younger patients was 45.4 +-9.0. Female gender was more predominant in both the older and younger group at 76.8% and 79.7% ($p=0.65$). Average BMI of both groups were similar as well: the older group's BMI was 35+-8.61 and the younger's BMI was 37.8+-9.9 ($p=0.08$). Elderly patients were found to higher prevalence of HTN in comparison to younger patients ($p=0.02$). There was no statistical difference in prevalence of other comorbidities between the two age groups including diabetes mellitus (DM), hyperlipidemia, gastroesophageal reflux disease (GERD), and sleep apnea. When the elderly and younger patients were compared based on their primary operations, we found no statistical difference in all measured demographics and co-morbidities for the primary LAGB patients (18 elderly, 87 younger), LRYGB (26 vs. 67), VBG (7 vs. 3), and LSG (5 vs. 15); The operative outcomes including average OR time o, estimated blood , length of stay (LOS) , complication rate and

readmission rates were similar between the groups. This information is presented in table 1. In the sub analysis, the percentage of excessive BMI loss (%EBMIL) was evaluated based on the different primary operation. At the 3 month, 6 month, and the 12 month follow up, there was no difference in %EBMIL between the elderly and younger groups in the LGB arm. Same pattern of %EBMIL was observed in all other groups.

Conclusion: In our study, elderly patients are shown to have more co-morbidities than the younger patients at baseline. However, revisional bariatric surgery in geriatric patients appears to be safe. Also, revision surgery yields effective weight loss postoperatively, and it can be a potential solution of weight loss for patients who experience post bariatric surgery weight gain or failure of adequate weight loss.

A5215

FAILED ADJUSTABLE GASTRIC BANDING CONVERTED TO LAPAROSCOPIC GASTRIC BYPASS. A COMPARISON TO PRIMARY BYPASS Nahum Beglaibter, Abbas Al-Kurd, Muhamad Ghanem, Ronit Grinbaum Minimally Invasive Surgery division, Department of Surgery Hadassah Mount Scopus University Hospital, Jerusalem, Israel
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Aims: Laparoscopic Adjustable Gastric Banding (LAGB) has a failure rate as high as 40-50% and the incidence of revisions is 20-40%. Laparoscopic Roux en Y Gastric Bypass (LRYGB) is one of the rescue options. The aim of this study is to compare immediate and long term complication rate, weight loss and resolution of comorbidities between LAGB converted to LRYGB and primary LRYGB.

Methods: Retrospective analysis of prospectively collected data of all the patients converted from LAGB to LRYGB between the years 2007 and 2015. This group was compared to a cohort of patients, matched for age and gender who underwent primary LRYGB during the same period. Primary outcomes included early and late complications. Secondary outcomes included weight loss and resolution of comorbidities.

Results: 131 patients underwent conversion from LAGB to LRYGB. These patients were compared to 131 primary LRYGB. Mean age (41.7Y), male to female ratio (1:2) and ASA score(2.4) were identical. Reasons for conversion were: weight regain - 74.2%, food intolerance - 34%, slippage - 13.8% and

GERD in 12.1%. Mean preoperative BMI for the conversion group was 45.6 and for the primary LRYGB was 44.9. There was a higher prevalence of comorbidities in the primary bypass group (76.4% vs 55.3%). 76.7% of the patients underwent band removal and LRYGB in the same operation. Mean operative time was 126.3 min for the primary LRYGB and 149.7 min for the conversion group. Early overall complication rate in the conversions and the primary group were 6.8% and 10.7% respectively. Late complications were 18.9% and 25.5% respectively. After a mean follow-up of 25 months excess weight loss was 60.3% and 78.5% for the conversion and the primary groups respectively.

Resolution/improvement in Diabetes was 90.5% for the conversions vs 75.9% for the primary group. Hypertension resolution/improvement was 35% for the conversion group and 57.4% for the primary LRYGB. Dyslipidemia improvement/resolution was 43.5% for the conversion group vs 75.9% for the primary LRYGBs.

Conclusion: Conversion of LAGB to LRYGB even as a one step procedure is safe without any additional risk for early or late complications when compared to primary RYGB. The weight loss tends to be less but the resolution/improvement of comorbidities is excellent. <u>Disclaimer for the scientific comitee:</u> Part of the data in this abstract will be presented in the coming EAES meeting June 16 in Amsterdam.

A5217

One-year results of revision and conversion bariatric procedures

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Background: All bariatric operations have an incidence of suboptimal weight loss or weight regain. A study by Nelson DW *et al.* demonstrated that nearly 20% of 77,406 gastric bypass patients had failed to lose at least 50% of their excess weight by 1 and 2 years postoperation. Revising the gastrojejunostomy (GJ) and gastric pouch in gastric bypass operations can be performed surgically or endoscopically. Weight regain after the adjustable gastric band (LAGB) is common and often these patients are converted to either vertical sleeve gastrectomy or gastric bypass. Aarts EO *et al* demonstrated 201 patients underwent an LAGB for morbid obesity with a mean 14-year follow-up and 99% of patients with complete follow-up. Mean BMI

was 45.6. Mean EWL in this study was also disappointing at 48%, 39% and 37% after 5, 10, and 14 years respectively. The aim of this study is to determine the feasibility and short-term outcomes of conversion and revision bariatric surgery. Weight recidivism can be classified into weight regain (gain of 20% of maximum weight lost){N=33} or inadequate weight loss (defined as %EWL < 50%) {N=9}.

Method: This is a retrospective study of 42 patients. Patients underwent conversion of gastric banding to gastric bypass (N=12) and sleeve gastrectomy (N=4) as a one-stage procedure, and revisions were offered to 26 patients that had prior gastric bypass. Revisions were of the GJ (N=15) and endoscopic stoma and pouch reduction (N=10) and revised common channel (N=1). All patients underwent preoperative preparation with multi-disciplinary counseling into etiology of failure, upper endoscopy and contrast imaging.

Result: Between July 2012 to July 2015, 42 consecutive patients (Female = 35, mean body mass index: BMI = 45.04 kg/m², and mean age = 46.38) had a conversion and revision from a primary bariatric surgery. Time between primary bariatric surgery and revision or conversion was 8.62±3.52 {Range: 1-14 years}. Mean intraoperative blood loss was 35.10 ml with no intraoperative complications. Five (5/42:11.9%) major post-op complications occurred early and included one omental bleeding and two LUQ wound infection post Lap revised GJ and partial gastrectomy, one Pseudo Peterson hernia and one small bowel obstruction post conversion band to bypass. Mean follow up was 15.5 months with mean EWL of 30.4 %. Mean %EBWL was 21.5 % for revision of the GJ and pouch, 26.4% EBWL for Apollo suturing, 47.29% EBWL% for Band to Bypass, and 22 % EBWL for band to VSG. We found the better outcome in conversion group if the patient returned to have the conversion surgery before 6 years after primary bariatric surgery: 42.50% EBWL% (< 6years group) vs 39.78% EBWL%(> 6 years group) but not statistically significantly, p = 0.76

Conclusion: The conversion from gastric banding to gastric bypass or sleeve gastrectomy can safely be performed in one stage while offering significant weight loss. Revising the anatomy of an abnormal gastric bypass is technically feasible and can safely be performed in select patients. However, weight loss may be modest and timing of the second intervention from index operation may impact subsequent weight loss. Outcome data (Mean±SD) First visit BMI (kg/m²±SD) 45.04±8.59 Excess

weight loss (%±SD) 30.39±15.81 TBWL (kg±SD) 20.59±13.84

Results of conversion group:

Group	Mean time between both surgery (years)	Mean EWL last (%)	Mean %EBWL (%)	Mean TBWL (kg)	Mean BMI Last FU (kg/m ²)
Band to bypass (N=12)	6.38±2.918 (2-11)	42.50±21.94	21.5	13.64	36.79
Band to sleeve (N=4)	6.38±2.918 (2-11)	39.78±13.60	26.4	13.64	36.79
Conversion band to sleeve (N=15)	6.38±2.918 (2-11)	39.78±13.60	26.4	13.64	36.79
Conversion band to gastric bypass (N=10)	6.38±2.918 (2-11)	39.78±13.60	26.4	13.64	36.79
Conversion band to bypass (N=1)	6.38±2.918 (2-11)	39.78±13.60	26.4	13.64	36.79

Mean time between both surgery was 6.38±2.918 (2-11) years

Mean EWL last: 42.50±21.94 (< 6 years, N=7) vs 39.78±13.60 (>= 6 years, N=9), P value = 0.76

Mean %EBWL: 21.5 (< 6 years, N=7) vs 26.4 (>= 6 years, N=9), P value = 0.76

Mean TBWL (kg): 13.64 (< 6 years, N=7) vs 13.64 (>= 6 years, N=9), P value = 0.76

Mean BMI Last FU (kg/m²): 36.79 (< 6 years, N=7) vs 36.79 (>= 6 years, N=9), P value = 0.76

LOS (days): 3.46 (1-21) vs 2.5 (2-3), P value = 0.55

FU (Month): 10.4 vs 7, P value = 0.19

EWL %: 21.99% vs 21.5%, P value = 0.91

TBWL (Kg): 13.64 vs 13.64, P value = 0.91

BMI Last FU: 36.79 vs 36.79, P value = 0.91

BMI = Body Mass Index, LOS = Length Of Stay, FU = Follow Up, EWL = Excess Weight Loss, TBWL = Total Body Weight Loss

A5218

PCORnet Bariatric Study: Patient-Centered and Policy- Relevant Research on Bariatric Outcomes
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Background: Bariatric surgery as a treatment for severe obesity has increased dramatically over the past two decades, but there have been few high-quality, long-term studies comparing the outcomes of different procedures. Prior studies have not been sufficiently large to examine differences in outcomes across important patient subgroups, including older adults (>=65 years of age) and racial/ethnic minorities. Bariatric surgery outcomes research is limited and consists of studies with limited follow-up duration. More studies are needed in larger, broadly representative samples to help inform patient and provider decisions about the optimal choice of bariatric surgical procedure in various populations.

Methods: The study's main goal is to provide accurate estimates of the one-, three-, and five-year benefits and risks of the three most common bariatric procedures in the United States today-Roux-en-y gastric bypass, adjustable gastric banding, and sleeve gastrectomy-with a focus on outcomes that are important to adults and adolescents with severe obesity: 1) changes in weight, 2) rates of remission and relapse of diabetes, and 3) risk of major adverse events. The study has two additional goals: 1) the identification of patient preferences and opinions about (a) whether to undergo bariatric surgery; (b) which bariatric procedure to utilize; and (c) the delivery of follow-up care after bariatric surgery to be studied through a series of focus groups involving adults and children with severe obesity, and 2) the development of infrastructure-in the form of study processes and procedures-to support future comparative effectiveness studies using the National Patient-Centered Clinical Research Network (PCORnet). The study will demonstrate the PCORnet distributed research network's capacity to efficiently use electronic health records data from across the country to answer clinically-relevant questions. Patients and other stakeholders have been engaged in the development of the research questions, the selection of outcomes and the design of the study

protocol, and will be engaged in all stages of the research moving forward, including protocol development, monitoring study conduct, and designing and implementing dissemination plans.

Results: This study involves 11 of PCORnet's Clinical Data Research Networks (CDRNs) including 56 healthcare organizations across the United States and more than 60,000 patients who have previously undergone bariatric surgery from 2005-2015, with approximately 50 percent gastric bypass, 10 percent gastric banding, and 40 percent sleeve gastrectomy procedures. There is also large geographic variation in the bariatric procedures performed, with some areas dominated by gastric bypass while others are dominated by sleeve gastrectomy. This study includes more than 900 adolescent bariatric patients (the largest adolescent cohort ever) and more than 17,000 adult patients with diabetes. The study will take place in 2016-2017, with final results of all study aims anticipated by January 2018.

Conclusions: This study is particularly timely because the sleeve gastrectomy procedure has rapidly grown in popularity in the United States (introduced in the late 2000s as a stand-alone procedure, it currently represents more than 50 percent of all procedures in our 11 PCORnet CDRNs), yet it lacks long-term data comparing its outcomes to the more well-established procedures. Apart from its size and geographic diversity, another key feature of the study is the depth and diversity of its stakeholder involvement, which includes several patients as study team members and executive stakeholder advisors, multiple pediatric and adult bariatric surgeons from different institutions, primary care and specialty physicians, researchers, and leaders of patient-level policy and advocacy organizations. This robust engagement strategy will help insure that the products of this research study are meaningful to patients, clinicians, and policy makers - and will help facilitate the rapid translation of our findings into clinical practice.

A5219

Histopathological Assessment of Staple Line Reinforcement Materials in a Porcine Model

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Background: The objective of this study was to evaluate and compare two staple line reinforcement materials in a porcine model.

Methods: Ten pigs underwent laparoscopic surgery with two different reinforcement materials, GORE SEAMGUARD Bioabsorbable Staple Line Reinforcement (BSG) or Synovis Peri-Strips Dry with Veritas Reinforcement (PS). Each animal had two wedge resections created along the greater curvature of the stomach using one of the two reinforcements, with only one material present at each site. At each of the three designated time points (10 +/- 1 day, 43 +/- 3 days, and 180 +/- 5 days), three animals were euthanized with the exception of the 10 day time point which included only two animals, macroscopic observations were recorded and the implant sites were evaluated for histological assessment of tissue response.

Results: Macroscopic observations determined that there was no evidence of leaks or bleeding related to either staple line reinforcement materials at any time point. Histopathology was done and revealed some marked differences, most notably in the inflammatory response, between the two devices. At 10 days, the BSG devices had mild to moderate inflammation mostly at the device interface with minimal fibrous tissue ingrowth and some evidence of bioabsorption. Whereas the PS devices had extensive inflammation at the device interface with minimal cellular and tissue infiltration and some evidence of bioabsorption. At 43 days, the inflammatory response was persistent and continued to differ between the two devices; there was evidence of bioabsorption for both devices, while the BSG device alone had noticeable fibrous tissue ingrowth. At 176/177 days, the inflammatory response had diminished with both devices and was similar.

Conclusion: There were early differences in the tissue response and increased inflammation seen with the PS at Days 10 and 43. At 6 months there was little difference in the tissue present in the original implant location between the two devices.

A5220

Rhodiola crenulata decreases HMGB1 expression in hepatocytes resulting in attenuated inflammatory response by the liver

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Background: Non-alcoholic fatty liver disease (NAFLD) is the most common liver disorder in developed countries. Increasing lipid deposits in the liver leads to a chronic inflammatory state which is associated with decreased insulin sensitivity and metabolic syndrome. *Rhodiola crenulata* (RC) is a Tibetan mountain plant which has been shown to ameliorate glucose derangements and improve liver function. Isolated phytochemicals derived from *Rhodiola sp* have been reported to suppress inflammation in a number of inflammatory diseases. However, these phytochemicals have been shown to work synergistically when delivered as the whole compound. The mechanism by which RC exerts its effects remains unclear. High mobility group box-1 (HMGB1) promotes inflammation through signal transduction of cytokines IL-6 and TNF- α ; and by chemotaxis of innate immune cells. This signaling response is intrinsic to the development of obesity-induced inflammation, insulin resistance, and NAFLD. TNF- α ; is the primary activator of macrophages in steatotic livers. Neutrophil infiltration is an established aspect of the inflammatory response in NAFLD and liver injury, and has a causative role in insulin resistance via enzyme neutrophil elastase (Ela). Nuclear factor- κ B (NF- κ B), which serves as a signaling molecule to other inflammatory genes, is a critical regulator of the HMGB1-induced inflammatory pathway. Objective Our aim was to elucidate the mechanism through which RC protects the liver from inflammation-induced damage and hepatocytes from insulin resistance in the context of diet-induced obesity.

Methods: The effects of RC on hepatocytes were investigated *in vitro* and *in vivo*. Human hepatocyte cells (HepG2) were treated with either a 100 ug/ml hydroalcoholic RC extract or equivalent volume of vehicle control (10% ethanol), then exposed to lipopolysaccharide (LPS) to induce an inflammatory response. Immunocytochemistry was performed using an antibody to HMGB1. HMGB1 protein expression was further measured by western blot and NF- κ B activity was evaluated by The Cignal NF- κ B reporter system. Female 129/C57Blk6 mice (n=40) were placed on either a normal diet or on a high fat diet (HFD) starting at ten weeks of age for twelve weeks. RC or the equivalent volume of vehicle control was supplemented in the water. Fasting blood glucose levels were measured from the tail vein by glucometer and monitored

continuously for two hours after insulin injection. The mice were sacrificed and total body and liver weights were recorded. Immunohistochemical analysis was performed on paraffin-embedded tissues using antibodies for monoclonal neutrophil marker (NIMP-R14) and polyclonal anti-HMGB1. Frozen sections were stained with hematoxylin and eosin and evaluated for lipid deposition. Total RNA was extracted from the gonadal fat pads and livers of mice in each treatment group, as well as from each group of HepG2 cells, and evaluated for cytokine and immune cell marker expression by quantitative real-time polymerase chain reaction (qRTPCR).

Results: RC-treated HepG2 cells demonstrated decreased HMGB1 protein expression compared to ethanol-treated cells when exposed to LPS on western blot and immunocytochemistry. Immunohistochemistry of LPS-exposed cells demonstrated a dose-dependent decrease in HMGB1 when cells were pretreated with RC compared to ethanol control. Reporter assay confirmed LPS-induced NF- κ B activity in the HepG2 cells ($p < 0.0094$) and demonstrated that pretreatment with RC reduced LPS-induced NF- κ B activity ($p < 0.0462$). Analogous trend was seen on qRTPCR analysis of IL-6 and TNF- α ; mRNA expression. Mice fed a HFD and supplemented with RC had significantly decreased HMGB1 expression on immunohistochemistry compared to ethanol-treated controls, similar to mice on a normal diet. After twelve weeks on a HFD, insulin tolerance tests confirm that RC protects against insulin resistance in mice ($p < 0.0001$) without altering percent body fat, liver weight, or hepatic lipid deposition, as shown by Oil-red-O staining. Significant decreases in the expression of TNF- α ; IL-6, and CD68 mRNA were seen in RC-treated mice compared to ethanol-treated mice ($p < 0.05$, $p < 0.05$, and $p < 0.01$, respectively), suggesting a reduction in macrophage infiltration associated with steatosis. Gene transcript levels of neutrophil chemoattractants, Kc and Mip-2, as well as neutrophil markers Ly6G, Cd11b, and the enzyme neutrophil elastase (Elane) were also significantly decreased in RC-treated animals ($p < 0.05$, $p < 0.05$, ($p < 0.0001$, $p < 0.05$, $p < 0.0001$, respectively), suggesting decreased neutrophil infiltration. IHC analysis using an anti-Ly6g antibody, confirmed decreased neutrophil chemotaxis to the liver in RC-treated mice.

Conclusions: Treatment with RC interferes with a critical signaling loop involving HMGB1 in obesity-

induced hepatic inflammation via reduction in NF- κ B signaling and IL-6 and TNF- α ; expression. Neutrophil and macrophage signaling and infiltration are decreased in RC-treated hepatocytes. Furthermore, supplementation of RC demonstrated a protective effect against insulin resistance *in vivo*. These results support the use of RC as an adjunct to protect the liver from some of the most deleterious metabolic effects of obesity.

A5221

A Comprehensive Stakeholder Engagement Plan for the Patient Centered Outcomes Research Network (PCORnet) Bariatric Study

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Background: The Patient Centered Outcomes Research Network (PCORnet) Bariatric Study is a nationwide collaborative of over 50 clinical systems and academic medical centers. At PCORnet sites, over 60,000 patients (more than 900 of whom are adolescents) have undergone bariatric surgery between 2004 and 2014. The PCORnet Bariatric Study will examine the weight, diabetes, and adverse event outcomes in these patients. An integral part of this study is an extensive stakeholder engagement plan that was developed to include the voices of a number of representative groups who have direct interests in bariatric surgery outcomes research. This presentation is designed to outline the rationale for the PCORnet Bariatric Study's engagement strategy and to provide tools, methods, and lessons learned for engaging bariatric surgery stakeholders.

Methods: There are three overarching goals for the PCORnet Bariatric Study engagement plan: 1) to provide an equal voice for stakeholder groups representing patients and their families, providers and surgeons, community and advocacy

organizations, research investigators at the local clinical networks contributing data to the study, and healthcare policy and insurance coverage decision makers, in the study design, implementation, and dissemination; 2) to create, test, and promote access to a national network of bariatric patient and family engagement platforms where patients and their families are free to exchange information and share experiences, learn about bariatric surgery, and communicate with providers, policy makers, advocacy groups, and research scientists in a neutral commercial-free environment; and 3) to understand how payer and insurance groups make decisions about coverage for bariatric surgery and design and implement the study such that it provides the evidence necessary for them to make informed coverage decisions. Central to the achievement of these goals is the Executive Bariatric Stakeholder Advisory Group which is made up of patients who have had bariatric surgery, bariatric surgeons, bariatricians, community advocates, and research scientists.

Results: Toolkits customized for the engagement of patients and families as well as surgeons and providers will be presented. They will include: methods for initially identifying and onboarding each stakeholder, communication tools for the preparation of complex study methods and analytic strategies for lay audiences, focus group and structured interview scripts specific to patients eligible for surgery as well as those who have had surgery, strategies for gathering information from bariatric stakeholders, tips for how to build this information into the interpretation of study findings, and a dissemination guide that will assist researchers in preparing materials for disseminating study findings to a variety of audiences interested in bariatric surgery including community, advocacy, and healthcare policy and insurance coverage decision makers.

Conclusions: With this comprehensive stakeholder engagement strategy we hope to provide a rapid translation of the relevant findings from the PCORnet Bariatric Study into real-world clinical practice. Our engagement strategy will provide the methods and tools to do this so that a variety of stakeholder groups can understand and use our findings in their day-to-day lives and professional work.

A5222

Lorcaserin Halts Weight Regain after Bariatric Surgery – A Pilot Study

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Background: Obesity is a chronic disease that is a significant healthcare concern. Bariatric surgery remains the most effective treatment of morbid obesity, and is often part of a multi-modality treatment approach that includes dietary modification, pharmacotherapy, and physical activity. Lorcaserin (Arena pharmaceuticals) is an FDA-approved selective 5-HT_{2c} receptor agonist that promotes satiety, and its use in obesity management is being explored. In this study, we examined the use of Lorcaserin to halt weight regain after the initial weight loss following bariatric surgery.

Methods: This pilot study is a review of a prospective database of patients who underwent bariatric surgery at a single Veterans Affairs medical center. After initial postoperative weight loss, patients who experienced weight regain >12 months after bariatric surgery were eligible for treatment with Lorcaserin (10 mg twice a day) for 3 months. Patients were followed at regular intervals by an inter-disciplinary team and data retrieved from the electronic medical record. Contraindications to Lorcaserin treatment included pregnancy and concurrent use of other serotonergic agents.

