

# **2019 Abstracts**

## **34<sup>th</sup> Annual Meeting of the American Society for Metabolic and Bariatric Surgery**

Presented at  
**ObesityWeek 2019**

November 3 – 7, 2019  
Mandalay Bay Resort  
Las Vegas, NV



## **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 ObesityWeek**

ObesityWeek 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.

## **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 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 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 (ASMBS) 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 32 AMA PRA Category 1 Credit(s)<sup>TM</sup>

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

Nursing Credits (up to 33.5 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 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.

**Top Paper Session I**  
**Tuesday, November 5, 2019**  
**10:15 AM – 12:00 PM**

**A101**

**Individualized Diabetes Complications Risk Scores: Future Risk of Diabetes End-Organ Complications with and without Metabolic Surgery**

Ali Aminian *Pepper Pike OH*<sup>1</sup>, Alexander Zajichek *Cleveland OH*<sup>1</sup>, David Arterburn *Seattle WA*<sup>2</sup>, Stacy Brethauer *Columbus OH*<sup>3</sup>, Steven Nissen *Cleveland OH*<sup>1</sup>, Philip Schauer *Cleveland OH*<sup>1</sup>, Michael Kattan <sup>1</sup> *Cleveland Clinic*<sup>1</sup> *Kaiser Permanente*<sup>2</sup> *Ohio State University*<sup>3</sup>

**Background:** Our aim was to construct predictive models to estimate the risk of long-term end-organ complications and death in patients with type 2 diabetes (T2DM) and obesity who are considering bariatric surgery.

**Methods:** On a cohort of 288,692 patients with T2DM in the Cleveland Clinic Health System between 2004-2017, 2287 patients with obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) who underwent bariatric surgery were matched 1:5 resulting in 11435 control patients based on the index date, age, gender, BMI, site, insulin use, and presence of diabetes complications with follow-up through December 2018. Multivariable time-to-event models were built and internally validated using 5-fold cross-validation to predict the 7-year risk for 5 outcomes of interest.

**Results:** The prediction tools demonstrated the following discrimination ability based on the cross-validated time-dependent area under the curve (1=perfect discrimination, 0.5=coin flip) averaged over the years 5-7 for the 5 outcomes in the surgical and control groups respectively: all-cause mortality (0.77 and 0.78), coronary artery disease (0.66 and 0.69), cerebrovascular event (0.72 and 0.61), heart failure (0.79 and 0.78), and nephropathy (0.80 and 0.81). The Individualized Diabetes Complications (IDC) Risk Scores were integrated into user-friendly web and smartphone applications for clinical use. When a patient's data is entered into the application, it calculates the 7-year morbidity and mortality rates with and without undergoing bariatric surgery.

**Conclusions:** The IDC Risk Scores can provide a strong evidence-based message for patients about their future health outcomes, based on their current status of obesity, T2DM, and metabolic disease with and without having bariatric surgery.

**A102**

**Metabolic Surgery prevents Systolic Heart Failure and reduces mortality due to recurrent-myocardial infarction in patients with history of Coronary Artery Disease: a nationwide case-control analysis**

David Romero Funes *Weston FL*<sup>1</sup>, Camila Ortiz Gomez *Weston FL*<sup>1</sup>, Juliana Henrique *Weston FL*<sup>1</sup>, Lisandro Montorfano *Weston FL*<sup>1</sup>, David Gutierrez Blanco *Weston FL*<sup>1</sup>, Emanuele Lo Menzo *Weston FL*<sup>1</sup>, Samuel Szomstein *North Miami Beach FL*<sup>1</sup>, Raul Rosenthal *Weston FL*<sup>1</sup> *Cleveland Clinic Florida*<sup>1</sup>

**Background:** Coronary artery disease (CAD) is the number one cause of death in America and the primary cause of systolic heart failure (SHF), subset of Heart failure (HF) with the most unfavorable prognosis. The objective of this study is to determine the impact of bariatric surgery in the prevention of SHF and mortality due to recurrent-MI in patients with history of CAD.

**Methods:** National inpatient sample (NIS) data collected between 2010 and 2014 was examined. We included all patient with history of CAD. The patients were classified as case and control-groups. Case-subjects were defined as patients that underwent bariatric surgery, and control-subjects as patients with BMI  $\geq 35$  without Bariatric surgery. A Multivariate logistic regression model was performed to assess the differences in SHF and fatal-MI between case and control-groups. All percentages and means (SE) were weighted.

**Results:** A total of 87,305 patients with history of CAD (79,091 controls and 8,214 cases) were included in the analysis. We observed that among patients with history of CAD, patients in the control-group were almost two times more likely to develop SHF when compared to the Case-group (OR=1.87, 95%CI 1.69-2.07,  $p < 0.0001$ ). Furthermore, this analysis revealed that patients in the control-group were two times more likely to experience a recurrent and fatal-MI compared to the case-group (OR=2.49, 95%CI 1.01-6.13  $p = 0.0482$ ).

**Conclusions:** Our findings suggest for the first time, that in patients with a higher cardiovascular risk (CAD) than the average population, bariatric surgery could prevent the development of SHF and remarkably reduce recurrent-MI mortality.