Results: Of 299 patients who had bariatric surgery at the Palo Alto VA, we identified 7 patients with no contraindication to taking Lorcaserin and who had persistent weight regain >12 months after undergoing bariatric surgery. The majority of the patients were male (86%) with a mean pre-operative body mass index (BMI) of 45.2 kg/m². Following bariatric surgery there was an average maximum BMI loss of 10.2 kg/m² (6.8-13.3 kg/m²) before Lorcaserin treatment. The average BMI re-gain prior to initiation of Lorcaserin was +3 kg/m². Mean time from bariatric surgery to initiation of Lorcaserin was 39.9 months (14-61 months). Lorcaserin therapy prevented additional weight regain in 6 of 7 patients (86%), with an average BMI loss of 1.1 kg/m² (-0.3 to 3.6 kg/m²) (figure 1). One patient did not tolerate Lorcaserin due to myalgia and nausea.

Conclusion: A three-month treatment with Lorcaserin is effective in stopping weight regain following bariatric surgery. Long-term studies are needed to determine the durability of this effect and the best timing for initiation of therapy.

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Body mass index and the efficacy and safety of the needle-free fentanyl iontophoretic transdermal system in postoperative pain management: Results of a pooled analysis of six phase 3 and 3B trials

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Background: Postop pain management can be challenging in patients with a high body mass index (BMI) especially related to poor venous access and difficulty in ambulation. Intravenous (IV) patient-controlled analgesia (PCA) has limitations. Fentanyl iontophoretic transdermal system (fentanyl ITS) is a needle-free and line-free analgesic used in acute postop pain and may provide advantages in patients with high BMI.

Methods: Data from 3 registration, placebo-controlled trials and 3 active-comparator trials using fentanyl ITS in the management of postop pain were analyzed using BMI categories of < 35 kg/m², 35 to 40 kg/m² and > 40 kg/m². The majority of patients had upper and lower abdominal or orthopedic surgery. The primary efficacy variables were assessed via the patient global assessment of pain control (PGA) at 24 hours and the investigator global assessment of pain control (IGA) at study discharge. The PGA and IGA were also assessed throughout the study. PGA and IGA are categorical 4-point scales (excellent, good, fair, or poor) with treatment 'success' defined as either excellent or good. Safety was evaluated via treatment-emergent adverse events (TEAEs).

Results: There were 1403 patients randomly assigned and treated with fentanyl ITS (1180 with a BMI of < 35 kg/m²; 136 with a 35 to 40 kg/m²; 85 with a BMI > 40 kg/m² and 2 missing). The magnitude of 'success' on the PGA at 24 hours was consistent across the BMI groups in patients treated with fentanyl ITS (<35 kg/m²: 946/1180 [80.2%]; 35 to 40 kg/m²: 103/136 [75.7%]; and > 40 kg/m²: 65/85 [76.5%]). The IGA results at study discharge were similar to the PGA. Efficacy was similar with fentanyl ITS and morphine IV PCA in the active-comparator trials. The most frequently reported TEAEs were nausea, pyrexia, vomiting and headache. There were no safety differences seen between the BMI groups.

Conclusions: In these analyses, fentanyl ITS was as efficacious in patients > 40 kg/m² as it was for those <35 kg/m² or 35 to 40 kg/m². Overall, fentanyl ITS was as well tolerated across all BMI categories.

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Accumulation of CD11c+CD163+ adipose tissue macrophages through up-regulation of intracellular 11 β -HSD1 in obese individuals

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Adipose tissue macrophages (ATMs) are key players for regulation of adipose tissue homeostasis and obesity-related metabolic disorders. However, the phenotypes of human ATMs and regulatory mechanisms of their polarization have not been clearly described. Here we studied human ATMs in both abdominal visceral and subcutaneous adipose tissues (VAT and SAT), and identified 11 β -hydroxysteroid dehydrogenase type 1 (11 β -HSD1)-glucocorticoid receptor (GR) regulatory axis that dictates the M1/M2 polarization in ATMs. The accumulation of CD11c+CD163+ ATMs in both VAT and SAT obese individuals was confirmed at cellular and gene expression levels, and this clearly correlated with body mass index (BMI) and production of reactive oxygen species (ROS). Using our in vitro system where human peripheral blood monocytes (hPBMs) were co-cultured with SGBS adipocytes, the M1/M2 polarization was dependent on 11 β -HSD1, an intracellular glucocorticoid reactivating enzyme. The exposure of hPBMs to cortisol induced expression of CD163, and a GR antagonist RU-486 significantly abrogated up-regulation of CD163 by co-culturing with mature adipocytes in hPBMs. Moreover, 11 β -HSD1 was expressed in crown ATMs in obese adipose tissue (AT). Of importance, conditioned medium from co-culture of adipocytes with hPBMs enhanced proliferation of human breast cancer MCF7 cells and MDA-MB-231 cells. In summary, phenotypic switch of ATMs from M2 to mixed M1/M2 phenotype occurred through differentiation of adipocytes in

obese individuals, and 11b-HSD1-GR regulatory axis is pivotal in the process.

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The Impact of Cardiopulmonary Metabolic Exercise Test and Resting Echocardiogram Results Upon Bariatric Surgery Outcomes

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Background: Obesity is a major and modifiable risk factor for heart disease. Bariatric surgery is known to be a safe, effective and enduring treatment for obesity. A hallmark of both safety and effectiveness in bariatric surgery is preoperative risk assessment and correlation of testing results to weight loss. Both exercise capacity and cardiac assessment can be difficult or slow to obtain in a bariatric surgery clinic due to lack of either equipment and/or qualified specialists. A potential solution to the lack of timely access to needed cardio-metabolic testing is to have studies performed in a bariatric surgery clinic and then confirmed by specialists. This study examines the prevalence, improvement and correlation of weight loss to Cardiopulmonary Metabolic Exercise Test (CMET) and Resting Echocardiogram results performed in bariatric surgery clinics with results confirmed by specialists.

Methods: 112 patients who underwent bariatric surgery and had preoperative Cardiopulmonary Metabolic Exercise Tests (CMET) and Resting Echocardiograms performed were included in this study. In addition, a subset of patients had repeat testing performed postoperatively. All tests were obtained in bariatric surgery clinics with ambulatory equipment and read by qualified specialists. From >100 variables, the following selected variables are reported: (HR) resting Heart Rate, (SysBP) Systolic Blood Pressure, (Dia BP) Diastolic Blood Pressure, (RR) Respiratory Rate, (Max VO₂, mL/kg/min) maximal oxygen consumption, (VO₂ Max VCO₂ (L/min) maximal carbon dioxide produced and exhaled at peak in liters per minute, (VO₂ Max RER) Respiratory Exchange Ratio, ratio between the amount of CO₂ produced during metabolism and the O₂ being consumed, (VO₂ Max MET) Metabolic equivalents of 1 MET = 3.5 mL/kg/min, AT VO₂/Pred (%), Anaerobic Threshold, the point at which metabolism shifts from aerobic to anaerobic, (VO₂.Max,VO₂WorkSlope.mL.min.watt) VO₂ over

workrate, (VO₂.Max.VE.VCO₂), abnormal ventilatory response to exercise is identified by an increased slope of ventilation vs. CO₂ production to incremental workload (VO₂.Max.SpO₂), Oxygen saturation at peak, PF Pre SVC (L), the maximum volume of air that can be exhaled slowly after slow maximum inhalation, PF Pre IC (L) inspiratory reserve volume (IRV), PF Pre ERV (L) expiratory reserve volume (ERV), PF Pre FEV₁ (L) the volume of air that can forcibly be blown out in one second, after full inspiration, PF Pre FVC (L) volume of air that can forcibly be blown out after full inspiration, PF Pre FEV₁/FVC (%) calculated ratio used in the diagnosis of obstructive and restrictive lung disease, PF Pre FEF Max (L/sec) Forced expiratory flow (FEF) PF Pre Expiratory Time (sec) 'amount of time it takes for the patient to clear all the air from their lungs, PF Pre DLCOunc (ml/min/mmHg) Diffusing capacity of the lungs for carbon monoxide, a measure of how much oxygen travels from the alveoli of the lungs to the blood stream, PF Pre FRC (N₂) (L) functional residual capacity, PF Pre RV (N₂) (L)residual volume, PF Pre TLC (N₂) (L) total lung capacity, LVOT Left Ventricular Outflow Tract Diameter , MV-AV Mitral Valve-Aortic Valve Velocity and PFVI Pulmonary Flow Velocity. Continuous and categorical data were analyzed by T-test or Chi-Square analysis as appropriate. Preoperative testing results were then correlated to postoperative weight loss results by Spearman correlation. Significance was set as p<. 05. All data were analyzed using GraphPad Prism v6.01.

Results: Average patient demographics included: Age 42 Years, BMI 44, 82% female, 64% Caucasian, BMI Reduction Postoperative 14. The following variables were noted to be abnormal preoperatively, (%): Rest.sysBP.mmHg (31.3), Rest.diaBP.mmHg (19.6), VO₂.Max.sysBP.mmHg (15.1), VO₂.Max.diaBP.mmHg (2.6), Rest.HR. BPM (8.03), VO₂.Max.HR.Pred (27.7), Rest.RR.br.min (21.4), VO₂.Max.RR.br.min (10.7), VO₂.Max.BR (100), VO₂.Max.VO₂.Pred (37.5), VO₂.Max.RER (31.3), VO₂.Max.METS (15.2), VO₂.Max.VO₂WorkSlope.mL.min.watt (76.8), VO₂.Max.VE.VCO₂ (3.6), VO₂.Max.Max.SpO₂ (25), AT.VO₂.Pred (19.6), PF.Pred.Pre.SVC.L, PF (1.8), Pred.Pre.IC.L, PF (93.8), Pred.Pre.ERV.L (17.9), PF.Pred.Pre.FEV₁.L (25), PF.Pred.Pre.FVC.L (0.8), PF.Pre.FEV₁.FVC (7.1), PF.Pred.Pre.FEF.Max.L.sec (16.1), PF.Pre.Expiratory.Time.sec. (97.3), PF.Pre.DLCOunc.ml.min.mmHg (100), PF.Pred.Pre.DLCOunc.ml.min.mmHg. (50), PF.Pred.Pre.FRC.N₂.L. (91.1), PF.Pred.Pre.RV.N₂.L. (74.1), PF.Pred.Pre.TLC.N₂.L. (54.5) PF.Pre.RV.TLC.N₂

(100). Variables significantly correlated with surgical weight loss included: PF PreFEV1 (-0.77), PF PreFVC (-0.74), Rest CO (-0.83). Furthermore, PF Pre-Final was also significantly correlated to Systolic Blood Pressure change (-0.9). In addition, cardiac echo results demonstrated significant correlation to change in BMI including LVOT Diameter (0.8), MV-AV Velocity (0.75) and HR (-0.73) and PFVI (-0.83).

Conclusion: This study finds multiple and significant preoperative abnormalities in patients undergoing bariatric surgery. These abnormal findings include cardiac, pulmonary and exercise tolerance parameters that may have important implications for both patient safety and effectiveness. The correlation of cardio-pulmonary parameters like preoperative CO, FEV1, FVC, LVOT Diameter, MV-AV velocity, HR And PFVI to surgical weight loss and comorbidity remission indicate opportunities to enhance surgical weight loss. Surgical prehabilitation such as cardio-pulmonary training for these parameters could improve weight loss and comorbidity remission. Abnormal preoperative cardiopulmonary parameters can have complication consequences. Recognition of these abnormal values can guide the use of risk mitigation strategies. Cardiopulmonary Metabolic Exercise Tests and Resting Echocardiograms can enhance bariatric surgery outcomes for safety and effectiveness.

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Pregnancy following bariatric surgery: the effect of time-to-conception on long term weight loss

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Background: At our medical center, female patients who have undergone bariatric surgery are advised to defer pregnancy for two years after surgery, due to the theoretical risk that becoming pregnant during the period of rapid weight loss after surgery will adversely affect long term weight loss.

Methods: We examined our database of bariatric surgery patients from a large, urban, public hospital from March 2011 to January 2014. Out of over 2000 patients, we identified 49 women who became pregnant and carried to term after undergoing bariatric surgery. 29 pregnancies occurred in women who had undergone bariatric surgery less than 2 years prior to conception, and 20 occurred in women

who had undergone bariatric surgery greater than 2 years prior to conception. Weight data were recorded and BMI was calculated for each patient from pre-op to post-delivery. Percentage of excess weight loss (%EWL) based on an ideal BMI of 25 at three different time points after delivery (3-12 months, 1 - 2 years, >2 years) was compared for the two groups.

Results: The two groups were statistically similar with regards to baseline weight, BMI, and BMI loss from surgery to conception. The mothers with <2 years between bariatric surgery and conception had a higher percentage of RYGB and LSG surgeries ($p=0.020$). %EWL was significantly higher for the <2 year group at 3-12 months post-delivery (57.1% vs. 37.5%, $p=0.028$), 12-24 months post-delivery (61.1% vs. 37.7%, $p=0.012$), and >2 years post-delivery (59.9% vs. 38.7%, $p=0.044$). However, when stratifying by surgery type, there were no significant differences in %EWL between the two groups at any time point (Table). A multiple linear repeated measures model showed that mothers in the <2 year group had significantly greater %EWL after adjusting for age of mother, surgery type, and baseline BMI (+5.6% EWL at 3-12 months post-delivery, +11.1% at 12-24 months, and +16.5% at >2 years; $p=0.031$).

Conclusions: In this study, long term weight loss was significantly greater in women who conceived earlier than 2 years after undergoing bariatric surgery. This result may also have been affected by surgery type, as there were higher percentages of RYGB and LSG in the early pregnancy group. However, after controlling for this difference between the two groups, there remained a significant difference in %EWL at all three time points, suggesting that patients who become pregnant within 2 years after surgery may have greater long term weight loss.

A5227

CHANGES IN GHRELIN AND RESISTIN LEVELS FOLLOWING BARIATRIC SURGERY: ONE ANASTOMOSIS GASTRIC BYPASS vs SLEEVE GASTRECTOMY

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Aim and Background: Bariatric surgery is being popularized globally with the advancements made in minimally invasive surgery. Currently it is the gold standard for treatment of morbid obesity and individuals who have systemic disease linked with obesity. Sleeve gastrectomy (LSG) is a vertical gastrectomy that aims to excise the fundus of the individual completely and provide an anatomic basis for restriction. In the one anastomosis gastric bypass (OAGB) the fundus is left in place yet a small gastric pouch is prepared for restriction and combined with a Billroth type 2 anastomosis 150-200 cm distal to the ligament of Trietz. Ghrelin and resistin are the two molecules that are being actively investigated for possible role in the mechanism of obesity and the changes in the levels following bariatric surgery. Fundus is the main area of ghrelin secretion and resistin is secreted from the white adipose tissue which is abundant in the obese individuals. Thus OAGB and LSG can be hypothesized to provide different humoral effects. The aim of the present study is to investigate the levels of resistin and ghrelin following two novel bariatric procedures acting differently: LSG and OAGB.

Patients and Methods: From the 500 bariatric cases performed (LSG/OAGB:298/202), 80 primary bariatric cases (LSG/OAGB:40 /40) were included in the study and prospectively evaluated for the pattern of changes on serum resistin and ghrelin in the preoperative and postoperative 1st week, 1st month, 3rd month periods. Demographic data of the individuals including BMI, weight, weight loss, excess weight loss were also prospectively collected. Any correlation between the demographic parameters of the patients such as weight loss and serum ghrelin and resistin levels were also investigated.

Results: (Figures 1 and 2): The mean age of the patients in the LSG (n=40/25 Female) group were 35.2 (19-60) years. Mean BMI were 43.3 (40-53.2) kg/m². Preoperative weight were 117.3 (93-144) kg. The postoperative weight were 108.6 (85-135) kg, 102.2 (79.1-128.9) kg, 95.5 (71.3-120.6) kg in the postoperative 1st week, 1st month and 3rd months, respectively. Ghrelin levels were 334.2 (36.6-972.1) pg/ml, 204.8 (36.4-356.3) pg/ml, 188.9 (0-472.3) pg/ml and 225.1 (30.2-347.7) pg/ml in the preoperative period, postoperative periods, 1st week, 1st month and 3rd months period; respectively ($p < 0.05$, when all time periods are compared with each other). Resistin levels were 2607.8 (861.8-5389) ng/ml, 3584.5 (1069-8079) ng/ml, 2603.9 (712.5-5699) ng/ml and

2636.2 (990-5402) ng/ml in the preoperative period, postoperative periods 1st week, 1st month and 3rd months period; respectively ($p < 0.05$ when all time periods are compared with each other). The mean age of the patients in the OAGB (n=40/20 Female) group were 38.2 (22-65) years. Mean BMI were 49 (40.6-66.9) kg/m², preoperative weight were 133.2 (102-193) kg the postoperative weight were 122.1 (94.9-182.8) kg, 112.7 (86.1-171.7) kg, 105.3 (79.3-161.9) kg in the postoperative 1st week, 1st month and 3rd months; respectively. Ghrelin levels were 310 (145.9-548.3) pg/ml, 250.7 (57-488.1) pg/ml, 266.5 (56.2-525.9) pg/ml and 326.9 (127-964.3) pg/ml in the preoperative period, postoperative periods 1st week, 1st month and 3rd months period; respectively ($p < 0.05$ when all time periods are compared with each other). Resistin levels were 2473 (891.9-6426) ng/ml, 3098 (1015.8-6028.3) ng/ml, 2541 (1015.1-5719.8) ng/ml and 2843.9 (790-8481.5) ng/ml in the preoperative period, postoperative periods 1st week, 1st month and 3rd months period; respectively ($p < 0.05$ when all time periods are compared with each other). There was a significant difference in terms of changes in resistin and ghrelin levels among the OAGB and LSG group ($p < 0.001$). OAGB has superior weight control when compared to LSG group ($p < 0.05$).

Conclusions: Both LSG and OAGB seems to have a good weight control although OAGB is superior to LSG. Furthermore we observe a rise in the ghrelin levels after 1st postoperative month in both groups and it does not affect the trend of weight loss in both groups. Resistin seems to increase initially and drop after postoperative 1st month in our study which seems to be explained by the reduced adipose tissue levels in the individual. However whether these parameters have a long-term effect in follow-up of the individuals and late recurrences still needs to be evaluated with longer follow-up periods.

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Patient adherence to vitamin therapy following bariatric surgery

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Postoperative vitamin supplementation is important for better health outcomes in bariatric surgery

patients. We aimed to quantitatively assess patient rates of adherence to the post-operative vitamin regimen, using MEMScap® technology. Patients, aware that they were being monitored, were instructed to take a vitamin supplement daily, 3 times a day for 50 days following bariatric surgery. Data for 24 patients were gathered and stored in the MEMScap®; each time a patient took the vitamin over the 50 days. Internet surveys were sent out weekly to the patients to assess satisfaction or displeasure with the regimen, including offering an area to write in specific side effects. Adherence rates were generally poor, overall, with just 44% of doses taken as prescribed over the course of the study. Patients had a mean adherence rate of 58% over the first week, which fell to 39% by the last week. The most common complaints about using the medication were side effects (37.5%), inconvenience of use (30.33%), and interruption of the day (12.5%). Those who specifically wrote in the side effect of nausea had the poorest adherence rates over the course of the study, taking just 2.4% and 15.3% of prescribed doses. The reasons for poor adherence should be studied, and possible interventions explored, to improve vitamin consumption rates in the bariatric surgery patient population, thereby improving postoperative outcomes.

A5230

Influence and effects of the diet and bariatric surgery on the biological clock of peripheral tissues.

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One area of considerable interest is the degree to which eating patterns influence energy regulation and the risk of obesity. Animal studies have indicated that the timing of food intake may be linked to energy regulation. The vast majority of research on eating patterns among humans has focused on breakfast skipping versus consumption, particularly in children. Although the data are not completely consistent, most studies have concluded that, among children, skipping breakfast is associated with a higher risk of obesity, as well as lower overall diet quality and poorer cognitive performance. Dysregulation of nutrient availability can have an impact on survival during a fast or lead to obesity and related pathologies, such as type 2 diabetes, in response to overnutrition. The meal times (and number of meals consumed) differ greatly from culture to culture and through time.

Indeed, timing of food intake is a modifiable behavior that may influence energy regulation and consequently the risk of obesity. A number of recent studies in animals have linked energy regulation and the circadian clock at the molecular, physiological and behavioral levels, findings that raise the possibility that the timing of food intake itself may play a significant role in weight gain. The aim of this study was to test the hypothesis that significant and sustained weight loss, induced by bariatric surgery and diet could modify the expression of clock genes, metabolism and physiology ones on human stomach. Stomach explants from morbidly patients with obesity disease obtained during bariatric surgery, were taken and placed into 24-well plates with DMEM and kept in an incubator at 37°C for 1h to stabilize the tissues. After that, the explants were incubated with DMEM or oleic acid 100 µM during 6h and change every 6h for a full day. The samples considered control, remained overnight with DMEM. The samples with oleic acid remained the 6h but not continuously, each test samples were kept treatment according to the time show: Time 0= initial time Time 21h or 9pm Time 3h or 3am Time 9h or 9am Time 15h or 3pm Several epidemiological studies have suggested that the perturbation of circadian rhythm has adverse metabolic consequences (e.g., dyslipidemia) in humans. At the molecular level, circadian rhythms are encoded by an autoregulatory loop composed of a set of transcription activators (BMAL1 Brain and Muscle Arnt Like 1/CLOCK (Circadian Locomotor Output Cycles Kaput) that induce expression of repressors (PER (period) /CRY (cryptochrome). The mammalian molecular clock is not only expressed within the master suprachiasmatic nucleus pacemaker neurons, but also within nearly all cells. We have identify clock genes presence on stomach. The clock genes on the stomach tissue are regulated by oleic acid and by bariatric surgery. Not only the amount or type of food we ingest, but also the timing of food consumption seems to play a crucial role in the development of obesity and associated metabolic disorders. Circadian clocks are widely accepted to act as the timekeeping system of nearly every living organism, ensuring that physiological processes are carried out at the right time of day or night. However, the concept that the stomach is home to one of the food-entrainable oscillators that predicts the availability of food, especially when food becomes restricted, is the first time that is reported to be a peripheral clock.

A5231

Adjustable Gastric Banded Plication versus Sleeve Gastrectomy: The Role of Gastrectomy in Weight Loss

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Introduction: Laparoscopic Adjustable gastric banded plication (LAGBP) is a procedure that although it has held promising results has not been adopted widely. It has a stomach size that in volume compared to the sleeve gastrectomy (SG) are certainly equivalent. The question that remains is how much difference gastrectomy has on weight loss.

Methods: A retrospective matched cohort analysis of LAGBP and SG patients was found through matching BMI and Sex for each LAGBP to a SG patient. BMI lost, percentage excess weight loss (%EWL), and total weight loss percentage (%TWL) was analyzed. Data was analyzed through descriptive statistics and non-linear regression analysis.

Results: Patients who received SG lost more BMI, %EWL, and %TWL over 18 months and difference was statistically significant ($p < .05$). However, SG patients stopped losing significant amounts of weight between 12 and 15 months, and LAGBP patients stopped losing significant amounts of weight between 12 and 15 months. SG patients lost more weight until 6 months when LAGBP lost the same amount of weight after that point.

Conclusion: The addition of the gastrectomy in weight shows that weight loss is more than stomach volume. SG patients will lose more weight early post operatively, but the addition of the band potentially allows LAGBP patients to continue their weight loss further.

A5232

The Impact of a Pre-operative Exercise Program on Patients Awaiting Bariatric Surgery

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Background: Obesity is a worldwide epidemic and bariatric surgery is an efficacious treatment. While

evidence supports the association between physical activity and weight loss following bariatric surgery, there is a lack of evidence for preoperative exercise.

Objective: The objective of our study was to evaluate the short term benefits of a preoperative exercise program in patients awaiting publicly-funded bariatric surgery in Manitoba. Our primary outcome was improvement in six minute walk test (6MWT). Our secondary outcomes included changes in anthropometric measurements, strength testing, and quality of life measurements.

Hypothesis: We hypothesized that a preoperative exercise intervention would result in improved short-term exercise capacity and general fitness in patients awaiting bariatric surgery, as measured by an improved 6MWT, and improvement in secondary outcomes.

Methods: Fifty four patients were enrolled in the study. Twenty-nine patients were randomized to the control group, which consisted of standard preoperative care. Standard care consisted of evaluation by a multidisciplinary team, exercise counselling with a kinesiologist and participation in Craving Change™, a behavior modification program. Twenty-five patients were randomized to the intervention group, which consisted of a 12 week supervised exercise program in addition to standard preoperative care. Patients in the supervised exercise program were required to exercise three times per week and document their progress in an exercise log book.

Results: There were ten drop outs from the intervention group (40%) and eleven drop outs from the control group (37%). The average attendance for the intervention group was 27.2 of 36 exercise sessions (75.6%). There was a statistically significant improvement in 6MWT between the intervention and control groups (Change in Control -4.88 m, $p = 0.63$; Change in Intervention 27.46 m, $p = 0.01$; Absolute difference between intervention and control = 32.34 m; $p = 0.03$). There were no significant differences in any secondary outcome: change in BMI (-0.17 kg/m²; $p = 0.78$), chair to stand (1.14 repetitions, $p = 0.31$), hand grip strength (0.98 kg, $p = 0.59$)).

Conclusion: A preoperative exercise intervention was associated with a statistically significant improvement in 6MWT in patients awaiting bariatric surgery. Future research on this cohort will examine if a preoperative exercise program will impact fitness outcomes after bariatric surgery.

A5233

Bariatric Surgery Reduces Prescription Medication Lists and Provides Significant Estimated Savings to Populations with Morbid Obesity

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Higher prescription expenditures are incurred by patients with obesity secondary to increased comorbidity prevalence. Literature suggests bariatric surgery is efficacious and cost-effective, but there is a paucity of information regarding medication list reductions and prescription savings experienced by patients status-post surgery. This single institution, retrospective chart review ($n=33$) evaluated and quantified prescription medication list reductions and subsequent savings in patients undergoing Roux-en-Y gastric bypass (RNY) or vertical sleeve gastrectomy (VSG). 88% of patients were female with an average age of 47.8±13.7 years. Bariatric surgery reduces prescription medications from 7.0±0.7 to 4.6±0.6 at 6 months ($p = 0.02$). These reductions are stable at 1 year ($p = 0.03$). There is no significant difference between 6 month reductions achieved via VSG or RNY ($p = 0.31$). Extrapolated prescription savings are estimated at approximately \$200 per patient per month.

A5234

The relationship between susceptibility of gastric cancer and leptin/leptin receptor gene polymorphisms in Korea

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Purpose: Leptin plays an important role in the control of body weight and also has a growth-factor-like function in epithelial cells. Abnormal expression of leptin and leptin receptor may be associated with cancer development and progression. We evaluated the relationship among leptin and leptin receptors polymorphisms, body mass index (BMI), serum leptin concentrations, and clinicopathologic features with gastric cancer and determined whether they could be the risk factor of gastric cancer.

Methods: We measured the serum leptin concentrations of 48 Korean patients with gastric cancer and 48 age- and sex-matched controls. By polymerase chain reaction-restriction fragment length polymorphism, we investigated one

leptin promoter G-2548A genotype and four leptin receptor gene polymorphisms at codons 223, 109, 343, and 656.

Results: There was no significant difference between the mean leptin concentrations of the patient and control groups, while BMI was significantly lower in gastric cancer cases (22.9 ± 3.6 vs. 24.5 ± 2.8 kg/m², $P = 0.021$). There was significant association between the LEPR Lys109Arg genotype and gastric cancer risk, heterozygotes for GA genotype had been proved to increase the risk of gastric cancer, and its corresponding odds ratio was 2.926 (95% confidence interval, 1.248 to 6.861).

Conclusion: Our results suggested that LEPR gene Lys109Arg polymorphism is associated with gastric cancer in Korean patients.

A5235

Prevalence of Non Alcoholic Fatty Liver Disease in an Obese Population: Expected versus Actual Correlation

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Background: Morbid obesity and its associated metabolic diseases are on the rise in the United States. Of the many co-morbidities related to obesity, Non-alcoholic Fatty Liver Disease (NAFLD) is among the most prevalent. NAFLD is categorized as a buildup of fat within the liver that occurs independent of heavy alcohol consumption. This buildup of fat better known as steatosis generally has no signs or symptoms for diagnosis without standard liver biopsy. In severe cases of NAFLD patients can experience inflammation that can even progress to full liver failure. With the apparent threat of liver failure, NAFLD is a significant co-morbidity of obesity that usually resolves after receiving weight loss surgery. Many believe that BMI (body mass index) has a direct correlation to NAFLD, while others suggest that the degree of NAFLD is related to the metabolic function of the patient and not their BMI. The purpose of this study is to understand the possible correlation of BMI, liver size, and degree of NAFLD noted upon sonogram reading and biopsy.

Methods: The following study consists of one-hundred-sixty-three ($n=163$) bariatric patients (Male=65 Female=98) with ages ranging from 16-59 years of age who received various bariatric

procedures (mainly gastric sleeve, gastric bypass). Patients charts were reviewed and noted for frequency of alcohol consumption, if any. For the purpose of this study anyone consuming more than the equivalent alcohol level of 4 beers a week (56 grams of alcohol) were excluded from the study all other patient alcohol consumption was noted. All preoperative sonogram studies were compiled and analyzed for abnormalities (enlarged liver, fatty liver). Patients who received liver biopsy due to sonogram reading indicating possible fatty liver were enrolled. All liver biopsies were obtained using an edo-shear as a wedge biopsy, and readings were compiled and graded for degree of NAFLD. All patients received weight check, blood workup and general examination pre-operatively and post operatively at 1 week, 1 month, 3 months, 6 months and 1 year. All patients were enrolled in the private bariatric practice at Advanced Surgical and Bariatrics of NJ and subject to all requirements including nutrition, exercise, and support group regimens. Patients were assessed for excess weight loss, resolution of comorbidities, complications, vitamin deficiencies, and general quality of life postoperatively.

Results: Using a Person's moment correlation test, BMI and degree of NAFLD were plotted. Our results ($P=0$) suggest that there is no direct correlation between severity of NAFLD and BMI. On the other hand nearly, 120 of the enrolled 163 patients (74%) presented with a degree of NAFLD confirmed through the pathology report of their liver wedge biopsy. Patients with BMI's as low as thirty-one (31) presented with severe NAFLD while many patients with BMI of sixty (60) and above had no NAFLD or enlarged liver. However, of the patients with significant liver enlargement, 41% had Diabetes (Type I & II) while others either had another associated comorbidity of obesity such as high triglycerides (15%) or no comorbidities at all. All data and correlation graphs tabulating weight reduction.

Conclusions: NAFLD, although commonly associated with and increased BMI is not directly correlated to the severity of NAFLD. In other words, an increase in BMI does not increase the severity of NAFLD. This is not to be confused with the onset of NAFLD. Since the following study included an obese population and the majority of the patients (74%) were diagnosed with some degree of NAFLD, the suggestion that NAFLD onset is positively correlated with BMI is supported by our data. As such, the theory of a metabolic basis as a cause for the differentiation in severity of fatty liver should be

further researched to determine the etiology of NAFLD.

A5236

IMMUNOLOGIC CHANGES AFTER BARIATRIC SURGERY: IS IT A TRIGGER FOR SYSTEMIC AUTOIMMUNE DISEASES?

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FUNDACION VALLE DEL LILI¹

Background/ Objective: Obesity is a proinflammatory condition where some cytokines play an important role. We have described the development of systemic autoimmune diseases after bariatric procedures. However, immunologic variations associated to weight loss are unknown. Our aim is to describe immunologic profile changes in obese patients following bariatric surgery.

Methods/Design: Obese patients treated by bariatric surgery were evaluated at baseline and at 4 and 8 months in a prospective cohort study. Immunologic profile (complement C3-C4, ANAs, IgG/IgM anti-Cardiolipin antibodies (aCL), Anti-CCP, and RF) were evaluated at each time. Peripheral blood distribution of B and T lymphocytes was determined by flow cytometry. Leptin and adiponectin were measured by Elisa technique. All patients did not have history of AIDs.

Results: Thirty-four patients were included (88% women). Mean age at baseline was 38.3 years. Pre-surgical mean BMI was 42.8 \pm 3.6; at month 4: 35.1 \pm 3.8 and month 8: 33.5 \pm 5.3 ($p=0.001$). Several immunologic changes were seen between baseline and 8 months: Four patients (11.8%) with baseline negative ANAs had positive results. One patient had baseline ANAs 1:80 and changed it to 1:160. Anti-CCP was slightly positive in one patient at baseline and the titers increased 10 times. C3 and C4 decreased in all patients: 164 \pm 40.6 μ g/dL vs. 112.4 \pm 31.4 ($p<0.001$) and 29.3 \pm 10.1 mg/dL vs. 22.5 \pm 7.1 ($p=0.0009$), respectively. IgG aCL decreased from 7 (6-10.5) to 3 GPL (2.6-5.2) ($p<0.001$). IgM aCL and RF did not change during follow-up. Number and percentage of T CD4+ cells increased at 8 months ($n=30$) (median (interquartile range)): 1074 (860-1316) cells/mL vs. 1217.5 (838-

1510) cells/mL ($p < 0.0016$) and (average \pm SD) 44.6 \pm 8.3% vs. 45.8% ($p < 0.0179$) for percentages comparisons. At 8 months, T CD8+ percentage decreased ($p = 0.0002$) and CD4/CD8 T cells ratio significantly increased (median 2.2 (1.7-2.7) vs. 2.4 (1.8-2.8); ($p = 0.0001$). B cells number/percentages remained stable during the follow-up. Finally, leptin decreased at 8 months in all patients: 45.7 \pm 9.14 vs. 23.5 \pm 12.6 ($p < 0.001$) and adiponectin increased from 6.6 (5 - 10) to 10 (6 - 17) ($p = 0.0001$).

Conclusions: Our results showed immunological changes after bariatric surgery (mainly in C3 and C4 levels, positivity of ANAs and distribution of T cells). Clinical implications of these findings must be analyzed in the follow-up of our cohort. References 1. Canas, C. A. *et al.* Is Bariatric Surgery a Trigger Factor for Systemic Autoimmune Diseases? *J. Clin. Rheumatol.* 22, 89-91 (2016).

A5237

FIFTEEN YEARS EXPERIENCE BRAZILIAN MULTICENTRIC STUDY GROUP OF ENDOLUMINAL THERAPY FOR THE TREATMENT OF OBESITY

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Background: Intra-gastric balloon (BIB) has been used in obese patients as a restrictive gastric procedure inducing early satiety and weight loss. This prospective study assesses both the safety and effectiveness of BIB in the treatment of obese patients.

Method: From Nov 2000 to June 2015 after Brazilian Ministry of Health approval of BIB protocol, 2051 overweight and obese patients were treated with the BIB. 2006 of them completed a 6 month follow-up: 542 male (BMI=42.8 \pm 910.7 kg/m²) and 1464 female patients (BMI=35.5 \pm 7.8 kg/m²) mean (BMI=38.5 \pm 9.8 kg/m²). All patients were encouraged to take part in a multidisciplinary program involving.

Results: After 6 months follow-up subjects showed significant reductions in percent excess weight (%EWL= 44.8 \pm 30.5) and percent of total weight loss (%TWL=12.5 \pm 6.7). The main side effects were nausea/vomiting 861 cases, (42%), epigastric pain 430 cases, (21%), requiring prosthesis removal in 31 patients (1.51%). Minor complications were reflux

esophagitis 225 cases (11%), and symptomatic gastric stasis 164 cases (8%) which were clinically controlled. Balloon impaction occurred in 3 cases (0.14%) and in one patient (0.04%) there was spontaneous deflation of the balloon leading to a small-bowel sub occlusion which was solved by laparoscopy.

Conclusion: The BIB is effective to temporarily control of obesity, inducing a %EWL of approximately 45%. It is not associated with mortality and shows minimal risk of major complications. Results regarding subsequent follow-up (after BIB removal) are necessary to a better assessment of its effectiveness.

A5238

EARLY DISCHARGE IN 3189 CONSECUTIVE PATIENTS AT THREE YEARS IN A METABOLIC AND BARIATRIC CENTER OF EXCELLENCE IN BRAZIL

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Introduction: The risks of complications and mortality in bariatric surgery are associated to many factors regarding both patients' condition and surgical procedure. For this reason we propose criteria able to promote early discharge (discharge in 36 hours after the admission), thus reducing costs and risk of complications associated to hospital stay.

Methods: Inclusion criteria were (1) absence of indication to ICU, (2) patients living in Sã Paulo, and (3) absence of intra-operative complications. Exclusion criteria were patients with 3 or more comorbidities. In order to compare results concerning such criteria, we have compared the mean time of hospitalization of our patients operated in 2013 (n= 649), 2014 (n= 1171), and 2015 (n= 1369).

Results: Of the 3189 bariatric surgeries performed since January 2013 to December 2015; 2360 patients (74%) were included in our criteria of early discharge and 2171 patients (91,9% criteria included patients) received early discharge. Mean time of hospitalization of those patients was 60 h (2013), 37,3 h (2014) and 29,2 h (2015). Compared to the patients operated in 2013 (mean time of hospitalization = 60 hours), patients screened by

these criteria had a significant reduction in time of hospitalization.

Conclusion: Comparing tree groups, we have found that the adoption of early discharge criteria in patients submitted to bariatric surgery can provide a useful method to reduce the mean time of hospitalization, thus potentially able to reduce costs and risks associated with a longer hospital staying .

A5239

Serum 25-Hydroxy vitamin D levels and Metabolic Health Status in Obese individuals in Pakistan.

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Vitamin D deficiency is leading to skeletal abnormalities such as osteopenia, and osteoporosis in adults and rickets in children. Certain cancers autoimmune diseases metabolic syndrome, obesity and hypertension have also reported as result of vitamin D deficiency. Decreased levels of Serum 25-Hydroxy vitamin D have found prevalent in obese population. We aimed to study 25-hydroxyl vitamin D [25(OH) D] levels in obese individuals and its relationship with other clinical parameters. This is a retrospective chart review of outpatient medical record from three private hospitals. Subjects were divided in two groups: metabolically healthy obese (MHO) and metabolically unhealthy obese (MUO), using the homeostasis model assessment of insulin resistance criteria. Total of 164 obese subjects according to Asian criteria were included in this analysis. The average body mass index was 26.24 ± 4.88 kg/m². Sixty nine subjects (41.97%) met the criteria for MHO. MHO subjects have lower BMI and waist circumference compared to MUO. Overall there was high prevalence, 56 % of vitamin D deficiency (<20 ng/ml) and 31.4% was insufficiency (20.0-29.9 ng /ml). 25(OH) D levels were inversely correlated with MBI, body weight, waist circumference and HBA1C levels but not with blood pressure, total cholesterol, HDL, TGs or LDL. In obese Pakistani individuals 25 (OH) D level were not related to metabolic health status or insulin resistance but correlated with the degree of adiposity.

A5240

Expression of hepatocellular carcinoma-related genes is increased from the early stages of non-alcoholic fatty liver disease.

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Introduction: Scientific evidence clearly supports that obesity is a risk factor to develop cancer in a tissue specific manner and to die from it. Thus, obesity and its hepatic manifestation, Non Alcoholic Fatty Liver Disease (NAFLD) are strongly associated with hepatocellular carcinoma (HCC) development, although molecular mechanisms supporting this association are only partly understood.

Patients and methods: A liver biopsy was obtained from 27 patients submitted consecutively to bariatric surgery. Histology samples were analyzed by the same pathologist, and classified into normal liver, mild/moderate steatosis and severe steatosis/steatohepatitis. Fourteen cases showing mild to moderate steatosis and 7 normal liver samples were included in the study. Informed consent was obtained in all cases. Total RNA from the liver biopsies was isolated and quantitative RT-PCR was performed to analyze the expression levels of different genes. The relative amount of target mRNA was determined after normalization against a reference gene (Gusb) in each sample. The study was approved by the Ethical Committee of the institution.

Results: A panel of more than 50 genes was analyzed and of them, 16 appear to be differentially expressed between individual with a normal liver histology and individual with hepatic steatosis. Noteworthy, we found an 8 fold increase of AFP expression levels, a standard biomarker of HCC, in patients with hepatic steatosis, as well as other genes strongly associated with the hepatocarcinogenic process, such as Transforming Growth Factor (TGF-beta2, 200 fold increase), Insulin Growth Factor2 (IGF2, 2.4 fold increase) and

cytokeratin (CK18, 6.2 fold increase). Other findings will be discussed.

Conclusion: Our data suggest that morbidly obese patients with a mild/moderate liver steatosis already present a profound alteration of several genes associated with hepatocarcinogenesis. These data provide some insights to decipher the complex molecular mechanisms linking obesity, NAFLD and HCC.

A5241

Predictors of Sleep Apnea Resolution after Bariatric Surgery

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Background: Sleep apnea is a common comorbidity associated with obesity, and has been shown to resolve following bariatric surgery. The aim of this study was to determine the relative strength of factors that predict resolution of sleep apnea after two common bariatric procedures.

Methods: This is a retrospective study conducted at the Johns Hopkins Center for Bariatric Surgery in 1245 patients who underwent open and laparoscopic Roux-en-Y gastric bypass (RYGB) and vertical sleeve gastrectomy (VSG) bariatric surgery from November 2009 through July 2015. Pre-operative demographics and characteristics (sex, race, age, pre-operative BMI, insurance, procedure, pre-operative weight loss and comorbidities) as well as post-operative outcomes (length of stay, reoperation rate, readmission rate, weight loss and resolution of comorbidities post-operatively) were collected. Multiple logistic regression analysis was performed to determine the factors that contribute to post-surgical resolution. We compared characteristics between RYGB and VSG patients with pre-operative sleep apnea.

Results: The cohort included 741 subjects who underwent RYGB and 504 who underwent VSG. Sleep apnea was diagnosed preoperatively in 501 (40%) of patients. Pre-surgical factors associated with an increased risk of sleep apnea include age (OR=1.03, p<0.001), male sex (OR=3.38, p<0.001),

pre-op BMI (OR=1.02, p<0.001), open surgery (OR=1.62, p=0.002), diabetes (OR=1.97, p<0.001), dyslipidemia (OR=2.01, p<0.001), hypertension (OR=1.83, p<0.001), and GERD (OR=1.68, p<0.001). Follow-up data was available for 910 (73%) patients at 6 months and 566 (46%) patients at 1 year. Among patients with pre-operative sleep apnea, follow-up was available for 358 (72%) at 6 months and 215 (43%) at 1 year. Sleep apnea resolved in 224 patients (63%) after 6 months and 182 patients (85%) by one year. Resolution of sleep apnea was associated with greater weight loss, defined as change in BMI at one year (-16.2 kg/m² vs -13.0 kg/m², p=0.036), and was less likely among older patients (OR=0.98, p=0.018). There was a non-significant trend for greater resolution of sleep apnea with RYGB vs. VSG at 6 months (66% vs 58%; p=0.119) and 1 year (87% vs 80%; p=0.167). Race, open surgery, sex, pre-op BMI, diabetes, hypertension, dyslipidemia, and gastro-esophageal reflux disease were not associated with higher rates of resolution of sleep apnea.

Conclusion: Bariatric surgery was highly effective in treating patients with sleep apnea. The effect was most pronounced in younger patients and was associated with greater weight loss. The non-significant trend toward greater resolution of sleep apnea among RYGB vs VSG patients was probably due to greater weight loss in the RYGB patients.

A5242

Effects of Weight Loss on Mammographic Density Change Over 1 Year

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Background: Mammographic density is determined by the amount of connective and epithelial tissue relative to fat as viewed on a mammogram and is a marker of breast cancer susceptibility. Obesity is linked to increased risk of postmenopausal breast cancer, yet also is associated with lower percent density. How weight loss affects mammographic density is unknown.

Methods: We followed 84 women seeking screening mammography (ScM) and 9 women seeking bariatric surgery (BSx) within the same medical center in Springfield, MA. All participants had a screening mammogram and height and weight measurements at baseline and approximately one year later. BSx patients had their surgery completed between the

two study visits. LIBRA software was used to provide objective, quantitative mammographic density measurements. Linear regression was used to calculate adjusted mean change in density measures within each group.

Results: BSx women were of similar age to ScM participants (56.4 vs. 53.5 years, $p=0.33$). On average, BSx women lost 21.7 (SD 11.9) kg while ScM women lost only 0.1 (SD 10.0) kg ($p<0.001$). In analyses adjusted for age and time between mammograms, percent density increased 6.3% (SD 3.5%) in the BSx group and 2.7% (SD 1.1%) in the ScM group ($p=0.33$); this difference was attenuated with additional adjustment for weight change (2.1% [SD 4.3%] vs 3.1% [SD 1.1%], respectively; $p=0.84$). The BSx group also experienced a greater increase in absolute dense area (17.9 cm² [SD 7.6 cm²]) compared to the ScM group (4.7 cm² [SD 2.5 cm²]) in analyses adjusted for age and time between mammograms; this difference also was attenuated with additional adjustment for weight change (9.5 cm² [SD 9.4 cm²] vs 5.6 cm² [2.5 cm²]; $p=0.70$).

Conclusions: Mammographic density increased following bariatric surgery, with these effects explained by change in weight. It is unlikely, however, that weight loss caused a true increase in dense breast tissue. Weight loss and the resulting loss of fat tissue in the breast may allow for improved compression of the breast during mammography and thus increased visualization of dense breast tissue. If true, this could have important implications for the accuracy of screening mammography in obese women.