## A103

### Long-Term Outcomes of Single Anastomosis Duodeno-ileal Bypass with Sleeve Gastrectomy

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Bariatric Medicine Institute<sup>1</sup> Bariatric Medical Institute<sup>2</sup>

**Background:** The long-term outcomes of single anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S) have never been reported in the literature.

**Aim:** The aim of the study was to evaluate the long-term outcomes following SADI-S.

**Setting:** Single private institute, United States.

**Methods:** Data from 626 patients who underwent a primary laparoscopic SADI-S from June 2013 through March 2019 by three surgeons were retrospectively analyzed.

**Results:** Six hundred and twenty-six patients were included in the study. The mean age and preoperative body mass index (BMI) were  $46.3 \pm 12.9$  yrs. and  $49.5 \pm 8.8$  kg/m<sup>2</sup>, respectively. The average operative time and length of stay were  $65.4 \pm 8.3$  mins and  $1.6 \pm 0.8$  days, respectively. One hundred and eight patients were out five years. The overall intraoperative, short-term, and long-term complication rates were 0.3%, 6.3%, 8.1%, respectively. At five years, the DM, HLD, HTN, OSA, and GERD resolution rates were 79% 68.2%, 63.7%, 60%, and 52.7%, respectively. The ending mean weight and BMI were  $188.3 \pm 41.5$  lbs and  $30.5 \pm 6.5$

kg/m<sup>2</sup>, respectively. The mean %EWL and %TWL at five year were 79.3 ± 25 and 35.9 ± 10.4, respectively. The mean change in BMI was 17.4 ± 6.4 kg/m<sup>2</sup>. The overall mortality rate was 0.4%.

**Conclusions:** Laparoscopic SADI-S is effective in achieving weight loss and in improving comorbidities.

#### A104

##### **Long-Term Cost-Effectiveness of Bariatric Surgery vs Conventional Treatment in Swedish Obese Subjects By Baseline Glycemic Status**

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Karolinska Institutet<sup>1</sup> Sahlgrenska Academy<sup>2</sup> National Institute for Health & Welfare<sup>3</sup>

**Background:** Bariatric surgery is associated with an initial economic investment and results in health benefits over time. The aim of this study was to estimate the cost per life-year for bariatric surgery versus conventional obesity treatment in patients with euglycemia, prediabetes or diabetes at baseline.

**Methods:** The Swedish Obese Subjects (SOS) study is a prospective, nonrandomized, controlled intervention trial including 2010 adults who underwent bariatric surgery and 2037 contemporaneously matched controls recruited between 1987 and 2001. Surgery patients underwent gastric bypass (13%), gastric banding (19%), or vertical-banded gastroplasty (68%). Controls received conventional obesity treatment. The outcome was cost per life-year over up to 28y of follow-up including in- and outpatient care costs, prescription drug costs, and mortality retrieved from nationwide registers. Analyses were by intention to treat.

**Results:** During follow-up the surgery group accumulated higher total costs but also more life-years compared to conventional treatment. This resulted in incremental cost-effectiveness ratios of \$41,000 per life-year gained in patients with euglycemia, \$35,000 per life-year in patients with prediabetes, and \$2400 per life-year in patients with diabetes at baseline. In the subgroup of patients with newly diagnosed diabetes at baseline (<1y), bariatric surgery was dominant resulting in lower costs and more life-years gained.

**Conclusion:** Bariatric surgery resulted in more life-years gained at low additional cost compared to conventional treatment. In patients with newly diagnosed diabetes, bariatric surgery was cost-saving and resulted in more life-years gained compared to standard treatment.

#### A105

##### **Is it Worth it? Determining the Health Benefits of Sleeve Gastrectomy in Patients with a Body Mass Index Less than 35 kg/m<sup>2</sup>**

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Michigan Medicine<sup>1</sup> University of Michigan<sup>2</sup>

**Introduction:** Sleeve gastrectomy (SG) is not covered for patients with a body mass index (BMI)<35 kg/m<sup>2</sup>. Our goal was to determine if these patients experience the same health benefits when compared to patients with a BMI>35 kg/m<sup>2</sup>.

**Methods:** Using a statewide bariatric-specific data registry, we identified all patients with a BMI<35 kg/m<sup>2</sup> who underwent primary SG (n=333) between 2006 and 2017. Patient characteristics, 30-day risk adjusted complication rates and patient reported outcomes were compared to those who underwent a SG with a BMI>35 kg/m<sup>2</sup> during the same time period (n=41,172).

**Results:** BMI<35 kg/m<sup>2</sup> patients were more likely to be older (48.8 years vs 45.5 years, p<0.0001), female (86.8% vs 77.9%, p=0.0001) and have hyperlipidemia (53.8% vs 45.5%, p=0.0024), when compared to BMI>35 kg/m<sup>2</sup> patients. Overall complication rates were comparable (6.9% vs 5.2%, p=0.1756) as were discontinuation of medications for hypertension (55.8% vs 53.9%, p=0.7345), hyperlipidemia (51.9% vs 52.6%, p=0.9266) and diabetes (oral, 85.7% vs 78.1%, p=0.2326; insulin, 52.2% vs 62.4%, p=0.3173). BMI<35 kg/m<sup>2</sup> patients were more likely to achieve a normal BMI (ie. BMI<25 kg/m<sup>2</sup>) (40.7% vs 6.7%, p<0.0001) and also had higher psychological well-being scores (77.9 vs 73.0, p=0.0012), body image scores (52.0 vs 42.6, p<0.0001) and satisfaction rates (90.9% vs 84.6%, p=0.0405).

**Conclusions:** Low BMI patients were more likely to achieve a normal body weight, have better quality of life and satisfaction after SG. In addition, rates of patient reported resolution of metabolic disease remains high (>50%). Lowering the BMI threshold for sleeve gastrectomy should be considered.

## A106

### **Gastroesophageal reflux disease in patients with severe obesity and type 2 diabetes one year after sleeve gastrectomy or Roux-en-Y gastric bypass. A randomized controlled trial.**

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**Background:** To compare the effects of sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) on gastroesophageal reflux disease (GERD) one year after surgery.

**Methods:** Patients with type 2 diabetes and severe obesity were included in the triple blinded randomized *Obesity surgery in Tønberg (Oseberg)* trial (2013-2018) and randomly allocated to SG or RYGB. GERD-symptoms, esophagitis and pathological acid reflux were assessed with the Gastrointestinal Symptom Rating Scale (GSRS) questionnaire where a reflux score ≥20 was defined as marked reflux symptoms, esophagogastroduodenoscopy (Los Angeles Classification), and 24-hour pH-monitoring (DeMeester score cut-off ≥14.72), respectively.

**Results:** A total of 109 patients (69 female), mean (SD) age 47.6 (10.4) years and BMI 42.3 (5.2) kg/m<sup>2</sup>, were randomized and allocated in a 1:1 ratio to SG (n=55) or RYGB (n=54), and 93 patients (85%) completed 1-year follow up. At 1-year, the proportion of patients with GSRS  $\geq$ 20 was 16% and 4% in the SG and RYGB group, respectively (p=0.046). The prevalence of erosive esophagitis was 49% versus 34%, respectively (p=0.15). The prevalence of de novo-esophagitis was higher in the SG-group, 47% versus 13%, p=0.017. The mean (SD) DeMeester score was higher in the SG-group than in the RYGB-group 23 (27) versus 10 (15), p=0.008, and the proportion of patients with pathological acid reflux was higher in the SG-group, 49% versus 15%, p=0.001.

**Conclusions:** One year after surgery, patients who underwent SG had significantly higher prevalence of GERD-symptoms, pathological acid reflux and de novo esophagitis than those who underwent RYGB.

#### A107

##### **Association between weight loss and serum biomarkers with risk of incident cancer in the Longitudinal Assessment of Bariatric Surgery cohort**

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**Background:** Bariatric surgery reduces the risk of cancer in populations with obesity. It is unclear if weight loss alone or physiologic changes related to bariatric surgery cause this protective effect. We evaluated the relationship between surgical weight loss and changes in serum biomarkers with incident cancer in a bariatric surgery cohort.

**Methods:** The Longitudinal Assessment of Bariatric Surgery 2 is a prospective multi-center cohort (N = 2353, 79% female, mean age at baseline = 46). We evaluated weight and serum biomarkers, measured preoperatively and one year after surgery, as predictors for incident cancer. Associations were determined using Cox proportional hazards models adjusting for age, sex, education, and smoking history.

**Results:** Over 8759 person-years of follow-up, 82 patients reported new cancer diagnosis (936 per 100,000 person-years, 95%CI: 749–1156), 55 were cancers thought to be associated with obesity. Achieving a BMI < 30 kg/m<sup>2</sup> was associated with a lower risk of cancer (HR=0.59, 95%CI: 0.34–1.00), as was losing at least 20-34.9% total body weight (vs <20%, HR=0.44, 95%CI: 0.25–0.76). Baseline BMI  $\geq$  50 kg/m<sup>2</sup> (vs BMI <40kg/m<sup>2</sup>) was associated with more incident cancer (HR=1.40, 95%CI: 0.68-2.86). Decreased post-operative glucose, proinsulin, insulin, and leptin levels were association with decreased cancer risk (Table 1).

**Conclusions:** Achieving cancer-risk reductions through bariatric surgery may require losing >20% total body weight or lowering BMI below the obesity threshold. Surgery may not decrease cancer risk in patients with baseline BMI  $\geq$  50 kg/m<sup>2</sup>. Metabolic changes after bariatric surgery likely play a role in the decreased risk of cancer.



## A108

### **Does Bariatric Surgery prevent cancer in the obese population? A nationwide case-control analysis**

Camila Ortiz Gomez *Weston FL*<sup>1</sup>, David Romero Funes *Weston FL*<sup>1</sup>, Juliana Henrique *Weston FL*<sup>1</sup>, Joel Frieder *Weston FL*<sup>1</sup>, David Gutierrez Blanco *Weston FL*<sup>1</sup>, Emanuele Lo Menzo *Weston FL*<sup>1</sup>, Samuel Szomstein *North Miami Beach FL*<sup>1</sup>, Raul Rosenthal *Weston FL*<sup>1</sup>  
Cleveland Clinic Florida<sup>1</sup>

**Introduction:** According CDC's latest report, overweight and obesity-related cancers accounted for 40% of all malignancies diagnosed in 2014. The aim of this study is to determine the impact of bariatric surgery (BS) in the prevention of cancer in patients with obesity.