A5243

Pre-operative Predictors of Extended Hospital Stay Following Bariatric Surgery

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Background: Bariatric surgery is the most effective treatment for obesity. As more patients turn to bariatric surgery as the treatment choice for obesity, it is important to better understand the factors that influence outcomes. One significant clinical variable that helps to assess surgical outcomes and health

care costs is hospital length of stay (LOS). The aim of our study was to investigate pre-operative predictors of hospital LOS following bariatric surgery.

Methods: Using the Johns Hopkins Center for Bariatric Surgery database we retrospectively identified 1,323 patients > 17 years of age undergoing both open and laparoscopic Roux-en Y gastric bypass (RYGB) or vertical sleeve gastrectomy (VSG) between November 2009 - July 2015. Patient's pre-operative demographics and characteristics as well as post-operative outcomes were collected. Patients were excluded from the analysis if they had a revision or conversion surgery. Predictor variables included sex, race, age, pre-operative BMI, insurance, procedure, and comorbidities. We categorized LOS as normal LOS (≤ 2 days) or extended LOS (> 2 days). Multivariable logistic regression models were created to analyze the factors associated with normal and extended LOS.

Results: Out of 1,323 bariatric patients, 1,241 were included. The overall median age of the entire cohort was 44 years (IQR: 36, 53). The majority of patients were female (78.3%) and most had laparoscopic procedure (82.9%). Most patients underwent RYGB ($n=742$, 59.8%) with the remaining undergoing VSG ($n=499$, 40.2%). The mean and median LOS were 2.7 days and 2 days, respectively, and 533 patients (43.0%) had an extended LOS. Extended LOS was more common following RYGB (48.4%) as compared to VSG (34.9%) ($p<0.001$). Patients undergoing RYGB or VSG differed significantly by age (43.7 vs 42.5, $p=0.005$), race ($p=0.003$), open surgery (26.0% vs 3.9%, $p<0.001$), private insurance (84.3% vs 94.7%, $p<0.001$), hypertension (69.9% vs 53.1%, $p<0.001$). In an unadjusted univariate analysis among the entire cohort, significant predictors for increased length of stay were RYGB procedures (OR=0.57, $p<0.001$), pre-op BMI (OR=1.03, $p<0.001$), sleep apnea (OR=1.47, $p=0.001$), hypertension (OR=1.44, $p=0.002$), diabetes (OR=1.52, $p=0.001$), age (OR=1.02, $p=0.002$), male sex (OR=1.33, $p=0.037$), and open surgery (OR=42.60, $p<0.001$). In a multivariate analysis controlling for all significant differences in the univariate analysis, as well as age and white race, only open surgery was a significant predictor of extended LOS (OR=40.82, 95% CI=20.96-79.48, $p<0.001$), there was no statistically difference between RYGB and VSG (OR 1.07, 95% CI 0.82-1.40, $p=0.611$).

Conclusion: We found that only open surgery was a significant predictor of extended length of stay. This provides reassurance that elevated BMI and

significant comorbidities do not necessarily predict a longer length of stay. Further studies should focus on identifying high-risk patients and subsequently on improved methods of decreasing health cost following bariatric surgery.

A5244

LAPAROSCOPIC GASTRIC SLEEVE WITH AND WITHOUT THE GASTRECTOMY – THREE YEARS FOLLOW UP.

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Introduction: Lesser curve gastric tube operation has been performed at late eighties as Magenstrasse and Mill procedure. This operation was transformed from open operation into laparoscopic subtotal gastrectomy (sleeve gastrectomy). We compare the laparoscopic sleeve gastroplasty with the sleeve gastrectomy.

Patients and methods: This is a retrospective study comparing two groups of morbidly obese patients. One hundred patients after laparoscopic sleeve gastroplasty compared with 100 patients after sleeve gastrectomy. The patients were matched by mean BMI, age and gender. Their mean BMI was 43+-8, age 38+-10 and 79% were females. Laparoscopic sleeve gastroplasty was performed by creating circular gastric window through the anterior and posterior gastric walls using circular stapler. Then using linear staplers through the gastric window a gastric lesser curve tube was performed calibrated by 32 Fr. tube. The sleeve gastrectomy group had the standard longitudinal gastrectomy using 36 Fr. Tube.

Results: Comparing weight loss there was no statistically significant difference between the gastric gastroplasty and gastrectomy. During the first year and the third year the BMI decreased by 9.1 and 8.6 units in the gastroplasty group while the gastrectomy group lost 8.9 and 8.3 units of their original BMI. While bleeding and leaks were similar at both groups 4% the leaks after longitudinal gastrectomy were clinically more severe.

Conclusions: Both Laparoscopic sleeve gastroplasty and gastrectomy are safe and effective operations. But the insignificant difference in terms of weight loss raise the doubt whether adding irreversible subtotal gastrectomy is needed to the restrictive sleeve.

A5245

Weight loss, reflux and reoperations: Our first 100 patients treated with lap. Sleeve Gastrectomy

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Background: The laparoscopic sleeve gastrectomy (LSG) is the most commonly performed bariatric procedure worldwide. For the long-term follow-up, the durability of weight loss success and the incidence of clinically relevant gastro-oesophageal reflux are still under discussion.

Method: This retrospective study comprises our first 100 patients from three bariatric centres (Medicine University Vienna, Hospital Klosterneuburg and Hospital Rudolfstiftung Vienna) treated with LSG. The mean follow-up in this study was 10 (range 8-13) years. Weight loss success, weight regain and the incidence reoperations were analysed as well as Quality of Life (QoL), which was surveyed by standardized questionnaires (BAROS, SF36, GIQOL, RSI, BQL). Gastro-oesophageal reflux was assessed by gastroscopy (including biopsy) as well as manometry and 24-hour pH-metry.

Results: Half of our patients have been examined by the day of submission of this abstract. The mean operative weight was 135 +-825kg, corresponding a mean BMI of 48 +-8kg/m². Over the time of the 10 year follow-up, a third of the patients were converted to a gastric bypass due to significant weight regain or symptomatic reflux. We offer a detailed presentation of weight loss data and the results of the gastroscopy, manometry, 24-hour pH-metry as well as data on patients' QoL.

Conclusion: In the evaluation of the first part of our 100 LSG patients with a long-term follow-up of 8 years or more, a high conversion rate to a gastric bypass was observed. To make a statement on the incidence and relevance of postoperative reflux and Barrett oesophagus after LSG, the results of this ongoing study will have to be awaited.

A5246

Three port laparoscopic sleeve gastrectomy: One surgeon's experience over two years

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Laparoscopic sleeve gastrectomy has become the most common bariatric surgery performed in the United States^{1,2,3}. While many surgeons describe the use of five to seven ports for laparoscopic sleeve gastrectomy, there have been numerous case studies utilizing a reduced number of port sites⁴⁻¹¹. Our current study explores 247 sleeve gastrectomy cases, comparing one surgeon's operative times in a single institution over two years to show the feasibility of using three ports. In comparison with five ports, we have found a reduction in operating time when utilizing only three ports for laparoscopic sleeve gastrectomy. Additional parameters such as length of stay, 30-day post-operative complications, and BMI did not show any correlation with operative time. We also note an increase in the use of three port laparoscopic sleeve gastrectomy over time, and note improved times over two years. Future research will include follow up analyses for weight loss, pain, and cosmetic satisfaction. Although there are many factors affecting sleeve gastrectomy outcomes, our current study suggests that the three port technique is a safe alternative to the traditional five port technique in selected patients and may afford the advantage of reduced operative time.

A5247

Laparoscopic sleeve gastrectomy is a sufficient and effective stand-alone bariatric procedure for superobese population, when compared with laparoscopic Roux-en-Y gastric bypass during 3-year follow-up.

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Background: Laparoscopic sleeve gastrectomy (LSG) has been gaining popularity as a safe and effective bariatric procedure for patients with morbid obesity. LSG was invented as a bridging procedure of a two-stage surgery for patients with body mass index (BMI) over 50 kg/m², or superobese patients. However, the technical simplicity of LSG and its surgical outcomes that are comparable to more complex surgeries have increased interest in its efficiency as a stand-alone procedure for superobese patients. In our knowledge, long-term outcomes of LSG in superobese patients have not been analyzed in comparison to other bariatric techniques. The aim

of this study is to compare 3-year results of LSG and laparoscopic Roux-en-Y gastric bypass (LRYGB) with a large sample size and evaluate LSG as a stand-alone bariatric procedure for superobese patients.

Method: The 3-year outcomes of 607 superobese patients who underwent either LSG or LRYGB at Cleveland Clinic Florida during the period of December 2003 and February 2012 were retrospectively reviewed. Patients who underwent each surgery were compared of pre-operative characteristics, weight loss, and comorbidity remission. Univariate analyses compared 6-month, 12-month, 18-month, 24-month, and 36-month results including percent excess weight loss (%EWL) and BMI change. Of the patients whose electronic records indicated pre-operative type 2 diabetes mellitus (T2DM), those with baseline HbA1c of 6% or above were selected for the analysis of HbA1c level at 6, 12, 18, and 24 months after surgery. Those whose HbA1c dropped below 6% were defined as resolved, and those whose HbA1c level decreased from their pre-operative HbA1c were defined as improved. Additionally, the maximum follow-up duration of the study population was analyzed in order to find an explanation for the higher patient attrition rate observed in the LSG group.

Results: Five hundred and one patients (337 female, 164 male) underwent LRYGB and one hundred and six patients (47 female, 59 male) underwent LSG. Female to male ratios of the patients undergoing LRYGB (67.3%) was significantly higher than LSG (44.3%) with $P < .001$. Baseline average BMI of the LRYGB group (57.7 kg/m²) was significantly greater than the average BMI of the LSG group (55.2 kg/m²) with P value of 0.01. However, other pre-operative characteristics including age, race distribution, initial weight, height, excess body weight, and comorbidity did not differ at significance level of 0.05. The average %EWL for LRYGB versus LSG showed no significant difference at any follow-up period: 39.1% versus 36.0% at 6 months ($P = .36$), 59.8% versus 59.7% at 12 months ($P = .97$), 63.2% versus 70.3% at 18 months ($P = .39$), 66.4% versus 66.8% at 24 months ($P = .96$), and 57.1% versus 58.9% at 36 months ($P = .87$), respectively. Similarly, the change in average BMI in the two groups did not differ with any statistical significance over the 3-year follow-up: 44.2 kg/m² versus 45.9 kg/m² at 6 months ($P = .16$), 37.4 kg/m² versus 38.4 kg/m² at 12 months ($P = .53$), 36.1 kg/m² versus 38.8 kg/m² at 18 months ($P = .31$), 34.1 kg/m² versus 35.3 kg/m² at 24 months ($P = .72$), and 36.0 kg/m² versus 39.6 kg/m² at 36 months ($P = .27$), respectively. Of the patients with pre-

operative type 2 diabetes mellitus (T2DM), all of those whose data were available for follow-up achieved remission in both LRYGB and LSG groups at 24 months. In addition, there was no significant difference in mean HbA1c level between the groups at all follow-up periods. There was a dramatic loss of patient data beginning at 12-month follow-up: 192 out of 501 patients (38.32%) in LRYGB and 28 out of 106 patients (26.42%) in LSG were available with follow-up data. In the analysis of the maximum follow-up duration, two factors were shown to be related with follow-up duration - sex and surgery type. However, the univariate analysis of variance revealed that sex does not have statistically significant effect on follow-up duration while surgery type correlated with maximum follow-up at 0.133 with P value of 0.001.

Conclusion: Based on our 3-year comparative analysis of LSG and LRYGB with a large sample size, LSG is an effective stand-alone bariatric procedure for patients with BMI \geq 50 kg/m². Also, our study is first to suggest that LSG is associated with shorter duration of post-operative follow-up, when compared with LRYGB.

A5248

Initiation of early feeding in sleeve gastrectomy patients: prospective observational single institution study

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Objective: Enhanced recovery protocols and fast-track pathways have been gaining popularity in bariatric surgery. However, little information is available regarding the optimal time to initiate post-operative feeds. The objective of this study was to compare the length of stay (LOS) and 30-day re-admission rates for laparoscopic sleeve gastrectomy (LSG) patients starting liquid diet immediately post-operatively and for those starting on the first post-operative day.

Methods: All LSG cases, excluding those done as revisions, performed by four private-practice bariatric surgeons at our institution between January 4, 2016, and April 15, 2016, were prospectively followed. Two of these surgeons had already adopted an early feeding (EF) protocol, whereby

patients were allowed to initiate clear liquid feeds on post-operative day 0, immediately following surgery. The other two surgeons followed a late feeding (LF) protocol, whereby patients were started on a clear liquid diet only on post-operative day 1. All surgeons used similar operative techniques, including port placement, bougie size, type of stapler, and choice of energy device. Otherwise, all patients had very similar pre-operative and post-operative care, as per the private-practice and institutional protocols.

Results: A total of 132 patients underwent LSG during the period of review, 58 were given early feeds and 74 late. In the EF group, 79% were female, mean age was 43.3, and mean BMI was 46. Hiatal hernia repair was performed in 31% of the EF patients. EF patients had an average LOS of 35 hours and 59 minutes with a 10.34% 30-day re-admission rate. In the LF group, 62% were female, mean age was 40.2, and mean BMI was 46.2. Hiatal hernia repair was performed in 27% of the LF patients. LF patients had an average LOS of 34 hours and 58 minutes with a 4.05% 30-day re-admission rate.

Conclusion: Review of our preliminary results suggest that, for patients undergoing primary LSG, early post-operative initiation of feeds may be associated with a higher 30-day re-admission rate.

A5249

Laparoscopic sleeve gastrectomy: Does Bougie size influence 1 Year %EWL? A comparison between 40 and 36 french bougie size. Garber S, Holover S, Angstadt J, Sommer E, Sekhar N, Chiao W
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Background: When performing sleeve gastrectomy in our practice a bougie (36 or 40 French) is used. The authors analyzed the one year excess weight loss(%EWL) for patients whose surgeons had used the 36 bougie, vs %EWL at one year for patients who had the 40 bougie used during their surgery. In our practice of 6 surgeons, 3 use the 40 bougie and 3 use the 36 french bougie. The surgical technique is nearly identical except for preferred bougie size.

Methods: We retrospectively reviewed the data from all patients who had undergone LSG by our surgeons between 2014 and 2016. The data analyzed included bougie size, and %EWL.

Results: 267 patients had %EWL data at 1 year after surgery. 159 surgeries were performed with a 40

bougie. Mean %EWL in this group was 50% 108 patients had a 36 french bougie used during their surgeries. Mean %EWL in this group was 59%.

Conclusion: In the authors' surgical practice a similar technique is used by all surgeons for the sleeve gastrectomies. Despite these similarities the %EWL was lower in the 40 bougie group vs the 36 french group at the one year mark. Though previous studies have demonstrated minimal differences in weight loss between surgeons in a single institution using different bougie sizes, our analysis shows a significant difference.

A5250

THE EFFECT OF CALIBRATION DEVICE CHOICE ON SLEEVE GASTRECTOMY POUCH CREATION AND SUBSEQUENT WEIGHT LOSS

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Background: Controversy exists amongst expert sleeve gastrectomy surgeons on the ideal technique for the creation of gastric pouch. There are many technical variations on the creation of a gastric sleeve including the type of calibration device used, use of varying sizes of bougie dilators, or employing a gastroscopie as a bougie. This study investigates compares two technical variations to the gastric sleeve creation (bougie dilator vs. gastroscopie as bougie) to determine if an appreciable difference in excess body weight loss occurs.

Methods: We performed a retrospective chart review of the first 100 patients who underwent a laparoscopic or robotic sleeve gastrectomy from March 2010 to August 2014. The techniques used for the creation of the gastric sleeve were examined. Teleflex Maloney esophageal dilator bougie that ranged in size from 36F to 42F and video gastroscopie with an 11mm diameter/33F were the calibration devices used in all but 2 of the cases, in which the Visigi-3D 40F calibration device was utilized. Each patient's pre-operative weight, BMI, ideal body weight (IBW) and excess body weight (EBW) were examined prior to operation. Each patient's excess weight loss percentage (EWL%) were recorded during follow-up clinic visits at 1 month, 3 month, 6 month, 1 year intervals.

Results: The Maloney bougie dilator was used in 73 patients and the gastroscopie + Visigi as a bougie / calibration was used in 27 patients. The average pre-operative BMI for the Maloney dilator and gastroscopie groups were 42.6kg/m² and 41.4kg/m²,

respectively. Average EWL% with the Maloney dilator was 19%, 30%, 36% and 38% at 1 month, 3 months, 6 months and 1 year respectively. Average EWL% with the gastroscopie as a bougie was 19.1%, 33.6%, 44% and 59% at 1 month, 3 months, 6 months and 1 year respectively.

Conclusions: There is an appreciable difference in excess body weight loss percentage in patients whom had gastric sleeves created via the gastroscopie as a bougie at 6 months and 1-year intervals compared to the utilization of an esophageal dilator as a bougie. These findings may have been due to the suction component of the gastroscopie, as well as the uniform diameter and its blunt end versus a tapered Maloney bougie dilator, which allows for a more precise sleeve creation by improving visualization and contour of the gastric sleeve. Future studies will focus on increasing the number of endoscopic bougie cases and follow both patient groups at 2 year and 3 year intervals.

A5251

PATHOLOGICAL REVIEW OF 789 CONSECUTIVE LAPAROSCOPIC SLEEVE GASTRECTOMY SPECIMENS: SHOULD WE BE SCREENING FOR OCCULT DISEASE?

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Background: Since the ASMBS position statement in 2012 accepting the sleeve gastrectomy as a primary bariatric surgery procedure, the number of sleeve gastrectomies performed worldwide has increased significantly. However, there is still controversy surrounding the need for routine preoperative endoscopy and post-operative management of specimen pathology.

Method: We performed a retrospective analysis of 789 laparoscopic sleeve gastrectomy specimens from July 2011 to December 2015 at University of Rochester.

Results: We performed 789 Sleeve gastrectomies (24.5%) out of 3211 primary bariatric surgeries during the study period. Mean age of patients was 47.43 with 624 females (79.1%). Average BMI of patients was 44.2. No routine preoperative endoscopies were done. Pathological review of gastrectomy specimens were classified into: normal stomach (589= 74.6%; 488 benign stomach and 101 with focal lymphoid aggregates), Malignancy (17= 2.1%), Gastritis (71= 8.9%), Polyps (108= 13.7%) and Miscellaneous (3= 0.4%). In the malignancy

subgroup, 2 patients had carcinoids (0.25%), 1 submucosal leiomyoma (0.12%) and 14 gastrointestinal stromal tumors (1.7%). In the gastritis subgroup 56 patients had chronic gastritis (7.1%), 9 H-pylori gastritis (1.1%), 5 chronic gastritis with intestinal metaplasia (0.6%) and 1 iron-pill gastritis (0.12%). In patients with GIST, the average tumor size was 0.56 cm with mean number of lesions at 1.07. All GISTs were T1NX with 13 patients with <5 mitosis/HPF and 1 with >5 mitosis/HPF. Ten out of 14 GIST pathologies reported negative margins. There was no correlation between age ($p=0.06$), gender ($p=0.51$) or BMI ($p=0.29$) with incidence of GISTs.

Conclusion: Review of pathology specimens after sleeve gastrectomy proved interesting. A minority of specimens showed abnormal findings such as benign polyps, gastritis, GIST and carcinoid tumors. All malignancies found in pathological examination were small and low grade. Our study showed that the use of routine preoperative endoscopy to screen for occult lesions or gastritis would not have altered postoperative management.

A5252

The Value of Preoperative and Postoperative Histopathological Analysis in Patients Undergoing Laparoscopic Sleeve Gastrectomy

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Introduction: Laparoscopic Sleeve Gastrectomy has been the most commonly performed bariatric procedure in the United States since 2012 [1]. The majority of the stomach is excised during the operation, and is frequently sent for routine histopathological analysis following the surgery. Prior studies have recommended routinely evaluating histopathology of these specimens. The purpose of our study was to determine how frequently this practice results in change in clinical management via the detection of unexpected pathology necessitating further intervention, particularly when combined with preoperative esophagogastroduodenography (EGD).

Methods: We performed a single center retrospective review of all resected gastric specimens following sleeve gastrectomy from 11/23/2010 until 3/22/2016. Total patients included

in the analysis (n) were 470. No patients were excluded from analysis. Pathology reports were collected and results quantified. Proportions of findings were quantified and confidence intervals determined via binomial exact distribution. Baseline data collected for each corresponding patient included age, sex, BMI, surgeon, pathologist, and preoperative EGD results.

Results: Patients included in the population were 23.1% male and 76.2% female, with a mean age of 44.1 years old. All surgeries were performed at a single academic hospital. 95% of patients had a preoperative esophagogastroduodenoscopy (EGD) performed. Of the 470 specimens analyzed, none contained cancer and 1 (0.2%) contained dysplasia. 66.0% of all specimens (95% CI 61.4, 70.2) contained no noted pathology. The most commonly noted pathological findings included chronic gastritis (20.6%, 95% CI 17.0,24.6) and benign or hyperplastic polyp (9.6%, 95% CI 7.1,12.6). 2 patients (0.4%) were noted to have H. Pylori (only 1 patient with previously undetected H.Pylori) requiring postoperative eradication.

Conclusions: Our study detected an extremely low incidence of unexpected histopathological findings in the resected gastric specimen requiring a change in clinical management. We conclude that if EGD is performed as part of the preoperative assessment, routine pathological evaluation of these specimens is of low clinical yield and not necessary. Reference: - Nguyen NT, Nguyen B , Gebhart A, Hohmann S. Changes in the makeup of bariatric surgery: a national increase in use of laparoscopic sleeve gastrectomy. *JAmCollSurg*2013;216(2):252-7."

A5253

Impact of vertical sleeve gastrectomy on patients with preoperative gastroesophageal reflux disease

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Introduction: It remains controversial whether laparoscopic vertical sleeve gastrectomy (LSG) should be done in morbidly obese patients with preexisting gastroesophageal reflux disease (GERD) due to the concern for worsening symptoms after surgery. We hypothesized that LSG can be done safely in these patients and will often lead to symptom improvement.

Methods: We queried a prospectively maintained database of all patients who had LSG at Tufts Medical Center from October 1, 2012 to June 30, 2015 and selected out those patients who carried a diagnosis of GERD prior to surgery. We conducted a survey of these patients to evaluate their preoperative and postoperative frequency and severity of symptoms and medication requirements. All surgeries were performed laparoscopically by two full-time staff surgeons using identical techniques. Creation of the gastric sleeve was done using a 36F bougie starting 4cm proximal to the pylorus and extended to the GE junction taking care not to leave any excess proximal stomach remaining. All patients noted to have a hiatal hernia preoperatively or at the time of surgery underwent repair at the time of LSG.