**Methods:** The National inpatient sample (NIS) data collected between 2010 and 2014 was examined. Patients with previous diagnosis of cancer were excluded from the analysis. The population was classified as case and control-group. Case-subjects were defined as patients who underwent BS and control-subjects as patients with BMI  $\geq 35$  who did not undergo BS. A Multivariate logistic regression model was performed to assess differences between case and control-group and adjust for independent variables as smoking-history and family-history-of-malignancy. All percentages and means (SE) were weighted.

**Results:** A total of 1,670,035 patients (1,423,367 controls and 246,668 cases) were included in the analysis. Patients without BS and with BMI  $\geq 35$  were significantly more likely to experience cancer compared to patients who did not undergo BS (Adjusted OR = 1.21,  $p < 0.0001$ ; Unadjusted OR = 1.35,  $p < 0.0001$ ). Interestingly, we observed that patients with genetic predisposition to breast cancer and BMI  $> 35$  who did not undergo BS, had almost 2.5 times higher rate of breast malignancy compared to patients with same predisposition in the case-group (18.0%,  $n = 28$  vs. 7.4%,  $n = 3$ ,  $p = 0.0991$ ).

**Conclusions:** Our findings suggest BS could significantly prevent the development of cancer in patients with higher risk than the average population. Additionally, to the best of our knowledge, this is the first study suggesting BS could decrease the rate of breast cancer in genetically-predisposed patients. Prospective studies in patients with genetic predisposition to breast cancer are needed to further assess this finding.

## A109

### **The Prevalence of Thrombophilia Disorder in a Diverse Group of Patients Seeking Laparoscopic Sleeve Gastrectomy; Utilizing Extended Chemoprophylaxis to Decrease the Rate of Portal Vein Thrombosis Postoperatively**

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**Background:** Portomesenteric vein thrombosis (PMVT) is a known complication after laparoscopic sleeve gastrectomy (LSG). Previous studies have indicated that many of these patients may have an undiagnosed thrombophilia. We recently changed our practice to check

thrombophilia panel on every patient preoperatively undergoing LSG. The purpose of this study is to 1) estimate the prevalence of thrombophilia in patients seeking LSG and 2) determine if extended chemoprophylaxis post-LSG reduces PMVT.

**Methods:** Thrombophilia panels were drawn on every patient seeking LSG after July 2018 at two high-volume bariatric surgery centers. A positive thrombophilia panel included: Factor VIII>150%, Protein C<70%, Protein S<55%, and Anti-thrombin<83%.

Patients with positive thrombophilia panel were discharged on extended chemoprophylaxis. PMVT rates for all LSG performed from Jan 2014 thru July 2018 (no routine preop thrombophilia panel) were compared to PMVT rates after July thru March 2019 (routine preop thrombophilia panel).

**Results:** 1075 patients seeking LSG had thrombophilia panel checked preoperatively. The cohort was 83% female, 84% Hispanic and 15% non-Hispanic African American; mean age and BMI were 39.2 years and 43 kg/m<sup>2</sup>, respectively. 577/1075 (54%) had abnormal thrombophilia panel preoperatively, including Factor VIII elevation (89.4%), Anti-thrombin III deficiency (5.9%), Protein S deficiency (2.9%), and Protein C deficiency (2.5%).

Between January 2014 and July 2018, 18 PMVT were diagnosed among 4228 LSG (0.4%). After July 2018, 1 PMVT was diagnosed among 745 LSG (0.1%) who had thrombophilia panel checked preoperatively.

**Conclusions:** The estimated prevalence of thrombophilia is 54% in this patient population. Extended prophylaxis may decrease PMVT post-LSG.

## A110

### **Efficacy of liposomal bupivacaine versus bupivacaine in port site injections on postoperative pain within enhanced recovery after bariatric surgery (ERABS) program; A Randomized Clinical Trial.**

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UCSF Fresno/ALSA<sup>1</sup> Fresno Heart and Surgical Hospital, CA<sup>2</sup>

**Background:** Use of liposomal bupivacaine (Exparel®) in surgery is reported with decreased postoperative opioid requirements. The efficacy of liposomal bupivacaine versus standard bupivacaine injections at laparoscopic port sites during bariatric surgery is unknown.

**Methods:** To determine whether there was difference in post-operative hospital opioid requirements after port site injections of liposomal bupivacaine versus standard bupivacaine during laparoscopic bariatric surgeries. Opioid use converted to morphine equivalent units (MEU) with secondary end points including home opioid use, pain scores, length of stay and adverse events. Setting: Academic-affiliated private practice.

2-group randomized, double blinded trial from November 2017- August 2018 with patients

randomly assigned to receive either liposomal bupivacaine(LB) or bupivacaine alone at trocar site injections during laparoscopic roux-en-Y gastric bypass (RYGB) or vertical sleeve gastrectomy (VSG).

**RESULTS:** 179 of 231 patients (77%) completed the trial, randomized into LB (n= 89) and bupivacaine alone (n=90) groups. There was no significant difference in postoperative MEU as described in Table 2. There were more patients in the bupivacaine group that did not take pain medications on postoperative day 2-4 ( $p<0.05$ ).

**CONCLUSIONS:** Among patients undergoing primary bariatric surgery under ERABS protocol, there was no significant difference in postoperative hospital opioid use in those receiving liposomal bupivacaine compared to standard bupivacaine. A greater percentage of patients in the standard bupivacaine group did not require any narcotics at home. In order to minimize opioid use after bariatric surgery, resources should focus on multimodal approaches instead of reliance on anesthetic medication used.