Results: Of 103 patients who received the survey, 60 responded (58%). The patients were 73.3% female, with an average age at follow up 48.7 years (20 - 77 years). Mean initial BMI of the cohort was 44.6 (34.3 - 62.1). The average decrease in BMI after surgery was 11.9 (1.0 - 29.2). The average percentage of total weight loss was 26.3% (2.8% - 50.6%). The average percent excess BMI loss was 62.73% (9.9% - 138.3%). The average percentage of excess weight loss was 62.8% (9.8% - 137.9%). The average time since surgery to survey completion was 20 months (range 10 - 39 months). 90% of these patients had a concurrent hiatal hernia repair performed at the time of LSG. A statistically significant improvement was found in self-reported GERD symptom frequency after LSG ($p=0.0002$). Objective improvement in GERD after LSG was defined by a decrease in the total number of GERD medications taken and was also found to significantly improve ($p<0.001$). Subjective complete resolution of GERD as defined by absence of symptoms and no medication use after LSG occurred in 32.0% of all patients studied. Subjective complete resolution of GERD was significantly more likely after 24 months from surgery ($p=0.003$). None of the outcomes tested were significantly associated with gender or preoperative comorbidities including diabetes mellitus, COPD or smoking status. GERD symptom improvement after LSG was noted to occur at greater frequency in lower preoperative BMI groups (Initial BMI 30-39.9 vs. 40-49.9 and 50+) for all parameters assessed although this did not reach statistical significance.

Conclusion: Our results suggest that it is safe to perform LSG in patients with preexisting GERD. We have found that in short-term follow up (<3 years)

the majority of patients have improvements in GERD symptom frequency, severity and decreased medication requirements after LSG. In this cohort of patients we found a statistically significant decrease in number of GERD medications taken after LSG ($p<0.0001$) and a significant decrease in self-reported symptom frequency ($p=0.0002$).

A5254

Sleeve Gastrectomy in a Free Standing Ambulatory Surgical Center

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Background: Sleeve gastrectomy (SG) is currently the most widely performed procedure for the treatment of morbid obesity. SG leads to significant weight loss as well as a reduction in weight related comorbidities. Procedures performed in ambulatory surgical centers (ASC) can provide several advantages over hospital-based surgery. We present our results of 1036 consecutive patients who underwent SG in an ASC.

Objective: Assess the safety and efficacy of outpatient SG in a freestanding ASC.

Setting: Free Standing ASC, Eviva Bariatrics, Seattle WA

Methods: Data was collected retrospectively for all patients who underwent SG from Jan 1st 2013 - Dec. 31st 2015, $n=1,036$. Revisional procedures were excluded from this study. Patients were excluded from the ASC if they weighed >450 pounds, if anticipated surgery time was > 2 hours, if the patient had impaired mobility limiting early ambulation, or if there were medical problems requiring postoperative monitoring beyond 23 hours. All patients were enrolled in a comprehensive aftercare program.

Results: Mean age was 46 years (range 18-73), mean preoperative body mass index (BMI) was 41.7 (28.2-62.8). Mean operative time was 61(-176 minutes. Concomitant hiatal hernia repairs were performed on half the patients. Eighteen patients (1.73%) were readmitted within 30 days. 12 patients (1.16%) were transferred from the ASC to a nearby hospital. Ten patients (1.04%) had a re-operation within 30 days. There were 6 staple line leaks (0.58%). There were no open conversions and no deaths within 30 days. SG patients lost on average

55.26% at six months of their excess body weight (EWL) and 69.71% EWL at 12 months.

Conclusion: With experienced surgeons, appropriate protocols, and a consistent operative team, SG can be performed safely in a freestanding ASC. ASCs need to carefully consider these principles before implementing this type of program.

A5255

Predictors of Post-Operative Bleeding after Laparoscopic Sleeve Gastrectomy

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Introduction: Post-operative bleeding after a laparoscopic sleeve gastrectomy (LSG) is a morbid complication, resulting in increased hospital length of stay, transfusion and reoperation. Techniques to decrease the rate of post-operative hemorrhage, including the use of staple line reinforcement and fibrin sealant, are costly and have not been shown to decrease this risk. We reviewed our inception series of LSG patients with the aim to identify risk factors associated with post-operative bleeding.

Methods: All patients who underwent LSG at University of Massachusetts Medical Center between January 2013 and February 2015 were recorded into a database (n=633). Post-operative bleed was defined as hematocrit drop requiring transfusion, extended post-operative stay or return to operating room to control bleeding.

Results: Out of 633 patients, 47 (7.4%) patients met our criteria for post-operative bleed. Median length of stay in patients with post-operative bleed was 3 days (vs 1 day in patients without bleeding, p<0.001). On univariate analysis, increased age (median age 52 vs 46, p=0.046), lower BMI (40.9 vs 43.6, p=0.02), pre-operative enoxaparin (91.2% vs 75.7%, p=0.038), and bougie size of less than 34 French (57.8% vs 31.4%, p<0.001) was associated with increase post-operative bleed. Use of seamguard (79.8% vs 57.5%, p<0.001) and fibrin sealant (46.5% vs 31.9%, p=0.053) was associated with decrease post-operative bleed. On multivariate analysis, BMI (OR 0.92, 95% CI 0.856-0.979, p=0.010) was inversely correlated with lower incidence of postoperative bleeding, whereas the use of pre-operative enoxaparin (OR 3.55, 95% CI 1.054 -

11.944, p=0.041) was an independent predictor of increase post-operative bleeding.

Conclusion: Patients with lower BMI and those who received pre-operative enoxaparin are at increased risk for clinically significant hemorrhage after LSG. Use of staple line reinforcement and fibrin sealants do not impact the incidence of postoperative hemorrhage. Caution should be exercised when administering chemical deep vein thrombosis prophylaxis in this population. These findings offer opportunities for decreasing the incidence of hemorrhage after LSG.

A5256

Gallstone disease after laparoscopic sleeve gastrectomy in an Asian population - What proportion of gallstones actually become symptomatic?

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Introduction: Despite current evidence on gallstone disease after laparoscopic sleeve gastrectomy (LSG) there is an existing lack of consensus on practice guidelines such as surveillance and stone-lowering prophylaxis usage. Furthermore the available evidence also has a racial bias as western reports predominate data on LSG. Considering the growing popularity of this procedure in Asian countries and the differing anthropometrics of these subjects, we have attempted to look at the epidemiology of this complication in a solely Asian subgroup by analyzing our local LSG database to define the incidence of gallstone disease following this procedure

Methods: A retrospective review of a prospectively maintained database of 102 morbidly obese patients treated with LSG between Dec 2008 and Nov 2014 was conducted. Abdominal ultrasound for gallstone screening was conducted preoperatively and at 12-month postop. No gallstone lowering prophylaxis was used. Primary outcome measure was the incidence of new gallstone formation on 1-year surveillance ultrasounds and the rate of symptomatic stones during the follow-up period.

Results: 102 patients were included in the study. The cohort comprised of 43 (42%) Malays, 33 (32%) Chinese, 20 (19.6%) Indians and 6 (5.8%) from other ethnic groups. Mean age was 43 years (range 20-68) with average initial BMI of 41.68 kg/m² (SD 6.51

kg/m²). Preoperative gallstones were present in 14 (13.7%) cases. At 12-month post surgery 24 (23.5%) patients with no previous gallstone disease developed new onset stones. Within the mean follow-up period of 28.4 months (range 12-48), only one case (0.9%) developed gallstone complication and required a cholecystectomy. Upon comparing patients with new onset gallstone and those without stones, we found no statistical difference in age, gender, BMI variables (initial BMI, ΔBMI at 6-months and 1-year), co-morbidities (DM and HLD) and fatty liver status between the two groups.

Conclusion: Our results match existing western data in that gallstone formation is common after LSG though the rates of stone related complication is relatively small. This is despite not using gallstone-lowering prophylaxis. The low conversion rate also questions the clinical relevance of surveillance screening, as most patients with new onset gallstones remain symptom free at least in the short-term follow-up

A5257

Management of Leak after Laparoscopic Sleeve Gastrectomy Using OTSC System: A Systematic Review

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Background: Staple line leaks have been reported in up to 2.8% of patients after laparoscopic sleeve gastrectomy (LSG). Recently, endoscopic management with over-the-scope-clips (OTSC) has received much attention in bariatric surgery. The aim of this study is to review the utility of OTSC system in endoscopic management of leaks after LSG.

Methods: MEDLINE/PubMed was systematically searched for articles on endoscopic management of leaks after LSG using the OTSC system.

Results: A total of 16 papers were identified in the initial search of which 7 articles met our eligibility criteria and were included. The final analysis incorporated 162 LSG patients with leak. Patient age varied between 18 and 67 years. Time interval from LSG to leak ranged from 1 day to 803 days. Fever, abdominal pain, and tachycardia were the most common presentations. Sixty one percent of leaks were < 10 mm and 39% were > 10 mm in size. These leaks were mainly located at the proximal staple line and gastroesophageal junction. Fistula development

was reported in 2 patients (1.2%) out of 162 leaks. Endoscopic clipping using OTSC system was performed between 0 to 271 days after leak/fistula development. In 44 patients, only 1 clip was used. The remaining patients (116 patients) required >= 1 clip for closure of the leak. The OTSCs were between 9 to 11 mm in size. The most common OTSC system used was type T (pointed teeth), which improves tissue capture and decreases the risk of clip slippage in indurated or fibrotic tissue after leak/fistula closure. Additional procedures were reported to be done in 19 patients as follows: 16 (84%) stents and 3 (16%) glue. Of these, stent migration and ulcers related to the stent impaction were the most common complications. Patients were followed between 1 week and 8 months, after leak management, by either control endoscopy or assessment of the food tolerance. No recurrence of leak/fistula was noted. Success rate for endoscopic OTSC system was reported between 79 and 100%. There were 3 deaths cited after leak management which were unrelated to the endoscopic OTSC.

Conclusion: OTSC system is a promising endoscopic approach for management of leaks following LSG. The system currently holds a high success rate in management of LSG-related leaks or fistulas. The technique is evolving and further well-designed studies are required to warrant its efficacy and safety compared to the available options.

A5258

Comparison of Two Specimen Retrieval Techniques in Laparoscopic Sleeve Gastrectomy: Is Endobag Necessary?

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Background: Laparoscopic sleeve gastrectomy (LSG) has become a popular stand-alone treatment for morbid obesity. However, removal of the gastric specimen could be a challenging maneuver.

Objectives: We aimed to compare a simplified retrieval technique for extraction of the gastric specimen without endobag with conventionally performed specimen retrieval using endobag.

Methods: A case-control study was conducted recruiting patients undergoing LSG. Patient's demographics, preoperative characteristics, intra-operative and postoperative variables were

compared between two groups according to the technique of gastric specimen removal.

Results: A total of 193 patients (60.6% female) were enrolled into case (n=100) and control groups (n=93). Mean±SD age and BMI of patients were 35.64±11.84 years and 47.28±8.22 Kg/m², respectively with no significant difference between groups. Median (25th, 75th inter-quartile) OR time in non-endobag group was significantly shorter than that of endobag group (60 [50-85] mins vs. 70 [60-90] mins, p<0.0001). Patients of both groups had similar intra-operative and trocar site complications (hernia and wound infection) (4% for endobag and 4.4% for non-endobag group). The median (25%-75% [IQR]) LOS was also comparable between endobag and non-endobag patients (3[2-3] days vs. 3[2-4] days, p=0.84). Additionally, there was no statistically significant difference between the two groups for weight loss outcome (p>0.05).

Conclusion: Non-endobag technique is safe and feasible in gastric specimen retrieval with substantial saving in OR time and cost and comparable outcomes with endobag removal technique.

A5259

Intra-thoracic sleeve migration: An Underreported Complication after Laparoscopic Sleeve Gastrectomy

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Background: Intra-thoracic staple-line migration (ISM) is an underreported complication after laparoscopic sleeve gastrectomy (LSG). Herein, we report our experience with such a rare event.

Methods: Between January 2016 and April 2016, patients undergoing LSG for morbid obesity were screened for ISM development. Demographics, clinical presentations, and imaging findings were analyzed for patients with confirmed ISM diagnosis.

Results: A total of 10 patients (9 females, 1 male) with a mean ± SD age and body mass index of 40.6±10.35 years and 45.08±9.15 kg/m², respectively, were included. Nine patients (90%)

underwent primary LSG while 1 patient underwent laparoscopic band removal and conversion to LSG. Six patients (60%) underwent concomitant hiatal hernia repair in addition to the LSG. Only 1 patient (10%) had a history of a previous abdominoplasty. Four patients (40%) had gastroesophageal reflux disease (GERD) before LSG and 9 patients (90%) had GERD after LSG with 5 patients (50%) developing de novo GERD. Post-LSG cough and vomiting were present in 3 (30%) and 4 (40%) patients respectively. Time from LSG to ISM diagnosis ranged from 1 day to 38 months. Regarding the presentation, GERD was noted in 8 patients (80%), epigastric pain in 4 patients (40%), constipation in 3 patients (30%), weight regain in 2 patients (20%), dysphagia in 1 patient (10%), and regurgitation in 1 patient (10%). Computerized tomography (CT) scanning confirmed ISM diagnosis and showed moderate size hiatal hernia in 6 patients (60%), dilated proximal portion of the stomach in 3 patients (3%), and large hiatal hernia in 1 patient (10%). At the time of this study, only 2 patients have undergone sleeve reduction and hiatal hernia repair with uneventful follow-up. Outcome of the remaining patients will be reported once available.

Conclusion: Concomitant hiatal hernia repair at the time of sleeve gastrectomy accounts a major risk factor for the occurrence of ISM after LSG. ISM should be included in the differential diagnosis of patients presenting with post-LSG GERD. CT scan is the modality of choice to accurately diagnose the condition. Surgeons should identify high-risk patients for development of post-LSG ISM to avoid aggressive dissection during mobilization and attempt to perform prophylactic gastric fixation.

A5260

PROGNOSTIC FACTORS FOR WEIGHT LOSS AFTER SLEEVE GASTRECTOMY, THE WAY TO SELECTIVE INDICATION

Background: Sleeve gastrectomy (SG) was created as a step surgery for duodenal switch or Roux-n-Y gastric bypass in high risk patients. As time goes by, the preliminary good results widened its indications, and nowadays this is the most performed bariatric procedure in most of the countries worldwide. Some teams have adopted it as the first choice to all their patients. Here we evaluate the prognostic factors related to better weight loss after sleeve gastrectomy in order to make better choices.

Methods: We retrospectively evaluated our patients operated for SG with at least 2 years of follow-up.

We excluded patients converted from other previous procedure. We adopted the Reinhold criteria to define good or bad weight loss after surgery. The prognostic factors were evaluated by multivariate analysis.

Results: We evaluated 222 patients, 140 women (63.07%) with a mean age of 44.08+-10.5 years old, and an average BMI 51.12+-9.65kg/m² at the time of the surgery. Weight loss was 67.56, 68.63%, 62.48%, 63.72%, 67.96% and 63.24% of excess BMI loss at every year after surgery. Morbidity rate was 5.8% (15 patients). We did not have any Hiss leak nor mortality in our series. Globally, 23.5% of the patients had failure of weight loss. Around 40% of the patients had any weight regain, and this was significant (>10% of nadir weight) in 10-20% depending on the time after surgery. Multivariate analysis found that aged and initial BMI were the most common predictive factors at every year of follow-up. Younger patients and those with BMI below 40kg/m² had better chances of success.

Conclusions: SG had good weight loss results in our series. Weight loss failure and weight regain were only found in less than 25% of the patients. Age and initial BMI were the prognostic factors to better weight loss. Adequate selection previous to surgery may improve results and avoid failures and revisional surgeries.

A5261

A Randomized Trial Comparing Reflux Symptoms in Sleeve Gastrectomy Patients with or without Hiatal Hernia Repair

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Background: The effect of the laparoscopic sleeve gastrectomy (SG) on reflux symptoms is unclear. Many surgeons only offer SG to patients with minor or no reflux symptoms, fearing that their reflux will worsen. Many will also advocate the need for crural repair at the time of SG to prevent de novo or worsening reflux symptoms. All the while, this is done without suitable data to make such conclusions.

Objective: To compare the effects of SG on reflux symptoms and to determine if a crural repair has any substantial effect on the outcome using high-quality randomized data to draw conclusions.

Setting: University of Texas Health Sciences Center in Houston

Methods: The Gastrointestinal Symptom Rating Scale (GSRS) was determined in 100 consecutive, preoperative SG who were then randomized into a crural repair group or non-repair group. They were subsequently followed up every three months for one year. We compared their demographics, body mass index (BMI), weight loss, presence and size of hiatal hernia, and GSRS for 12 months, comparing the groups' reflux symptoms.

Results: We had 78% follow-up at a year and showed that there was a significant decrease in the GSRS within groups (P<0.001); however, there was no difference between the groups (p=0.35). Age, starting BMI, percent excessive weight loss (%EWL), nor hiatal hernia size correlated with change in the GSRS score. The only variable that did impact outcome was the preoperative GSRS. At 12 month, 34% of patients with a preoperative GSRS less than the median score of the population had worsening of their symptoms compared to only 2% of patients who had preoperative GSRS greater than the median. Overall, 19% had worsening reflux (5% de novo), 14% had no change, and a 66% reported an improvement in their symptoms.

Conclusions: These data suggest that a crural repair at the time of SG does not significantly reduce reflux symptoms compared to SG alone. Preoperative patients with significant reflux symptoms have a more significant improvement in their symptoms after surgery compared to those patients who do not report significant reflux symptoms. The high incidence of reflux after SG observed in the current literature may be a result of this specific patient subpopulation that receives a SG because of surgeon bias and not an inherent property of the SG itself or the presence of a hiatal hernia.

A5262

Diabetes Status, Preoperative HbA1c Level, and Infectious Complications after Primary Sleeve Gastrectomy

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Background: Type 2 diabetes mellitus (T2DM) is a known risk factor for infectious outcomes after various surgical procedures due to impaired immune function during periods of hyperglycemia. Hemoglobin A1c (HbA1c) is a reliable marker for

blood glucose level averaged over the prior three month period. A study on post-surgical outcomes of patients undergoing noncardiac surgery showed preoperative HbA1c >8% to be associated with longer hospital stay. Imperfect preoperative glycemic control prior to weight loss surgery (WLS) has been associated with higher postoperative glucose level, lower weight loss, and fewer diabetic remissions. To minimize postoperative complications in WLS, a guideline from the American Society for Metabolic and Bariatric Surgery states that preoperative glycemic control with HbA1c of 6.5-7% or less 'may' improve outcomes. Many WLS programs recommend a preoperative HbA1c lower than 8%, but evidence for this has not been extensively explored in laparoscopic sleeve gastrectomy (LSG) patients.

Methods: After IRB approval we performed a retrospective review of all patients age 18 undergoing primary LSG at a university WLS program from June 2008 through December 2014.

Nondiabetic patients as well as diabetic patients with a preoperative HbA1c measured within 6 months of date of surgery (DOS) were included in the study. HbA1c was noted at the start of our six month multidisciplinary program and for patients following dietary recommendations and not gaining weight, it was not repeated. As such, we had few levels within 3 months of surgery. Information was collected on preoperative age, sex, body mass index (BMI), HbA1c, all hypoglycemic agents, as well as all infectious complications within 30 days of surgery. Three fellowship-trained academic surgeons used an identical surgical technique, including a single dose of preoperative antibiotics, starting the staple line 6cm from the pylorus, and using a gastroscope approximating a 36Fr bougie for both sizing and a pneumatic leak test.

Results: 346 patients had LSG during this time period, among whom 34.9% carried a preoperative diagnosis of T2DM, and 65.1% did not. 101 were non-diabetic with no HbA1c drawn, and 131 patients had HbA1c drawn within six months of DOS. 114 patients with HbA1c more than 6 months prior to DOS were excluded. Of 232 included patients there were 173 females (74.6%) and 59 males (25.4%). The mean BMI and age were 49.9 and 45.5, respectively. Patients were subdivided into four groups: non-diabetics [group 1, N=151], and three diabetic groups including HbA1c < 6.5 [group 2, N=20], HbA1c 6.5 - 8 [group 3, N=49], and HbA1c > 8 [group 4, N=12, range 8.1-10]. The mean age of the diabetic group was 50.2, with the non-diabetic group 43.2

($p < 0.01$). There was no significant difference in BMI between groups ($p = 0.07$). A total of 20 infections were identified in 18 patients (8.6%), including 4 early leaks, 5 urinary tract infections, 7 superficial wound infections, 2 hospital acquired pneumonias, and 1 case of bacteremia. The leaks occurred in patients #9, 10, 18 and 26 in the series and no further leaks have been seen subsequently, including in years 2015-16, which were not included in the analysis. We believe these early leaks to have been related to a learning curve effect. The non-diabetic group had an infection rate of 7%, slightly lower than that in the overall diabetic group, 10%, but not statistically different. Within the three diabetic groups, we saw infection rates of 5, 12, and 8% respectively. Chi-square test showed no significant difference between the four groups in terms of postoperative infection rate ($p = 0.60$). While not statistically significant, it was interesting to note that the patients with the best-controlled T2DM fared better than the patients without T2DM.

Conclusions: In our study of the first six years of LSG in our program, we detected an early postoperative infection rate of 8.6%, consistent with early results from other publications. We found no significant difference in infection rates between patients with or without T2DM, nor did we find any differences in such rates depending on how well preoperative glycemic status was controlled. We would likely need to study this with a larger sample size to confirm similarity between groups. If so, it might signify that preoperative HbA1c status may not need to be as vigorously controlled for LSG patients, thus potentially improving access to care and program progress for patients with diabetes that is more difficult to control.

A5263

Outcomes of hiatal hernia repair during bariatric surgery – A single institution experience

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Introduction: Hiatal hernia (HH) is a common occurrence in bariatric patients, with studies showing up to 50% incidence. No agreement exists on the need for hiatal defect closure during a bariatric surgery. The purpose of this study is to evaluate the incidence of hiatal hernia in our

bariatric population and to analyze whether concurrent defect repair creates differences in outcomes after bariatric procedures.

Methods: From our total population of bariatric surgeries done between 2010 and 2014 we identified patients who were diagnosed with hiatal hernia and divide them in 2 groups: repaired or not repaired. Data collected included baseline demographics, perioperative parameters, and postoperative outcomes. BMI was obtained in follow-up consults to up to three years.