**Trial Registration:** [clinicaltrials.gov](https://clinicaltrials.gov) Identifier: NCT03196505

#### A111

#### **Impact of Enhanced Recovery After Bariatric Surgery (ERAS) on Patient Experience, Surgical Outcomes and Healthcare Costs: Electronic Medical Records (EMR) and Highmark Health claims data analysis.**

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Allegheny Health Network<sup>1</sup> AHN<sup>2</sup> Highmark Health<sup>3</sup>

**Background:** ERAS is a multimodal protocol minimizing peri-operative physiological changes through multimodal analgesia and post-operative nausea/vomiting prophylaxis, blood sugar control and goal directed fluid therapy along with peri-operative optimization of co-morbidities. We evaluate the impact of ERAS on patients' experience, surgical outcomes and healthcare costs.

**Methods:** A retrospective evaluation of commercial Highmark Health claims and a tertiary care center EMR for patients (>18 years old) undergoing an initial gastric bypass or sleeve (CPT: 43644, 43775) between 01/2017 - 12/2018. ERAS was implemented within a single hospital beginning 02/2018. Inpatient Press-Ganey survey scores along with demographics, clinically relevant intra-, post-operative indicators such as medication, complications, length of stay and scaled claims costs were evaluated.

**Results:** EMR (n=893) and claims (n=8051) data were combined resulting in 8,391 unique patients. ERAS patients (n=347) were not significantly different in age, gender, or BMI ( $p>0.3$  for all) when compared to No ERAS (n=8044). ERAS patients experienced a decrease in length of stay (ERAS v No ERAS: 1.7(0.6) v 2.0(0.7),  $p<0.0001$ ), number of nausea medications dispensed (7(6-8) v 4(3-5),  $p<0.0001$ ), decrease in 30-day post-op complications (EMR: n=35 v n=50,  $p=0.6$ ) including ER dehydration episodes. Inpatient Press-Ganey scores improved:

hospital rating (57% to 70%). Additionally, using payor claims data , there was a 1.3x decrease in total cost for the surgery (p<0.0001).

**Conclusions:** Our findings reveal the implementation of a multi-modal ERAS program in Bariatric Surgery provides true value to healthcare with significant benefits at the patient, hospital, and payors level.

## A112

### **Estimated Exercise Workload is a Predictor for Emergency Department Visits Following Bariatric Surgery**

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**Background:** Peak functional capacity is an independent predictor of mortality and preoperative-surgical risk. We sought to examine the relationship between estimated exercise training workload and complications after bariatric surgery.

**Methods:** Patients who participated in an exercise class prior to bariatric surgery at a single institution between January 2015 and June 2018 were included in the analysis. Exercise was led by a clinical exercise physiologist who guided exercise intensity based on patient perceived exertion. Workloads performed on a treadmill or a seated recumbent stepper (i.e., NuStep) were converted to metabolic equivalents of task (METs) using validated equations. An odds ratio (OR) was calculated to predict if exercise METs were related to the following events: emergency department (ED) visits, hospital readmission, length of stay, or surgical complications.

**Results:** 684 patients were included in the analysis (age = 45 ± 10 yr; BMI = 47 ± 7 kg/m<sup>2</sup>). The majority of patients were female (84%) and underwent sleeve gastrectomy (73%). 57 events were observed (8.3%), the majority of which were 30-day ED visits (44 events). Estimated METs during exercise training were predictive of both overall events, as well as 30-day ED visits (Table). After adjustment, METs remained predictive of 30-day ED visits. Values below 2.7 METs were related to the highest risk.

**Conclusion:** Higher exercise METs levels prior to bariatric surgery were predictive of lower 30-day ED visit rates, with each 1 MET increase associated with a 48% reduction in risk. Pre-operative exercise training workload may help further stratify surgical risk.

## A113

### **Predictive value of CRP for early complications, re-operations and re-admission after bariatric surgery**

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**Background:** C-reactive protein (CRP) has previously been shown to be a predictive factor for complications after gastric bypass surgery. The present study aimed at identifying cut-off values for CRP on the first postoperative day (POD1) to predict early complications, re-operations and re-admission within 30 days after various bariatric procedures.

**Methods:** Retrospective analysis of CRP-values after gastric bypass, sleeve gastrectomy and duodenal switch in a single center institution between 2012 and 2017. The unit of CRP was mg/l (ref < 5). Cut-off values were calculated by ROC-analysis.

**Results:** 885 patients were included in the study. 30-day follow-up rate was 94%. The rate of early complications was 5.8%, the rate of re-operations 2.7%, and rate of re-admissions was 5.7%. CRP-values at POD1 were significantly higher in patients with early complications, re-operations and re-admission within 30 days. The cut-off value was calculated to be 27 mg/l for CRP at POD1 giving a negative predictive value of 97% for early complications, 99% for re-operations and 96% for re-admission. A CRP-value higher than 27 mg/l was highly associated with early complications (OR 3.32; CI95%: 1.67 – 6.60, p=0.001), re-operations (OR 6.69; CI95%: 2.21 – 20.28, p = 0.001) and re-admission within 30 days (OR 4.11; CI95%: 2.15 – 7.76, p<0.001) in a multivariate regression model.

**Conclusion:** The CRP-value on the first postoperative day is highly predictive for early complications, re-operations and re-admission regardless the type bariatric surgery. These results offer the opportunity to custom-tailor the postoperative care of bariatric patients even in an outpatient setting.

#### A114

##### **Long-term outcomes of bariatric surgery in patients with cirrhosis.**

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**Introduction:** Cirrhosis is associated with increased risks of bariatric procedures. Long-term risks and benefits of bariatric procedures in cirrhotic patients are not well documented. The aim of this study was to assess whether presence of cirrhosis at the time of bariatric surgery was associated with adverse long-term outcomes.

**Methods:** A cohort of 26 biopsy proven, single surgeon's, cirrhotic patients were studied. Medical notes were retrospectively assessed for patient characteristics, 30-day postoperative complications, length of stay and, long-term mortality and liver function. The results are presented as median and interquartile range.

##### **Results:**

Our cohort consisted of 14M:12F, age 52 years (45-58), BMI 46 kg/m<sup>2</sup> (41-51), MELD score 7 (7-8). Majority of patients were Child-Pugh A (88%, 23/26). A significant proportion of patients suffered from T2DM and metabolic syndrome (85% and 96%, respectively). Operations performed were LRNYGB 15, LSG 7, LAGB 1. 3 patients were abandoned due to unexpected intraoperative findings of portal hypertension.

There was no perioperative mortality, length of stay was 7 days (7-8) and, 12% (3/26) patients developed significant complications (Clavien-Dindo class  $\geq 3$ ).

With median follow-up of 52 months (28-85), there was no long-term gross or liver related mortality or decompensation of liver cirrhosis, respectively. MELD score as proxy of liver function suggest no significant deterioration during long-term follow-up (pre-op MELD 7 vs 6 (17/26) post-op).

**Conclusion:** Patients with well compensated cirrhosis tolerate range of bariatric procedures with perioperative and long-term mortality and cirrhosis related decompensation being rare.

## A115

### **Is Bariatric Surgery Safe in Patients with History of Cardiac Revascularization?**

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**Background:** The number of patients undergoing bariatric surgery(BS) with prior cardiac revascularization(CR) is rising. However, scarce data exists regarding the safety of bariatric procedures in these patients. We aim to compare postoperative cardiovascular and non-cardiovascular outcomes among patients with different CR procedures.

**Methods:** We retrospectively reviewed 2884 patients undergoing BS from 2009 to 2018. Patients with prior CR were included and stratified into groups: Coronary Artery Bypass Graft(CABG), Percutaneous Coronary Intervention with Stent(PCI) and CABG+PCI. We described patient demographics, comorbidities, smoking status, history of myocardial infarction, type of BS, number of vessels grafted/stented, time from CR-to-BS, length of stay, as well as cardiovascular and non-cardiovascular 30-day and 2-year outcomes. T-test and Chi-Square were performed for continuous and categorical variables, respectively.

**Results:** We identified 76 patients with prior CR undergoing BS. The mean patient age was  $61.45 \pm 7.92$  years-old and the mean body mass index was  $41.79 \pm 6.55$  kg/m<sup>2</sup>. Predominant gender was male(71.1%). Among these, 50%(n=38) had PCI, 39.47%(n=30) had CABG, and 10.53%(n=8) had CABG+PCI. Early cardiovascular complications rate was 11.84%(n=9) and included ST-segment-elevation myocardial infarction(n=2), pulmonary embolism(n=1), supraventricular arrhythmia(n=2), ventricular arrhythmia(n=1), pacemaker/defibrillator-insertion(n=1), and chest pain(n=2). Early non-cardiovascular complications rate was 10.53%(n=8). Comparison between groups did not show statistically significant difference, regarding complications( $p > 0.05$ ). We also appraised the ACSNSQIP risk calculator for better understanding of the scrutiny. Percentage of patients comprising the original group who completed the 2-year-follow-up was 23.68%. Mortality rate was 0%.

**Conclusions:** Although revascularized patients have severe comorbidities, bariatric surgery remains safe, when complication rates are compared to literature reported outcomes.

## A116

### **High Rates of Smoking Relapse and Ulcer Development following Laparoscopic Roux-en-Y Gastric Bypass (LRYGB)**

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**Introduction:** Given that smoking is known to contribute to gastrojejunal anastomotic (GJA) ulcers, cessation is mandated prior to LRYGB. however, relapse rates and exact ulcer risk are unknown. We aimed to define smoking relapse and risk of GJA ulceration after RYGB.

**Methods:** Our institutional MBSAQIP database was reviewed from 2014 to 2018 to identify patients who quit smoking within one year prior to undergoing LRYGB. Smoking relapse rate, and GJA ulcers of these former smokers were recorded postoperatively and compared to a 3:1 matched control group of nonsmokers or remote quitters (>1 year prior to surgery). In addition, GJA ulceration rates were compared between former smokers who relapsed after surgery, those who did not and the control group. GJA complications were identified based on endoscopic findings or need for reoperations.