Results: From our population of 1129 patients that underwent a bariatric surgery, a total of 150 (13.2%) patients were diagnosed with a hiatal hernia. Females (73%) represented the majority of our population (110 vs. 40). The most common race was Caucasian 68% (N=102) followed by Hispanics 15% (N=23) and African Americans 14% (N=22). Diagnosis of the HH was primarily made by an Esophagogastroduodenoscopy (EGD) 58% (N=87), Gastrografin study 2% (N=4), Esophageal manometry <1% (N=1) or intraoperatively in 39% (N=59) of the cases. Patients underwent either a laparoscopic sleeve gastrectomy 52% (N=78), laparoscopic roux en y gastric bypass 24% (N=36), revision 21% (N=32) or Gastric banding 3% (N=4). Of the total population diagnosed with a HH, 56% were repaired (Group 1, N=85) and 44% were not repaired (Group 2, N=65). Preoperative BMI was similar in both groups 38.9 in Group 1 and 41.33 Group 2 (P=0.87). The mean age of the HH repaired group was 55.51 years versus 50.02 years in the non-repaired group (P>0.01). Regarding the comorbidities presented before surgery only sleep apnea (P>0.01) and dysphagia (P=0.02) were more present in Group 1; no significant difference was found among hypertension (P=0.51), diabetes mellitus (P=0.22) and GERD (P=0.7). The decision to close the hiatal defect was more common during a revision procedure (p>0.01) compared with primary procedures. No significant difference was found among any particular primary procedure regarding closure or not of a hiatal defect. The mean operative time was significantly higher when the hiatal hernia was fixed: 103 minutes versus 73 minutes (P>0.01). Length of stay was significantly higher in Group 1 (P=0.02) with 3.5 days versus 2.7 days. Readmission rate was 15% (N=13) in Group 1 and 17% (N=11) in Group 2, with no significant difference (P=0.8). Overall postoperative complication rates (<30 days) were also not significantly different between both groups studied (P=0.17), with nausea and vomiting being the most prevalent ones 23% (N=20) of the

Group 1 and 18% (N=12) in the Group 2. Other complications were dehydration (8% in Group 1 vs. 10% Group 2) and diarrhea (11% in Group 1 vs. 8% Group 2). When BMI was studied over time up to 3 years post operatively, no statistically significant difference was found.

Conclusion: Hiatal hernia repaired during a bariatric surgery is safe and does not increase the complication and readmission rates. However, operative time and hospital length of stay could be prolonged; a prospective controlled study is needed to further assess these issues.

A5264

Management of Obesity Among Renal Transplant Candidates: The Role of Sleeve Gastrectomy

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Background: Obesity is a risk factor for end-stage renal disease (ESRD) and affects up to 34% of renal transplant candidates. Among renal transplant recipients, obesity has been associated with an increased risk of surgical site infection, decreased graft survival, and increased mortality. As a result, many transplant programs preclude patients based on body mass index (BMI). At our institution, patients with ESRD are not eligible for renal transplantation if their BMIs are >40 kg/m². Given the challenges these patients face in achieving the weight loss required to become transplant eligible, bariatric surgery represents an attractive option for bridging patients to transplantation.

Specific Aims: This study aims to assess weight/BMI changes and time to renal transplant eligibility among patients with ESRD referred for evaluation of obesity and consideration of sleeve gastrectomy (SG).

Methods: We performed a retrospective review of patients with ESRD referred by our Transplant Center to our Nutrition Clinic for evaluation of obesity and consideration of SG between January 2013 and November 2015. Obesity evaluation included consultation with a nutrition specialist (MD), dietitian, psychologist, and when indicated, a bariatric surgeon. All patients received lifestyle change recommendations and support.

Results: Between January 2013 and November 2015, 24 patients with ESRD were referred and 21 completed obesity evaluation. Of these 21 patients,

10 underwent SG and 11 have not undergone SG to date (NSG). Two of the NSG patients are in the preparation process to undergo SG. The other 9 have not undergone SG for the following reasons: BMI already <40 kg/m² at time of obesity evaluation (N=1), BMI goal achieved with lifestyle modification alone (N=3), BMI goal achieved with liraglutide (N=1), lack of insurance coverage (N=2), and unknown reasons (N=2). In the SG cohort (N=10), there were no deaths or post-operative complications. At the time of bariatric surgery, mean weight was 126.4 kg (range 75.1-205.4) and BMI was 44.4 kg/m² (range 34.9-56.5). One patient was lost to follow up after SG. The other 9 patients achieved a BMI <40 kg/m² after a mean duration of 4 months (range 0-12 months). At the most recent follow-up time point (mean 20 months, range 6-29 months), average weight in the SG cohort was 98.3 kg (range 58-132) and BMI was 34.5 kg/m² (range 26.7-43.7), representing an average excess weight loss (EWL) of 53.6% (range 14.5-93.7%). The 11 patients in the NSG cohort had a mean weight of 126.4 kg (range 97.5-175.2) and BMI of 43.6 kg/m² (range 37.8-52.9) at the initial obesity evaluation. This was not significantly different from baseline values in the SG cohort. Seven of the 11 NSG patients (63.6%) achieved a BMI <40 kg/m² after a mean duration of 6 months (range 0-27 months). At the most recent follow-up time point (mean 15.5 months since obesity evaluation, range 4-31 months), average weight in the entire NSG cohort was 120.7 kg (range 96.5-180.5) and BMI was 41.3 kg/m² (range 32.9-57.9). Average EWL was 12.5% (individual values ranged from 21.3% excess weight gain to 29.0% EWL). In the SG cohort (10), 3 have undergone living donor renal transplantation and 2 are active candidates. Among the remaining 5, reasons for renal transplant deferment include: improvement in renal function after SG (N=1), loss to follow-up (N=2), melanoma diagnosis (N=1), and poor social support in the setting of multiple medical issues (N=1). In the NSG cohort (11), 7 patients became transplant candidates based on BMI criteria and 3 of those have undergone living related donor transplant at an average of 9 months (range 3-19 months) after obesity evaluation. Reasons for delay in transplantation include: lack of living donor (N=3) and awaiting insurance approval (N=1). Four NSG patients are not transplant candidates based on BMI. There were no deaths or peri-operative complications after renal transplantation in either the SG or NSG cohorts. At the time of renal transplantation, the average weights and BMIs were

100.1 kg (range 95.4-104) and 34.5 kg/m² (range 30.6-40), respectively, in the SG cohort, and 107.7 kg (range 97.6-121) and 36.9 kg/m² (range 33-39.2), respectively, in the NSG cohort.

Conclusion: Patients with ESRD who are not deemed renal transplant candidates based on BMI criteria benefit from weight loss interventions. Compared to lifestyle interventions alone (NSG), SG was associated with greater weight loss and a higher chance of achieving a BMI target <40 kg/m² in a shorter time frame. SG was safe with no reported deaths or complications. Several factors other than weight and BMI influence time to renal transplantation and are not addressed in this study. Additional investigation is warranted to assess the impact of SG on renal transplant outcomes such as surgical site infections, graft function, and overall survival.

A5265

Comparison of medial versus lateral approach for laparoscopic sleeve gastrectomy

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Objective: To compare the clinical outcomes of medial versus lateral approach for laparoscopic sleeve gastrectomy (LSG).

Methods: Retrospective analysis of Ontario Bariatric Registry database, comparing two surgeons at a single institution who perform medial and lateral LSG. Surgical complications, operative time, length of stay (LOS) and 30-day mortality were evaluated. Rates of anastomotic leak, hemorrhage, stenosis/stricture, and hospital readmission were also studied at 3 months. Percent total weight loss was calculated at 1 year post-operative. The analysis of continuous and nominal data was performed using the two sample t-test, and Chi-square test, respectively. Regression analysis was also performed.

Results: A total of 411 patients underwent LSG with either a medial (n=164) or lateral (n=247) approach. There was no significant difference in surgical complications (p = 0.818) or mean LOS (p=0.399). Operative time was significantly shorter in the medial group 70 +/- 16 minutes versus 88 +/- 28 minutes in the lateral group (p<0.001). Linear regression analysis demonstrated gender

($p=0.00717$) and operative approach ($p<0.001$) as significant variables affecting OR length. The 30-day mortality in both groups was zero. Rates of complication and hospital readmission at 3 months were not significantly different between groups. Anastomotic leak rates were 0 versus 1.9% ($p = 0.409$) in the lateral and medial group, respectively. Percent total weight loss was not significantly different between groups at 1 year ($p=0.244$).
Conclusion: Rates of complications, LOS, and percent total weight loss at 1 year are not significantly different between medial versus lateral LSG. The medial approach may decrease operative time, this finding warrants further study.

A5266

10-YEARS RESULTS OF SLEEVE GASTRECTOMY AS COMPARED TO ROUX EN Y GASTRIC BYPASS IN PATIENTS WITH MORBID OBESITY A case control study

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Introduction: Bariatric surgery is an effective therapy to induce long-term weight loss and control comorbidities in morbidly obese patients. We have been performing laparoscopic Roux-en-Y Gastric Bypass (RYGB) since 2001. Laparoscopic Sleeve Gastrectomy (SG), introduced in 2004 as a primary bariatric procedure, is currently the most commonly performed bariatric procedure in France. The aim of this study is to evaluate the 10-years results of SG for patients with morbid obesity as compared to RYGB in a case control study.

Methods and Procedures: We performed the first SG as a primary bariatric procedure in February 2004. After the accomplishment of the initial learning curve period, we started enrolling the patients in a prospective database. The aim of this study is to assess the long-term results of SG in patients who completed 10 years follow up. Subsequently, we performed a case control study by matching patients with those who had a RYGB during the same period. Between December 2004 and August 2005, 26 patients had SG, of whom 4 were lost to follow up (15.4 %). During the same study period, 214 patients underwent RYGB of whom 22 were matched according to criteria including, age, sex, body mass index (BMI), and the type of comorbidities. The primary endpoint was the

10-year percentage of excess weight loss (EWL). Secondary endpoints comprised resolution of comorbidities, reoperation for complications, revision, and quality of life (QOL) assessment.

Results: Average 10-years EWL was 48.8 % in the SG group and 61.8 % in the RYGB group ($p<0.05$). Three patients (13.6 %) in the SG group and 5 patients (22.7 %) in the RYGB were reoperated for complications (i.e., cholelithiasis, intestinal obstruction, perforated ulcer, stenosis) ($p<0.05$). In the SG group, 5 patients had revisions for reflux or insufficient weight loss (22.7 %). One patient who had RYGB had revision for weight loss insufficiency (4.5 %) ($p<0.05$). Resolution of comorbidities as well QOL assessment was comparable in both groups ($p>0.05$).

Conclusions: The analysis of the 10-years results in this small case control study shows that SG is associated to significantly less weight loss as compared to the RYGB. However, reoperation for complications is higher after RYGB.

A5267

Bariatric surgery improves quality of life and maintains nutritional status of older patients having chronic obesity

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Introduction: Bariatric surgery is being safely performed in older patients. Quality of life and aggravation of sarcopenic obesity, however, have never been assessed in this subgroup of patients. This retrospective study aims to evaluate quality of life of older obese patients after surgery and to compare variations of their nutritional parameters to those of younger patients.

Methods and Procedures: Seventy-nine patients older than 60 years (Group1) were matched 1:2 with 158 patients younger than 50 years (Group 2) for comparison of nutritional parameters. A modified Impact of Weight on Quality Of Life (IWQOL) questionnaire was filled by all included patients, at the one-year check-up.

Results: The preoperative serum albumin and prealbumin levels were comparable between the two groups. Albumin values regained preoperative levels at six months in both groups intergroup comparison showed no significant difference. The serum prealbumin levels reached back the preoperative values at 12 and 6 months in Groups 1 and 2, respectively. Values were significantly lower in Group 1 comparatively to Group 2 at three and six

months (0.18 versus 0.19; $p=0.04$ and 0.20 versus 0.21; $p=0.03$, respectively) but not at one year. Sixty-nine patients (87.3%) gave a total of 1860 answers in the modified IWQOL. Among them, 181 (9.7%) and 1422 (76.5%) were in favour of mild and marked improvements, respectively.

Conclusions: Bariatric surgery improves quality of life of older obese patients with no compromise of their nutritional status. In the lack of precise recommendations, this represents a major argument that may serve to the preoperative assessment of such patients.

A5268

Efficacy of Fibrin Sealant Application on Postoperative Hemorrhage in Bariatric Surgery

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Background: Fibrin sealants are used as hemostats, sealants and adhesives in surgical practice.

Postoperative bleeding is one of the most common complications of bariatric surgery and commonly due to stapler lines and anastomosis. Hence, we evaluated the hemostatic effect of fibrin sealant application on stapled lines in bariatric surgery.

Materials and Method: From December 2015 to April 2016, a total of 51 bariatric patients who underwent laparoscopic sleeve gastrectomy were included in this study. Patients were divided into two groups according to use of Tisseel Fibrin Sealant on stapler lines. Age, gender, body mass index (kg/m²), operation type, hemoglobin levels (preoperative and postoperative first day), drainage amount on postoperative first day, need of blood transfusion and hospital stay were noted in both groups.

Results: 51 patient were divided into two groups. Group 1 includes 29 patients that Tisseel Fibrin Sealant was used on stapled lines and group 2 includes 22 patients that fibrin sealants were not used. Mean age was 33,8+10,7 and 37,6+12,7 years in group 1 and 2 respectively. There were 6 males and 23 females in group 1 and 4 males and 18 females in group 2. Mean body mass index in group 1 was 45+5,3 where it was 45,2+6,1 in group 2. There was no statistically significant difference between two groups according to age, gender, body mass index ($p>0,05$). Mean preoperative, and postoperative first day hemoglobin values of group 1

were 13,6+-1,5 and 12,7+-1,5 respectively, whereas they were 13,2+-1,4 and 12+-1,9 in group 2 respectively. There was no statistically significant difference between two groups in terms of change in hemoglobin levels ($p>0,05$). Median drainage amounts were 40 cc(10-180) in group 1 and 107,5 cc(20-420) in group 2 on postoperative first day ($p=0,005$). In group 1, there was no patient who requires blood transfusion, whereas 3 patients in group 2 required blood transfusion ($p=0,07$). There were no anastomotic leaks in both groups and none of patients required reoperation. Median hospital stay was 2+-0,25 days in group 1 and 2,8+-1,89 days in group 2 ($p=0,17$).

Conclusions: Bleeding and Anastomotic leaks are most common surgical complications in bariatric operations. Fibrin sealants are in use to maintain avoiding from such complications. There are several reports suggest that application of fibrin sealant may enhance the anastomotic outcomes in gastric bypass surgery and also endoscopic use of fibrin sealants may be beneficial in treating leaks following gastric bypass surgery. In addition, the control of bleeding is the prominent issue that a fibrin sealant may provide its cardinal beneficial effect. In this study, the use of fibrin sealants seems feasible in bariatric surgery to reduce postoperative bleeding and drainage amounts.

A5269

Feasibility of Laparoscopic Sleeve Gastrectomy in patients with Left Ventricular Assist Device.

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Introduction: The use of left ventricular assist device (LVAD) as a bridge to heart transplantation therapy or destination therapy (DT) in patients with end stage heart failure (ESHF) is increasing. Morbid obesity is one of the important factors that preclude these patients candidacy for heart transplantation and also a well-known risk factor for increased cardiovascular morbidity and mortality. Although small case series demonstrated acceptable outcomes in LVAD placement patients with obesity as a DT, there is minimal data in the literature

evaluating outcomes of bariatric surgery in patients with LVAD as approach to make them acceptable candidates for heart transplantation. This study aims to evaluate the safety and effectiveness of laparoscopic sleeve gastrectomy (LSG) in patients with previously implanted LVAD at our institution.

Methods: Patients who underwent LVAD implantation and subsequently underwent bariatric procedure from 2013 to 2015 were identified. Data collected included baseline demographics, co-morbidities, perioperative parameters, cardiac function and the postoperative outcomes. Data was summarized as median for continuous variables and as counts and percentages for categorical variables.

Results: A total of 5 patients with ESHF and implanted LVAD underwent LSG during the study period. Four patients were female; median age was 38 years (range, 26-62) and median preoperative BMI was 41.6 kg/m² (range, 36.7-56.7). Etiology for ESHF included ischemic cardiomyopathy (n=2), non-ischemic non-idiopathic cardiomyopathy (n=2) and postpartum cardiomyopathy (n=1). Preoperatively, patients were classified by New York Heart Association (NYHA) classification as class 2 (n=1), class 3 (n=2) and class 4 (n=2). The median left ventricular ejection fraction (LVEF) was 19% (range, 13-20). 4/5 patients were being bridged for heart transplantation, while 1 patient was deferred from transplantation due to the age. Baseline comorbidities included hypertension (n=5), sleep apnea (n=4), atrial fibrillation (n=4), coronary artery disease (n=2) dyslipidemia (n=2) and diabetes mellitus (n=1). Median duration from LVAD implantation to LSG was 37 months (range, 14-48). Median operative time was 168 (range, 136-208) minutes; median operative blood loss was 100 ml (range, 50-200) and median postoperative length of stay of 7 days (range, 6-17). Postoperative bleeding secondary to anticoagulation was noted in one patient on POD 2. The patient was managed medically. There was no perioperative mortality. The median follow up was 10 months (range, 3-22). At 1 year, the median LVEF was 22% (range, 16-22); median BMI was 31.9 kg/m² (range, 24.2-49.0) and %EWL was 63.4 (range, 24.3-108.4). One late mortality was noted in one patient at 22 months secondary to device associated sepsis.

Conclusion: Patients with morbid obesity, ESHF and implanted LVAD constitute a high risk cohort. LSG in these patients resulted in acceptable perioperative morbidity, weight loss and improved candidacy for heart transplantation.

Keywords: Bariatric surgery, left ventricular assist device, heart failure

A5270

Estimating Weight Loss Trajectories in Laparoscopic Sleeve Gastrectomy Patients

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Introduction: Patients undergoing sleeve gastrectomy have great variations in weight loss. The goal of this study was to establish how weight loss trajectories differ between patients that reach 50% excess weight lost (EWL) at 12 months and those that do not, and to see how patients with different pre-operative BMI differ from one another over that time.

Methods: A single institution's one year follow sleeve data was examined. 95 patients that underwent sleeve gastrectomy at our institution were followed at 6 weeks, 3, 6, 9, and 12 months. ANOVA with post-hoc Tukey tests were used to establish when patient extra weight loss plateaued. Plateau of EWL was established when follow up visits showed non-statistically significant change from the prior visit. Trends were examined for those with pre-surgical BMI of <50 kg/m² versus those with a BMI of ≥50kg/m², and for patients that met the goal of 50% EWL by 12 months and those that did not.

Results: In patients that met the weight loss goal of ≥50% EWL, their mean EWL plateaued at 9 months (59%) after significantly improving at each previous follow up (all p<0.001). Improvement continued during the plateau with non-significant difference between 9 and 12 months (p=0.748). Those that did not reach 50% EWL had a trajectory that plateaued much earlier, at 6 months with mean EWL of 31%, which did not statistically differ from later follow ups (9 mo.: 31%, p=0.874; 12 mo.: 32%, p=0.969). Also, for patients with a start BMI of <50 kg/m², their mean EWL at 12 months was 51%, having plateaued by at 45% by 6 months (9 mo.: 50%, p=0.362; 12 mo.: 51%, p=1.000). Those with a start BMI of ≥50kg/m² had a slow start with a non-significant change in weight from 6 weeks to 3 months (p=0.358). EWL increased between 3 and 6 months (p=0.007) before reaching a plateau of slower weight loss at 6 months (6 months: 31%, 9 months: 35%, 12 months: 39%).

Conclusion: Our study demonstrates that patients undergoing sleeve gastrectomy may have vastly

different weight loss trajectories. It may be feasible to estimate weight loss paths based on lack of significant weight changes in the early post sleeve period. It is clear that higher pre-operative BMI patients are clearly likely to plateau sooner. Additionally, based on the very different trajectories of patients that reached 50% EWL by 12 months and those that did not, it may be possible to provide patients with better informed expectations of their weight loss path early on following their sleeve gastrectomy.

A5271

Is endoscopic stenting for sleeve leaks always necessary? A comparison of management protocols

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Introduction: Endoscopic stent placement after sleeve gastrectomy (LSG) leak is usually considered part of the treatment algorithm. We have experienced varying success with stents and have also seen patients who have difficulty tolerating the stent or who have experienced worsening leak with the stent. The purpose of this study is to review our experiences with these stents to contribute to the growing literature of the effectiveness in the management of sleeve leaks.

Setting: Academic medical center.

Methods: A retrospective review of all reported sleeve leaks between 2 high-volume bariatric surgery centers were reviewed. Data was collected on the presentation of these leaks as well as the entire post-operative course. Cases spanned from 2006 to 2016. Information was collected on clinical presentation, radiographic findings, endoscopic findings, stent placement, stent complications, re-intervention rate, and re-operation rate. Stent complications were defined as any persistent leak, PO intolerance, nausea/vomiting, radiographic evidence of migration, or abdominal pain that required either replacement/repositioning or removal of the stent.

Results: 32 sleeve leaks were identified across our institutions. Two cases were excluded for lack of post-operative course data. 18 (60%) of 30 were treated at some point with an endoscopic stenting procedure. Complications that could be attributed directly to the stent were identified in 14 of the 18 cases (78%). The average number of interventions in the stent group was 3.7 compared to 0.75 in the no stent group ($p < 0.005$). The average number of total admitted days was significantly higher in the stent group with 25.5 days versus 12.58 ($p = 0.006$).

Conclusion: Patients who undergo stenting for the management of leak following a sleeve gastrectomy appear to require more interventions and have higher length of stay. Further studies are needed in order to better identify those patients who may benefit from endoscopic interventions and those who should be managed alternatively.

A5272

THE IMPACT OF A SLEEVE GASTRECTOMY CLINICAL PATHWAY ON OUTCOMES AND HOSPITAL COSTS

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Aims: Our institution implemented a Value-Based Medicine (VBM) clinical pathway to standardize the pre-, peri-, and post-operative management of longitudinal sleeve gastrectomy (LSG) patients. The goal of the program was to decrease patient length of stay (LOS) while maintaining the same clinical outcomes seen prior to initiation.

Methods: The VBM pathway was instituted in September of 2014. A retrospective review was performed of all primary LSG cases from 2011-2015. Pre-VBM LSG patients were matched to post-VBM patients in a 1:1 ratio. Matching criteria were age within five years, body-mass index (BMI) within 5 kg/m², expected LOS within 0.5 days, same sex, and same status for prior abdominal surgery. Patients < 18 years of age, body mass index (BMI) < 35, and those with prior bariatric surgery were excluded from analysis. Primary outcomes were LOS, LOS > 2 days, operating room (OR) time, and cost per admission. Secondary outcomes included 30-day readmissions and reoperations.