**Results:** A total of 160 patients were analyzed. After surgery 30 of 63 former smokers (48%) relapsed versus only 1 of 97 (1%) matched controls. 71% of relapsed smokers developed GJA ulcers compared with only 9% of nonrelapsed former smokers and controls ( $p < 0.01$ ; table 1). Patients who developed GJA ulcers postop were more likely to require an intervention (Graham patch, GJ revision, endoscopic clips, etc) if they were smoking versus not (76% vs 50%, respectively;  $p = 0.13$ ).

**Conclusions:** Smokers relapse frequently after LRYGB and the majority experience GJA complications. They should be counseled about this risk preoperatively and directed towards less ulcerogenic procedures when possible. Alternatively, close monitoring or longer periods of preop smoking abstinence might be needed.

## A117

### **Rapid Weight-Loss Following Bariatric Surgery Improves Renal Function After Kidney Transplantation**

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**Background:** Bariatric surgery(BS) has been reported as feasible and safe in renal allotransplantation(RAT) patients. However, to the best of our knowledge, the benefits of bariatric procedures on kidney transplant outcomes have not been described in the literature. We aim to assess the beneficial impact of pre-transplant surgical weight-loss on graft function.

**Methods:** We retrospectively reviewed patients who underwent RAT from 2010 to 2018 at our

institution. Patients who had undergone BS pre-RAT(Group-A) were identified and compared to those who had RAT with pre-operative BMI $\geq$ 35(Group-B). Basic demographics, comorbidities, plateau renal function and time-to-plateau, post-RAT outcomes and 30-day complications were described and compared between groups. Estimated Glomerular Filtration Rate(eGFR) was calculated through the CKD-EPI equation. Patients who underwent RAT with a BMI<30 (Group-C) were used for reference.

**Results:** We identified n=7 patients in Group-A, n=51 in Group-B and n=42 in group-C. All groups were comparable by basic demographics and comorbidities(Table1). Post-RAT, eGFR stabilized faster in group-A than Group-B(5.83 $\pm$ 2.23 vs. 16.17 $\pm$ 11.12days;  $p=0.0303$ ). Group-A also achieved better plateau creatinine values(1.16 $\pm$ 0.17 vs. 1.42 $\pm$ 0.31;  $p=0.0372$ ) and eGFR(60.14 $\pm$ 9.34 vs. 56.23 $\pm$ 13.68;  $p=0.4216$ ). Delayed Graft Function(DGF) and graft-rejection rates were higher in Group-B(14.29%vs.25.49% and 0%vs.5.88%; respectively). Length-of-Stay and 30-day complication rate were also higher in Group-B. When comparing groups-A vs. C, no statistical difference was observed in any variables(Table2).

**Conclusions:** Pre-transplant BS has an overall positive impact on kidney allograft function. To the best of our knowledge, this is the first study reporting that BS seems to improve graft function and decrease time from RAT to plateau kidney function.

## A118

### **Impact of Urinary Catheter on Post-operative Urinary Complications After Roux en Y Gastric Bypass Surgery**

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**Background:** Urinary tract infection (UTI) is the 3rd most common post-discharge complication after bariatric surgery. Indwelling urinary catheter placement is a risk factor for developing UTI's in surgical patients. The purpose of the current study is to determine whether urinary catheter use in patients undergoing laparoscopic Roux-en-Y gastric bypass (RYGB) procedures has an effect on postoperative urinary complications, length of stay (LOS), and 30-day readmission rates.

**Methods:** The Geisinger Surgical Institute database was utilized to identify adult patients who underwent primary laparoscopic RYGB surgery. Primary outcomes included incidence of UTI within 30 days postoperatively, 30-day readmission rates, and LOS. These were compared between patients with and without urinary catheter placement.

**Results:** 1,143 patients met inclusion criteria. Urinary catheters were utilized in 274 patients (23.97%). Incidence of postoperative UTI was 1.1% in patients with a urinary catheter and 0.4% in patients without a urinary catheter ( $p=0.292$ ). The 30-day readmission rates for patients with and without a urinary catheter were 6.6% and 3.8%, respectively ( $p=0.053$ ). The proportion of patients discharged after post-operative day 1 was greater (47.1% vs 32.0%,  $p<0.001$ ) in patients



with a catheter.

**Conclusions:** The current study demonstrates that the incidence of UTI and readmission rates are low after laparoscopic RYGB and the non-use of indwelling urinary catheters does not have a significant impact on these outcomes. Yet, we recommend avoidance of urinary catheters in patients undergoing RYGB as they result in longer LOS and have the potential for greater economic cost.

**A119**

**OUTCOMES IN RACIAL COHORTS UNDERGOING ROBOTIC-ASSISED REVISIONAL METABOLIC AND BARIATRIC SURGERY: AN MBSAQIP MATCHED COHORT ANALYSIS**

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**Introduction:** Revisional Metabolic and Bariatric Surgery (R-MBS) is increasing performed in the Unites States. Between 2011 and 2017, rates increased from 6% to 14%. The robotic platform is also increasingly used. Little is known about perioperative outcomes in racial cohorts undergoing R-MBS. Our study goal was to evaluate outcomes following robotic R-MBS between racial cohorts.

**Methods:** From the 2015-2017 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database, we identified patients having a robotic-assisted R-MBS using the revision/conversion and surgical approach variables in the database. Included cases were further stratified by race. 1:1 case-control matching was performed of racial cohorts, comparing Black vs. White and Hispanic vs. White patients. Cohorts were matched by patient demographics and preoperative comorbidities.