Results: There were 426 pre-VBM and 507 post-VBM patients. After matching for age, sex, BMI, expected LOS and previous abdominal surgery, there were 330

patients in each of the pre-VBM and post-VBM groups. There were no clinically significant demographic differences between the two groups. The post-VBM group had shorter mean OR time (75.1 vs 95.8 min, $p < .0001$), shorter LOS (1.50 vs 1.94 days, $p < .0001$), lower cost (median cost \$792 less than pre-VBM group, $p < .0001$), and lower reoperation rate (0.0% vs 2.1%, $p = .015$). Readmission rate was lower in the post-VBM group, but did not reach statistical significance (2.7% vs 4.9%, $p = .154$). After controlling for hospital trends over time, LOS > 2 days ($p = .008$) and median cost ($p = .019$) remained significant. OR time ($p = .058$) and mean LOS ($p = .338$) still showed an improved trend, but could not be directly correlated to VBM implementation.

Conclusions: Standardization of clinical care for LSG patients is feasible and effective. Patient length of stay and hospital cost were successfully decreased with no negative impact seen on 30-day post-operative outcomes.

A5273

Laparoscopic conversion of Sleeve Gastrectomy to RNY gastric bypass for intractable functional nausea and PO intolerance.

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Background: Nausea and emesis after sleeve gastrectomy without an anatomical cause is rare. Symptoms requiring parenteral nutrition and excessive weight loss from such nausea is also rare. This video represents the laparoscopic conversion of sleeve gastrectomy to RNY gastric bypass as a treatment option. This video also demonstrates our technique of conversion from a sleeve to RNY gastric bypass.

Methods: 62 yr old female with BMI of 41 underwent laparoscopic sleeve gastrectomy for morbid obesity. A 40 Fr Bougie was used to size the gastric sleeve. Patient was discharged to home on post operative day 3, tolerating a Bariatric liquid diet. 3 weeks post op she started complaining of nausea and intolerance to PO liquids. After failing oral anti-emetic therapy an UGI study was obtained which did not reveal any abnormalities with the sleeve anatomy. No stenosis or angulations were seen. Contrast passage into the duodenum was normal, without delay. She continued to have nausea and needed several ER visits for IV hydration.

An upper endoscopy confirmed UGI findings of normal sleeve anatomy, without stenosis or angulations. Some gastric polyps were excised. She continued to have nausea and needed TPN. She lost 80% of EBW in 5 months post operatively and had extreme fatigue. It was decided to proceed with revision of sleeve gastrectomy to RNY gastric bypass. The procedure was completed laparoscopically and an antecolic/ antegastric RNY gastric bypass was performed.

Results: Post operatively she tolerated a full liquid bariatric diet without any complaints of nausea or vomiting. She subsequently tolerated a soft bariatric diet. On her 6 week follow up, there was no more nausea and her weight loss stabilized.

Conclusion: Intractable nausea and vomiting after a sleeve gastrectomy, without any anatomical cause, is rare. Conversion to RNY gastric bypass is a treatment option.

A5274

Long-term (11+ years) outcomes in weight, patient satisfaction, comorbidities- and gastro-esophageal reflux treatment after Laparoscopic Sleeve Gastrectomy

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Background: >10 years outcomes for sleeve gastrectomy (LSG) have not yet been documented.

Objectives: retrospective analysis of 11+ years outcomes of isolated LSG: progression of weight, patient satisfaction and evolution of comorbidities and gastro-esophageal reflux disease (GERD) treatment.

Methods: chart review + personal interview in consecutive patients who underwent primary isolated LSG between November 2001 and June 2003.

Results: Of the 110 consecutive patients, complete follow-up data was available in 65 (59.1%). Mean follow-up was 11.7 \pm 0.4 years. Two patients had died of non-procedure related causes. Twenty (31.7%) patients underwent 21 re-operations related to the LSG: 14 conversions (10 to Duodenal Switch (DS), and 4 to Roux-en-Y gastric bypass (RYGB)) and 3 re-sleeve procedures for weight issues, and 2 conversions (RYGB) and 2 hiatal hernia repairs for GERD. Consequently, 16 patients were converted to another than the sleeve anatomy, while 47 (74.6%) individuals kept the simple sleeve construction. In this latter group % of excess body mass index loss (%EBMIL) at 11+ years was 62.5%, versus 81.7% ($p < .015$) in the former group. Mean

%EBMIL for the entire cohort was 67.4%. At 11+ years postoperatively, 30 patients versus 28 preoperatively required treatment for comorbidities. None of the 7 patients who preoperatively suffered from GERD were cured by the LSG procedure. Nine additional patients developed de novo GERD. Overall satisfaction rate was 8 (IQR 2) on a scale of 0-10.

Conclusion: isolated LSG provides a long-term %EBMIL of 62.5%. When conversion to another construction is deemed necessary weight loss is significantly better. Patient satisfaction score remains good despite unfavorable GERD outcomes.

A5275

Long-term results in sleeve gastrectomy

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Background: Sleeve gastrectomy (SG) has become a good alternative as a primary bariatric surgical technique. Weight loss is adequate in the short term, although long term results can be disappointing. The objective of this study is to present weight loss results of SG after seven years.

Methods: Retrospective series. Excess weight loss (EWL%) of patients who underwent SG between 2008 and 2011 is reported. Lineal regression was used to determine preoperative variables with weight risk regain.

Results: 131 patients met the inclusion criteria. 76.3% were female. Mean preoperative BMI was 34.4 kg/m². Mean operative time was 88.6 minutes. Follow-up at 5, 6 and 7 years was 80.2%, 89.8 and 77.8 respectively. Median EWL% at 1, 3, 5 and 7 years was 89.4, 76.6, 64.3 and 45.5%. A 31.4% of the patients at the fifth year and a 57.1% at the seventh year reached EWL of less than 50%. Preoperative BMI >40 kg/m² was associated with weight regain.

Conclusion: Sleeve gastrectomy has good results in terms of weight loss until the third year. After the fifth year, weight regain incidence raises. Morbid obesity could be a risk factor for weight regain.

A5276

LSG for Asian super obese, BMI ≥47.5kg/m², is equally safe and effective in comparison to those with BMI <47.5kg/m²

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Aim: To compare short-term outcomes of laparoscopic sleeve gastrectomy (LSG) in Asian patients with BMI <47.5kg/m² to those with BMI ≥47.5kg/m². Materials and

Methods: 272 patients who underwent LSG between 2008-2015 with a follow up of at least 6 months were included. Primary end point was weight loss and secondary end points were perioperative and co-morbidity outcomes. Morbid obesity (Group 1, G1) was defined as BMI<47.5kg/m² & super obesity (Group 2, G2) as BMI≥47.5kg/m² based on WHO recommendations to decrease Asian BMI cut-offs by 2.5 points.

Results: There were 215 patients in G1 & 57 in G2 with mean preoperative weight of 107.3 +- 17.3 & 146.8 +- 26.8kg respectively. Mean follow up duration was 27.9 & 26.8 months. Mean total weight loss at 3 years of 41.9kg for G2 was significantly higher (p=0.003) than 27.2kg for G1. At 2 years, mean percentage excess weight loss (%EWL) was 59.6 in G1 & 46.9 in G2 (p=0.006) but no difference was noted at 3 years. There was no difference in: mean operating time, blood loss, 30 day morbidity and readmission. There were no conversions and mortality in both groups. The median length of stay was 3 days and didn't differ between groups. 54.5% in G2 vs 33.9% in G1 had remission of Type 2 Diabetes Mellitus at 1 year, although this trend didn't achieve statistical significance. Remission of hypertension (p=0.001) and dyslipidemia (p=0.038) were significantly associated with achieving %EWL>50 in G1.

Conclusion: LSG is an equally safe and effective operation in Asian patients with BMI≥47.5kg/m² when compared to patients with BMI<47.5kg/m² in achieving significant weight loss and improvement in co-morbidities. Super obese lose more weight but have lower %EWL.

A5277

Short Term Outcomes of Laparoscopic Sleeve Gastrectomy (LSG) for Super-Obese Asians

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Introduction: LSG is a safe and effective operation for achieving significant weight loss and improvement of co-morbidities. Despite this, there is a paucity of data on the outcomes in the super-obese multiethnic Asian cohort.

Aim: To report the short-term outcomes of LSG for the super-obese in a multiethnic Asian cohort.

Methods: Patients were selected from a prospective database of 299 patients who underwent LSG in our institution from 2008 - 2015. Super-obesity was defined as a BMI >50kg/m². A retrospective analysis on a prospective cohort of 48 consecutive super-obese patients was performed. The primary end point was the weight loss in super-obese patients. These patients were analyzed for changes in percentage excess weight loss (%EWL), total weight loss (TWL), percentage excess weight loss (%TWL) and mean change in BMI (DBMI). Secondary end points included the metabolic responses of co-morbidities such as type II diabetes, hypertension and hyperlipidemia. Weight loss and metabolic responses were based on ASMBS standardized reporting guidelines.

Results: LSG was performed on a cohort of 48 patients that consisted of 25 (52.1%) Malay, 15 (31.3%) Chinese, 7 (14.6%) Indian, and 1 (2.1%) patient from other ethnic groups. Mean age was 39.8 years (range, 18 - 67) and there were an equal number of males and females. Mean pre-operative BMI was 55.8kg/m² and mean excess weight was 89.1kg (range, 56.7 - 161.5kg). Majority, 79.2% (n=38), had associated co-morbidities, with hypertension being the most common, 52.1% (n=25). Follow up rates were 75% (n=36), 70.8% (n=34) and 20.8% (n=18) at 6, 12 and 24 months respectively. Mean operative time was 111 minutes (range, 40-234) with none requiring conversion to open surgery. There was no 30-day mortality. Morbidity included a staple line leak and a small bowel injury. At 12 months post LSG, 41.2% achieved %EWL >50%. Majority, 52.9% (n=18) achieved % EWL between 20-50%. Mean TWL was 43.23kg (SD+17.90). %EWL and %TWL changed significantly over the first 12 months (p<0.05) and subsequently stabilized (p>0.05). The mean % EWL, %TWL and DBMI were 46.68% (SD+14.61), 29.47% (SD+8.94) and 15.88kg/m² (SD+6.10) respectively. All seventeen patients (35.4%) who had type II diabetes preoperatively were on anti-diabetic medication. Five patients (10.4%) were additionally on insulin.

The mean pre-operative HbA1C was 8.6% (SD+2.10). At 12 months post LSG, 41.2% (n=7) achieved complete remission and 11.8% (n=2) achieved partial remission. The mean HbA1C improved by 2.9% (SD+0.57, p<0.05). All twenty-five patients (52.1%) who had hypertension preoperatively were on anti-hypertensive medication. At 12 months post LSG, 84% (n=21, p<0.05) had complete remission and 80% (n=20) had normalization of blood pressure as early as 1 month post LSG, of which 15.0% (n=3) were in the absence of any anti-hypertensive medication. Twenty patients (39.6%) had hyperlipidemia preoperatively and 60% (n=12, p<0.05) had remission of hyperlipidemia at 12 months post LSG.

Conclusion: LSG is a safe and effective procedure for the super-obese in the multiethnic Asian cohort. It has significant short-term outcomes in terms of weight loss and the remission of co-morbidities such as type II diabetes, hypertension and hyperlipidemia.

A5278

Significant twelve month weight loss variability after sleeve gastrectomy: one surgery does not fit all.

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Background: Although the sleeve gastrectomy (SG) is currently the most popular bariatric performed procedure in the United States, increasing post-operative experience with the SG has shown marked variability in nadir weight loss outcomes. The LABS-2 study has robustly reported the variability of weight-loss outcomes after Roux-en-y gastric bypass with ¼ of patients losing <25% total body weight and ¼ losing >38% total body weight. While there are numerous publications of short-term, mid-term, and long-term average weight loss outcomes, the individual variability of weight loss outcomes after SG has been minimally investigated. We report both the 12 month total weight loss percentage (TWL%) after sleeve gastrectomy as well as patterns of weight loss over time based on time to weight loss plateau in the first year.

Methods: A bariatric database was retrospectively reviewed for patients who underwent a SG as a primary bariatric procedure from 01/2012-3/2015. %TWL was calculated at 2 weeks, 1 month, 3 months, 6 months, 9 months and 12 months post-operatively. 12 month %TWL was divided into categories of <20% TWL, 20-24% TWL, 25-29% TWL,

30-35% TWL, and >35% TWL. %TWL over time was also categorized into 4 similar weight loss trajectories by the time to weight loss plateau (≤ 2 % TWL change or weight gain from the prior visit starting at 3 months post-operatively). Patients were excluded who did not have a 12 month %TWL, were missing two consecutive data points over the 12 month period, who underwent revisional surgery in the first year, who required additional enteral or parental nutrition due to post-operative complications, or were diagnosed with a severe illness such as cancer that might affect post-operative weight loss. Missing data points for weight loss over time were extrapolated only if a visit weight was available both before and after the missing time point.

Results: The average 12 month %TWL was 27.7 \pm 8.3% (n=134). However, when examining the individual weight loss outcomes, 19.4% (n=26) of patients achieved <20% TWL. 16.4% (n=22) achieved 20-24% TWL. 23.1% (n=31) achieved 25-29% TWL. 20.9% (n=28) achieved 30-34% TWL. Finally, 20.1% (n=27) achieved >35% TWL at 12 months post-operatively (Figure 1). Of pre-operative factors examined for weight loss including age, pre-operative BMI, gender, type 2 diabetes, GERD, hypertension and hyperlipidemia, patients with a TWL<20% were significantly older than patients with TWL>35% (50.2 years vs 40.4 years, $p<0.01$) and had a significantly higher incidence of type 2 diabetes pre-operatively (67% vs 24%, $p<0.05$). Regarding post-operative obesity-associated co-morbidity resolution, patients with TLW <20% were significantly more likely to require medications for hypertension at 12 months compared to patients with a TWL >35% (69.2% vs 22.2%, $p<0.01$). 5.5% of patients plateaued at 3 months after surgery. 33.3% of patients plateaued at 6 months after surgery. 25.4% of patients plateaued at 9 months after surgery, and 35.7% of patients were still losing weight at 12 months. Patients who plateaued at 3 and 6 months lost significantly less weight at 12 months, 22.3 \pm 6.9% TWL, than those who plateaued at 9 or 12 months, 31.3 \pm 6.8%, $p<0.001$.

Conclusions: This study finds there is significant weight loss variability after a SG. While bariatric surgeon's counsel patients a procedure average, in our study 28% TWL at 12 months, we found that over 40% of patients will fall outside a 15% window around this average with exceptional weight loss success or disappointing weight loss failure. Co-morbidity resolution was affected for those patients with weight loss failure. Weight loss variability and

co-morbidity resolution likely lies in the responsiveness of the individual to the mechanisms that produce weight loss and metabolic improvement after a sleeve gastrectomy. Understanding the mechanisms of weight loss and co-morbidity improvement after sleeve gastrectomy will lead to a better ability to predict and tailor surgical weight loss and metabolic surgery to the individual patient.

A5280

Early weight loss after laparoscopic sleeve gastrectomy predicts mid-term weight loss in morbidly obese Asians

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Aim: To investigate the effect of initial weight loss on mid-term weight maintenance and the remission of co-morbidities after laparoscopic sleeve gastrectomy in morbidly obese Asians.

Materials and methods: We conducted a retrospective analysis of a prospective database of consecutive LSG procedures performed from July 2008 to April 2015. Percentage excess weight loss (EWL) was calculated at 1, 3, 12, 24, and 36 months after surgery. Successful weight loss was defined as EWL >50% after surgery. Remission of hyperlipidemia, type 2 diabetes and hypertension was considered if post-operative investigation results fell below diagnostic values without medication at 1 year. Patients who did not complete their 6-month review were excluded from the analysis. Patients who did not complete 1-year follow-up were excluded from the analysis for remission of co-morbidities.

Results: 272 patients were included in this study. Mean age was 39.4 \pm 11.4 years and mean BMI was 42.5 \pm 8.0 kg/m². Of these patients, 108 (40%) had hyperlipidemia, 81 (30%) had type 2 diabetes, and 130 (48%) had hypertension. Mean follow-up duration was 27.6 \pm 16.4 months with a follow-up rate of 66.4%, 54.7% and 46.6% at 1, 2 and 3 years after LSG. Successful weight loss of >50% EWL was achieved by 65.7%, 65.5% and 50.8% of patients at

1, 2 and 3 years after LSG. There was a significant correlation of %EWL at 3 months with %EWL at 1 year ($R^2=0.471$, $p < 0.005$), 2 years ($R^2=0.391$, $p < 0.005$), and 3 years ($R^2=0.373$, $p < 0.005$). ROC analysis was performed and an initial EWL of 35.0% was found to best predict successful weight loss at 1 year (sensitivity 73.1%, specificity 81.4%). Patients that achieved >35.0% EWL were significantly more likely to achieve remission of hyperlipidemia ($p=.0035$), type 2 diabetes ($p=.0024$) and hypertension ($p=.0031$) at 1 year after surgery.

Conclusion: Early weight loss at 3 months can be used as a prognostic factor to predict weight maintenance up to 3 years and remission of comorbidities at 1 year after LSG in Asians.

A5281

Safety and Efficacy of Laparoscopic Sleeve Gastrectomy as a Final Treatment Modality for Patients with Severe Obesity. A Single institution 10-year experience in over 1300 patients.

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Background: Laparoscopic Sleeve Gastrectomy (LSG) has become the most common bariatric procedure both in the United States and Worldwide. The aim of our study was to assess the safety and efficacy of LSG in our large single-institution series.

Methods: We concurrently collected and retrospectively reviewed the electronic medical records of all patients that underwent Laparoscopic Sleeve Gastrectomy (LSG) from November 2004 to September 2015 at our Institution.

Results: A total of 1503 LSG were reviewed. Non primary operations ($n=185$) were excluded. Data was analyzed for the remaining 1318 patients. Table 1 presents the basic demographic information and the rate of comorbidities of our population. Staple line disruption was encountered in 1 patient (0.07%), and it resolved with relaparoscopy, lavage and drainage. Obstruction and bleeding were present in 8 patients (0.61%) and 4 patients (0.3%) respectively. Other minor complications are summarized in Table 2. There were no mortalities in this series. The mean Estimated Weight Loss (EWL) at 5 years was 57.61 +-

26.56 per cent and the average body mass index (BMI) 30.95 +- 6.22 kg/m².

Conclusions: Our experience has shown that patients undergoing LSG have excellent long-term %EWL with concurrent decrease in BMI and an acceptable risk/benefit ratio. LSG appears to be a safe and effective weight loss procedure in the hands of bariatric surgeons at accredited centers.

A5282

Long Term Results (8 years) Of Sleeve as Revisional Surgery after Gastric Banding

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Introduction: Laparoscopic Sleeve Gastrectomy (LSG) became the most frequent bariatric procedure performed in France (2011) and in the USA (2013), but studies reporting long-term results are still rare.

Methods: This is a retrospective analysis of a prospective cohort of 99 patients who underwent a LSG between 2005 and 2007. Of the 99 patients initially included, 17 were lost and 12 underwent a conversion throughout the study. Those patients were excluded from the study at 8 years. In 42 patients, LSG was performed as a primary obesity surgical procedure (group A), and 28 patients received LSG as secondary treatment after failed gastric banding (group B). The objective of this study is to compare the 5 and 8-year outcome in terms of weight-loss between primary and revisional LSG.

Results: The preoperative median body mass index was 43,65 kg/m² (34 - 66,3) for group A, 42,3 kg/m² (35,7 - 77,9) for group B. Twenty patients were super-obese in group A and 6 patients in group B. Five years after LSG, the median BMI was 42,8 kg/m² (34 - 64,8) in group A and 42,2 kg/m² (36 - 58,1) in group B was reached, corresponding to a median EWL of 70% (23 - 138) and 82% (18 - 149), respectively. Eight years after LSG, a median BMI of 42,65 kg/m² (34 - 64,8) in group A and 42,1 kg/m² (36 - 58,1) in group B was reached, corresponding to an EWL of 63,5% (4 - 134) and 67,5% (28 - 166), respectively. Of the 42 patients with 8 years of follow-up in group A, 29 patients (69%) had > 50% EWL at 8 years compared to 23 patients (82,1%) out of 28 in group B. Three patients (6,7%) had revisional surgery in group A for weight regain at a mean period of 44,7 months (35 - 50). Nine patients (24,3%) had revisional surgery in group B: for weight

regain (7 cases) or for severe reflux (2 cases) at a mean period of 59,4 months (36 - 102).

Conclusions: At 8 years postoperative, the LSG as a definitive bariatric procedure remained effective for 69% as primary procedure and in 82% as revisional procedure. However, conversion rates reach 24,3% in group B, while 6,7% only of the initial patients in group A underwent a conversion. Hence, the results appear to be more favorable for primary procedures.

A5283

Safety and Effectiveness of Sleeve Gastrectomy in a Community Based Practice

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Background: Sleeve Gastrectomy has emerged as the procedure of choice for the majority of morbidly obese patients. Sleeve Gastrectomy has been shown to be almost as effective as the Roux-en-Y Gastric Bypass in regards to weight loss, while avoiding the complications of malabsorption, internal hernias, and marginal ulcers. Leak rates, the most dreaded complication following sleeve gastrectomy, have been reported to be 1-2% in the surgical literature. The most recent MBSAQIP data reports the leak rates after sleeve gastrectomy to be 0.4%. We report the safety and effectiveness of this surgery in a private practice setting with a comprehensive multi-disciplinary team providing pre- and post-op care of the patients performing surgery at 2 affiliated community hospitals. While many previous papers and presentations have focused on the actual surgical procedure or techniques, this paper stresses the importance of the pre-op and post-op education and care given to the patients to minimize risks of complications.

Methods: A retrospective study of patients undergoing sleeve gastrectomy from Jan. 1, 2012 to December 31, 2015 was conducted. Data was prospectively collected and submitted to the SRC or ACS-ASMBS MBSAQIP. A total of 2055 patients underwent laparoscopic sleeve gastrectomy at two MBSAQIP Accredited Facilities. All complications were reported to the SRC or ACS-ASMBS MBSAQIP

database. All surgeries were performed with the use of a 40 F Bougie to guide the gastric resection. All surgeries were performed using the Covidien Tri-Staple loads either with the i-Drive or the manual Endo-GIA Universal handles for gastric division. All surgeries were performed using the Covidien Ligasure Advance bipolar device for the dissection of the greater curvature of the stomach. During the pre-operative period, each patient was provided extensive education by our nursing staff, our dietitians, and our nurse practitioners, as well as by the surgeons in regards to the prescribed diet as well as the technical aspects of how to drink fluids and eat foods. Our peri-operative anesthesia and pain management protocols evolved during the period of this study. All patients received a pre-operative. During surgery, all patients received dexamethasone and ondansetron. IV acetaminophen was routinely administered during and after surgery beginning in 2013. Transversus abdominus plane (TAP) blocks were routinely administered before incision beginning in 2013. We have observed a significant decrease in post-operative pain and opiate utilization with the introduction of these two modalities. A very strict post-op regimen was prescribed to each patient consisting of limiting oral intake to 3 oz. of clear sugar-free fluids per hour for 5 days, followed by limiting oral intake to 12 oz. of fluids per hour to include 3 servings of liquid protein and other sugar free liquids for at least 2 weeks. The next phase required patients to stay on a pureed consistency diet for at least another 2 weeks prior to being advanced to a regular consistency diet. Our program also has established a 'speed limit' of 1 oz. per five minutes of either liquids or food to minimize reflux, dysphagia, stretching of the stomach, and weight regain. All patients were required to be seen within 1 week post-op, then at 2 week intervals for at least 2 months, and then at 1 month intervals until their goals were achieved.

Results: N= 2055 The %EWL at 1 year was 58%. The 30-day mortality was 0%. The 30-day morbidity included the following: Early leaks (within 6 weeks) = 0 (0%) Bleeding requiring transfusions or reoperation = 3 (0.15%) DVT = 3 (0.15%) Portal vein thrombosis = 2 (0.10%) Dehydration and/or electrolyte imbalance = 10 (0.83%) Pneumonia = 2 (0.10%) Incisional hernia = 2 (0.10%) Surgical site infection = 8 (0.39%) The 30-day readmissions were = 43 (2.09%) There was one late leak presenting at 10 weeks post-op (0.05%)

Discussion: Sleeve gastrectomy is a safe and effective procedure for weight loss. It has also emerged as the procedure of choice for the majority of bariatric surgery practices as well as the patients seeking bariatric surgery. While the safety of the sleeve gastrectomy has been proven in the surgical literature to be acceptable, it may be possible to further improve upon the safety profile. Better safety outcomes than are currently observed may be achieved with continual improvement of the surgeons' technical skills and the use of the best surgical stapling devices and energy dissection devices. We propose that further increases in the safety of the procedure can be achieved by contributions from the Integrated Health Team within the bariatric surgery practice, with respect to the following:

- Pre-op teaching and preparation of the patient
- Strict post-op regimen limiting the pace, quantity, and quality of oral intake
- Intensive post-op follow-up protocol requiring visits every 2 weeks for at least 2 months, followed by at least monthly visits for 1-2 years"

A5284

Is laparoscopic greater curvature gastric plication a valuable operation for patients with morbid obesity? Follow-up of 61 consecutive patients

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Background: Obesity is a major public health problem. Bariatric Surgery is recognized as an effective way to treat morbid obesity. Laparoscopic great curvature gastric plication (LGCGP) is a restrictive bariatric surgery, currently under investigational. The goal of this study is to determine the safety and efficacy of this weight loss procedure.

Method: A retrospective analysis of our single institution prospectively collected bariatric database between February 2006 and April 2013 yielded 61 patients who underwent LGCGP. Data was collected through routine follow-up at 6, 12, 18 and 24 months. Demographics, complications, need for re-operation and percentage of excess weight loss (%EWL) were determined.

Results: LGCGP was performed on 61 patients: 55 females and 6 males with a mean age of 39.5 years (SD+-12.5). Mean pre-operative BMI for these patients was 40.3 Kg/m² (SD+-5.5). There were no

per-operative complications. The mean %EWL was 38.6 (SD+-28.9) at 24 months. Nineteen patients (31%) reported post-operative complications within 30 days, including 2 cases of gastric leak and 3 cases of intra-abdominal abscess. Thirty-two patients (52.5%) needed re-operation: 8 for complications related to the LGCGP and 24 (39%) for failure of LGCGP. The 29 patients who were not re-operated had a mean %EWL of 39 at more than 24 months.

Conclusion: LGCGP is not an efficient weight loss procedure for patients with morbid obesity. It is associated with more than 50% re-operation for complication or failure of the LGCGP. It is also associated with insufficient weight loss in non-re-operated patients.

A5288

"Less is More"- Avoidance of Buttress Material and Post Operative Anticoagulation without Leak, Stricture or Readmission

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Introduction: Less can indeed be more when it comes to cost effectiveness and perioperative care for Vertical Sleeve Gastrectomy (VSG). VSG has become the most popular stapling procedure in Bariatric surgery in the United States. Potential complications are known to include bleed, stricture and leak. The purpose of this report is to assess the modifications and standardizations we have developed in a community-hospital setting at Northern Westchester Hospital in Westchester County, NY, and the outcomes we observed.

Methods: All VSG were performed laparoscopically by a single surgeon with similar anesthetic team. First fire of the stapler is taken with articulation and the second fire is in the neutral position. All VSG were oversewn to the omentum, recreating the greater curvature of the stomach. A single dose of Lovenox was administered preoperatively on-call to the OR, and Venodyne boots were utilized in the operating suite. Patients were ambulated immediately after leaving the Recovery Room, and were started on a clear liquid Bariatric Stage 1 diet.

Results: A total of 200 cases were performed in 2014 and 2015. 30.5 percent of the patients were male, and 69.5 percent were female. The mean age was 45.4 years; the MBSAQIP data registry comparative mean age was 45.2 years. Mean baseline BMI was 42.7; the MBSAQIP data registry comparative mean baseline BMI was 45.35. For the 6 month short-term

follow-up of 153/200 patients, or 76.5% of patients observed, the mean baseline BMI was 43.0; the MBSAQIP data registry comparative was 45.44. The follow-up mean percent of weight loss toward ideal BMI was 0.46; the MBSAQIP data registry comparative mean percent of weight loss toward ideal BMI was 0.43. For the 1 year short-term follow-up of 56/200 patients, or 28% of patients observed, the mean baseline BMI was 44.0; the MBSAQIP data registry comparative was 45.74. The follow-up mean percent of weight loss toward ideal BMI was 0.63; the MBSAQIP data registry comparative mean percent of weight loss toward ideal BMI was 0.59. There was a single return to the OR for bleeding of an epiploic vessel, resulting in a reoperation rate of 0.5% during that time period. Readmission rate was 0% in both 2014 and 2015. No leaks or strictures developed. There were no readmissions for nausea/vomiting, or fluid, electrolyte or nutrition depletion. There were no venous thrombotic events. 55 percent of the patients were discharged on POD1 in 2015, and 36 percent in 2014.

Conclusion: An experienced team, exceptional technique and proper education demonstrate that excellent outcomes can be achieved without the use of adjunct buttress materials in performing VSG. Our results reflect a low bleeding rate and no increase in venous thrombosis events, without the administration of postop anticoagulation and with rapid postop patient ambulation. Technique may account for keeping readmission rates low, in addition to education and access to expert personnel.

A5289

EFFECTS OF BARIATRIC SURGERY ON THE QUALITY OF LIFE AND SEXUAL FUNCTION: SLEEVE GASTRECTOMY VERSUS ONE ANASTOMOSIS GASTRIC BYPASS

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Aim and Background: Bariatric Surgery is being increasingly performed by many surgeons. It's effects on weight loss and obesity related disorders are very well recognized however data evaluating quality of life following bariatric surgery is inconclusive. The aim of the present study is to

investigate the impact of different surgical procedures on postoperative quality of life and sexual function together with weight loss and surgical technique.

Patients and Methods: 60 (51F) patients [Laparoscopic sleeve gastrectomy (LSG; n=30) and one anastomosis gastric bypass (LOAGB; n=30)] who underwent bariatric surgery for morbid obesity were included in the study. The selection method based on the criteria adopted by our group. Body Mass Index, body weight loss, excess body weight loss, Gastrointestinal Quality of Life Index and sexual functions (by using GIQLI, FSFI and EDF questionnaires) were prospectively collected for each patient on preoperative, postoperative 1st,, 3rd, and 6th months and the two study (LOAGB and LSG groups) were compared.

Results: 30 patients (28 F) had undergone LSG and 30 (23 F) patients had undergone LOAGB (23Female). The mean age of the patients were 38.3(20-61) years. Preoperative mean body weight (kg), BMI (kg/m²) and Excess Body Weight in the 6th postoperative months (kg) were 117,3(93-144) kg, 43,3(35,8-56) kg/m², 31,9 (25,8-33,8) kg in the LSG group and 133,2 (102-193) kg, 49 (40,6-66,9) kg/m² and 36,5 (27,8-51,9) kg, respectively. Body weight loss were significantly higher in the LOAGB group especially in the postoperative 1. and 3. month. When comparing GIQLI scores, quality of life had improved through 1., 3. and 6. month according to preoperative period in both groups. LOAGB was found to be more effective than LSG in total scores in the 1. and 3. month ,but the difference was not significant in the postoperative 6. month. FSFI-EDF scores were improved in both groups but LOAGB was found to be more effective (all; p<0.05).

Conclusions: Both techniques are effective in controlling body weight in morbid obese patients. Body weight loss was significantly high in the LOAGB group. Although LOAGB is technically more complex procedure, due to the superior patient satisfaction rate (quality of life and improvement in sexual function) LOAGB is the procedure of choice in selected patient groups (BMI>50, sweet-eater, severe obesity). Both LOAGB and LSG can be safely performed in other morbid obese patients.

A5290

Rat models of Mini Gastric Bypass and Single-Anastomosis Duodenal-Switch lead to metabolic improvements similar to Roux-en-Y Gastric Bypass and Vertical Sleeve Gastrectomy.

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Mini Gastric Bypass (MB) and Single-Anastomosis Duodenal-Switch (SADS) are becoming increasingly common bariatric surgical procedures. While these procedures are still outnumbered by Roux-en-Y Gastric Bypass (RYBG) and Vertical Sleeve Gastrectomy (VSG), their clinical effect on weight loss and glucose regulation is significant. By using preclinical animal models of bariatric surgical procedures, we can systemically compare metabolic outcomes across surgeries in a highly controlled manner.

Diet-induced obese Long-Evans rats underwent MB, SADS, RYGB, VSG, or a sham surgery (control group). All rats were maintained on a 45% high-fat diet before and after surgery. Compared to control, all bariatric surgical groups lost weight and maintained a lower body weight for 15 weeks after surgery. Body fat composition was similarly altered with the highest percent fat loss occurring after MB and RYGB. Cumulative food intake was reduced following the MB and VSG as compared to control. Following an oral mixed-meal tolerance test, all surgical groups had improved glucose dynamics as compared to control. This was due in part to an increase in insulin and total GLP-1 within the surgical groups. Compared to control, MB and SADS exhibited a significant increase in glucose-stimulated insulin response whereas MB and RYGB exhibited a significant increase in glucose-stimulated GLP-1 response. Fasting glucose was significantly decreased following VSG compared to control. These data recapitulate the clinical observation that bariatric surgical procedures lead to significant and sustained weight loss. Similarly, we observed significant improvements in glucose regulation in our preclinical rat models. However, our data indicate that each surgery may accomplish these metabolic improvements through different mechanisms – demonstrated by differential changes in food intake, insulin, and GLP-1 response. Future studies using preclinical animal models can elucidate the specific underlying mechanism(s) leading to therapeutic changes in metabolism in each unique bariatric surgical procedure.

A5291

Robotic gastric bypass surgery in the Swiss healthcare system: Analysis of hospital costs and reimbursement

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Introduction: Robotic technology shows promising early outcomes indicating potentially improved clinical outcomes particularly for challenging procedures. In the field of bariatric surgery, this might mean the enabling of “hand-sutured” anastomoses during gastric bypasses as well as minimally invasive revisional procedures. However, most health care systems do not reimburse the additional costs of robotics that are imposed to the health care provider during the peri-operative period. As such, financial barriers installed by hospital administrations can be observed in such healthcare environments that prevent a widespread application of robotics. Since 2012, Swiss healthcare system uses the Swiss Diagnosis Related Groups (Swiss-DRG) to determine reimbursement. In this system, each patient is assigned with a DRG that is derived from the primary diagnosis, surgical procedure, co-morbidities and or complications and a flat fee reimbursement is paid for each DRG without any additional pay for high technology devices such as a robot. Surcharges are issued for patients with a longer length of stay or an additional “private” insurance. In that context, it is important to know if a robotic procedure can be offered with adequate financial coverage and thus the purpose of this analysis is to compare the costs and reimbursement of robotic gastric bypass surgery in the Swiss healthcare system, which utilizes a flat per patient fee using Swiss Diagnosis Related Groups. **Methods:** Prospectively derived administrative cost data of patients who were coded with a primary diagnosis of obesity (ICD-10 code E.66.X), a procedure of gastric bypass surgery (CHOP code 44.3), and a robotic identifier (CHOP codes 00.90.50 or 00.39) during the years 2012 to 2014 was analyzed and compared to the triggered reimbursement for this patient cohort. All cost data was elaborated using the REKOLE method, which is the national standard for cost analyses and includes per patient costs for all materials, personnel and hotel services. REKOLE data is used in Switzerland to determine reimbursement and to calculate national

statistics. The hospital administration attributed a lump sum per robotic procedure for capital investment and yearly service fee per patient from 2014. This sum was assigned to all patients before analysis.

Results: A total of 254 patients were identified. The mean number of diagnoses was 2.5 and the mean length of stay was 5.5 days. The overall mean cost per patients was United States Dollars (USD) 19 027 (+/-8 624.7), with the most significant posts for operating room (USD 5 164.0 +/-2 219.5), nursing (USD 3 382.0 +/-2 820.1), anesthesia (USD 2 926.0 +/-947.3), medical personnel (USD 1 887.0 +/-1 232.0), and the administrative fee for using the da Vinci Surgical System (USD 1519.0 +/-0.0). All patients were attributed with the DRG K04A, which resulted in a base reimbursement of USD 22 636.8 in 2012, USD 20 913.8 in 2013 and USD 20 905.0 in 2014 without surcharges. The mean overall reimbursement for 2012 to 2014 including surcharges for patients with a longer length of stay and privately insured patients was CHF 24 917, showing a progressive decrease since 2012.

Conclusions: The average cost for robotic gastric bypass surgery fell well below the average reimbursement within the Swiss DRG system between 2012 and 2014. As such, these robotic procedures can be viewed as a DRG winner in our setting for the analyzed years. However, the Swiss DRG system has only been in place since 2012, the first year of this analysis, which might cause flaws in the cost determination due to immaturity. As a matter of fact, adjustments using cost data with a three-year lag suggest that reimbursement will decrease in the future. As such, new DRGs have been assigned for gastric bypass surgery patients in the year 2015 resulting in grossly a different reimbursement structure for this population with a DRG split for standard gastric bypasses and more complex cases. 2015 cost data will be published as soon as it is available for analysis.

A5292

Relationships between fasting serum amylase and ghrelin, peptide YY3-36 levels in healthy men with obesity

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Objectives: Appetite and carbohydrate metabolism are important contributors to the development of obesity. Recently, low serum amylase was shown to be associated with obesity and metabolic disorder.

We investigated the relationship between amylase and ghrelin, peptide YY (PYY) levels in healthy men with obesity.

Methods: Twenty-one men with obesity were enrolled in this cross-sectional study; all subjects were asymptomatic with no medical history. Fasting serum amylase, ghrelin, PYY3-36, anthropometry and nutrition intake were measured. Linear regression analyses were performed to examine associations between amylase and ghrelin or PYY3-36.

Results: The mean age and waist circumference (WC) of the subjects were 51.5 ± 10.9 years, and 97.0 ± 4.4 cm. Amylase was found to be correlated with WC ($r = -0.438$, $P = 0.054$), ghrelin ($r = 0.533$, $P = 0.015$) and PYY3-36 ($r = -0.511$, $P = 0.021$). Multivariate linear regression analysis revealed a negative association between amylase and PYY3-36 ($\beta = -0.428$, $P = 0.045$), but a non-significantly positive association between amylase and ghrelin ($\beta = 0.260$, $P = 0.146$).

Conclusions: Amylase levels were found to be associated to ghrelin and PYY3-36 in healthy men with obesity. Amylase, ghrelin, and PYY3-36 may play role in obesity, further research is required to identify the underlying mechanism.

A5293

Benefits of robotic-assisted laparoscopic gastric bypass surgery among bariatric patients

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Objective: With the increasing popularity of using robotic assistants during weight loss surgery, few studies have compared these types of surgeries with non-robotic surgeries for patient outcomes in large national samples. There has been a vigorous debate within the bariatric surgical community on the utility, cost, and comparative effectiveness of robotic surgery when compared to traditional laparoscopic methods. The objective of this study was to compare robotically performed bariatric surgeries to those laparoscopically performed by using a nationwide administrative database.

Methods: We used a population with obesity (Body Mass Index ≥ 30) subsample of laparoscopic gastric bypass bariatric surgery visits from the Premier Healthcare Database from 2011-14. ICD-9-CM procedure codes were used to identify weight-loss

surgery subtype cases. Two outcomes (length of stay at hospital and total charge from the hospital) were compared between surgeries with robotic assistance and those without robotic assistance. Multivariable logistic regressions were used to control for patient age, gender, race, marital status, BMI, and Charlson Comorbidity Index (CCI).

Results: In our analysis subsample, there were 26,006 laparoscopic gastric bypass weight-loss surgeries, in which about 5.98% used robotic assistants. Compared with laparoscopic bariatric surgeries without robotic assistance, robotic surgeries were more used for older patients (46.3 vs 45.0, $p < 0.001$) and patients with higher CCI (2.35 vs 0.53, $p < 0.001$). An unadjusted comparison shows that the robotic-assisted surgeries had longer stay in hospital (2.74 vs 2.25, $p < 0.001$) and higher total charge (\$14,392 vs \$13,236) than those without robotic assistants. However, when we adjust for the patient characteristics in multivariate logistic regressions, robotic-assisted surgeries were associated with shorter length of hospital stay (-0.60 days, $p < 0.001$) and the lower medical cost (-\$1,978, $p < 0.001$).

Conclusion: The patients undergoing robotic-assisted gastric bypass surgeries tend to be older and have more comorbidity than those undergoing traditional non-robotic surgery. Our results suggest that using robots might help to reduce the length of stay and the total charge of the patients, although further analyses with more detailed patient information are needed to better understand the role of robotic assistants in gastric bypass surgery.

A5294

Hyperinsulinemic Hypoglycemia After Gastric Bypass Surgery

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Introduction: Neuroglycopenic symptomatology caused by hyperinsulinemic hypoglycemia following a RYGB is a rare but serious complication. It occurs only in the postprandial setting, distinguishing it from fasting hypoglycemia. Characteristically, this complication is seen years after the original operation. While reactive hypoglycemia is recognized as a component of dumping syndrome, in

some individuals this can be extreme. Workup and management of this condition has been variable. Potential treatments have ranged from dietary modifications, to medications, to more aggressive interventions including partial pancreatectomy.

Patient: A 46 year old female presented to clinic eight years status post a RYGB with a BMI of 31 and relatively recent symptoms consistent with neuroglycopenia. Her symptoms were first noted eight months prior to her presentation. She had characteristic complaints which included lethargy, confusion and fatigue ultimately culminating in the development of near syncopal episodes. The patient found the symptoms incapacitating, leading to limitations on her ability to work or operate a vehicle.

Methods: The workup began with a supervised 22 hour fast with glucose monitoring. She then underwent continuous blood glucose monitoring while at home. Medical management was attempted with acarbose, octreotide, diazoxide and liraglutide. Due to refractory symptoms, she underwent gastrostomy tube placement in the remnant stomach both to compare hormone profiles during meal tolerance tests and to provide enteral access. During these studies, we measured glucose, insulin, c-peptide and GLP-1. She subsequently underwent operative reversal of her RYGB. Postoperatively she was followed with glucose and symptom monitoring.

Results: During her supervised 22 hour fast there were no hypoglycemic spells documented. During continuous blood glucose monitoring in the outpatient setting, she had 15 episodes of documented hypoglycemia, with a recorded blood glucose of 44mg/dl. These hypoglycemic events were consistently preceded by episodes of hyperglycemia > 200 mg/dl. We then attempted medical management with acarbose, octreotide, diazoxide and liraglutide, all of which had minimal effect. Following remnant gastrostomy tube placement, she underwent mixed meal tolerance tests orally and via her gastrostomy tube. The oral meal led to a higher peak glucose at 30 minutes, and a lower nadir glucose at 90 minutes than the gastrostomy tube meal. Oral intake also coincided

with higher postprandial insulin and c-peptide levels, as well as GLP-1 levels (image 1). We also confirmed that oral intake of low sugar nutritional supplements did not lead to hypoglycemia. We offered the options of dietary modifications, with small frequent meals low in sugar and of reversal of the RYGB. The patient ultimately underwent reversal of her RYGB with immediate resolution of symptoms.

Discussion: It is important to distinguish hyperinsulinemic hypoglycemia after RYGB from other rare causes of profound episodic hypoglycemia. The workup for this condition should be algorithmic and expeditious in order to minimize patient morbidity resulting from neuroglycopenic symptoms. A supervised fast helps determine the necessity of further workup to rule out pathology unrelated to RYGB. One should then consider outpatient continuous blood glucose monitoring; the observation of hyperglycemic episodes followed by reactive hypoglycemia confirms the diagnosis. This reproducible pattern suggests that mixed meals, more specifically high sugar intake, leading to overproduction of GLP-1 are involved in the pathologic hyperinsulinemic state. The lack of GLP-1 augmentation and lack of post prandial hyperinsulinemia when high sugar supplements are fed into the remnant stomach suggest the primary problem is not due to abnormalities in beta cell mass or in the normal incretin response of ileal cells. We argue against routine pancreatectomy as a treatment. Instead, we propose the options of 1) dietary modifications, with small frequent meals high in protein and low in sugar; and 2) reversal of the RYGB. Eventual conversion to sleeve gastrectomy to help curb weight regain may be a future option in these patients.

A5295

Outcomes of barbed suture hiatal hernia repair during bariatric surgery – A single institution experience

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Introduction: Hiatal hernia (HH) is a common occurrence in bariatric patients. No agreement exists on the ideal technique of repair that should be used. The aim of this study is to assess the safety and outcomes of repairing a HH using a novel barbed suture technique during bariatric surgery.

Methods: From our total population of bariatric surgery patients between 2010 and 2014 we identified the ones with a HH diagnosed and divide them in 2 groups: repaired (Group 1) or not repaired (Group 2). Data collected included baseline demographics, perioperative parameters, postoperative outcomes and BMI.

Results: A total of 150 (13.2%) patients were diagnosed with a HH from the 1129 bariatric surgery population. The diagnosis of the HH was made mainly preoperatively 61% (n=91). Of the HH diagnosed 56% were repaired (Group 1, N=85) and 44% were not repaired (Group 2, N=65). The decision to close the HH was more common during a revision procedure ($p < 0.01$) compared to a primary procedure. Mean operative time was significantly higher when closing a HH: 104 minutes versus 73 minutes ($P < 0.01$). Comparing only primary procedures length of stay was 2.92 days in Group 1 and 2.72 days in Group 2 ($p = 0.20$). Readmission rate was comparable in both group. Overall postoperative complication rates (<30 days) were not significantly different. %EBMIL and BMI loss was no statistically difference.

Conclusion: Closing a HH during a bariatric surgery utilizing barbed sutures could add a technical benefit to the surgeon and it appears to be a safe and feasible approach not related to an increase in perioperative complications, readmission rates or length of stay.

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