**Results:** Of 2027 robotic-assisted R-MBS cases analyzed, 63%, 21%, 9% were performed in White, Black and Hispanic patients, respectively. After matched analysis (n = 850), outcomes between Black and White patients were similar, except for higher rates of organ space SSI (p = 0.045) and aggregate leak (p = 0.056) in Black patients. Outcomes were similar between matched (n = 392) White and Hispanics patients, except for a higher rate of aggregate bleeding (p = 0.044) in Whites. Overall and bariatric related morbidity were similar between racial cohorts (Table 1).

**Conclusions:** Robotic-assisted revisional metabolic and bariatric surgery is overall safe in racial cohorts, with little difference in perioperative outcomes. Further research is needed to understand reasons for higher rates of aggregate leak in Black patients and aggregate bleeding in White patients.

## A120

### **Safety of Roux-en Y gastric bypass in patients ages 65 and above compared to sleeve gastrectomy: propensity-score matched analysis of the MBSAQIP**

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**Background:** There are no clear recommendations for bariatric surgery in elderly population. Age is a risk factor for perioperative complications. Choice of procedure should be based on the balance of risk/benefits ratio. Objective: The aim of the study was to assess the safety of Roux-Y gastric bypass (RYGB) compared to sleeve gastrectomy (SG) in patients aged 65 years and above.

**Methods:** Preoperative characteristics and 30-day outcomes from the MBSAQIP data sets 2015-2017 were selected for all patients aged 65 years old and above who underwent RYGB or SG. The primary outcome was all-cause mortality. Secondary outcomes were: morbidity, reoperation, readmission, leak and bleed rates. Propensity score matching was used to control for potential confounding.

**Results:** Out of 34, 911 eligible patients, a total of 21, 500 patients were included in the study. The groups were closely matched as intended. RYGB in elderly patients was associated with higher risks of death (0.40% vs 0.18%; relative risk [RR], 2.63; 95% confidence interval [CI], 1.32 to 3.89, P=0.002), morbidity (6.80% vs 3.41%; RR, 1.99; 95% CI, 1.76 to 2.25, P<0.001), reoperation (3.48% vs 1.23%; RR, 2.83; 95% CI, 2.33 to 3.45, P<0.001), readmission (8.10% vs 4.20%; RR, 1.93; 95% CI, 1.73 to 2.15, P<0.001), leak (1.84% vs 0.72%; RR, 2.57; 95% CI, 1.98 to 3.34, P<0.001), and bleeding (3.00% vs 1.32%; RR, 2.27; 95% CI, 1.92 to 2.94, P<0.001).

**Conclusions:** RYGB in bariatric patients aged 65 years and above was associated with higher risk of death, morbidity, reoperation, readmission, leakage and bleeding.

## A121

### **Could the novel oral anticoagulant apixaban be the answer for extended venous thromboembolism (VTE) prophylaxis following bariatric surgery?**

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**Background:** The popularity of sleeve gastrectomy seems to have increased the risk of mesenteric venous thrombosis (MVT) and DVT/PE, necessitating identification of a safe, simple regimen for extended prophylaxis. Objectives: Evaluate the incidence of bleeding complications and VTE events among patients receiving apixaban for VTE prophylaxis post-op.

**Methods:** Beginning in 10/2016 in Utah and 1/2018 in NY, patients were prescribed apixaban 2.5mg twice daily for 30 days post-op starting post-op day (POD) 3. Pre-op VTE chemoprophylaxis for inpatients consisted of unfractionated heparin 5000-7500mg (Utah) or low

molecular weight heparin 30-40mg (NY). Post-op, prior to starting apixaban, all patients ambulated and were given intermittent pneumatic compression devices.

**Results:** 1847 patients were prescribed apixaban 2.5mg twice daily for post-op DVT prophylaxis. Of these, 3 bled immediately post-op before starting apixaban. After discharge on apixaban, 1 patient was re-admitted POD11 after laparoscopic RYGB for a hematoma near the remnant staple line (required IR drainage), and another patient was re-admitted for an intrauterine bleed (no transfusion). Patients reported cessation of the apixaban regimen prior to 30 days due to nose bleeds (n=2), heavy/prolonged menses (n=7), rashes (n=20), mood disturbance (n=1), & headache (n=1). No patients presented with clinically significant DVT or MVT, and only 1 patient who had been noncompliant with the apixaban regimen developed a PE.

**Conclusions:** These data suggest that apixaban 2.5mg twice daily for 30 days beginning POD3 is safe for VTE prophylaxis in post-bariatric surgery patients. Larger studies measuring for compliance are needed to confirm these exciting findings.

## A122

### **Laparoscopic Truncal Vagotomy combined with Surgical Resection for Perforated or Recalcitrant Marginal Ulcers**

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**Background:** Marginal ulcer is a common complication following laparoscopic gastric bypass operations for morbid obesity.

**Methods:** A retrospective chart review of patients who required surgical intervention for non-healing marginal ulcers or those presenting with perforated marginal ulcers were reviewed during the time period January 2013 through February 2019. In cases of recalcitrant marginal ulcers, persistent ulceration was present despite medical therapy and lifestyle changes. In cases where the patient presented with free perforation surgical intervention occurred at the time of presentation. Patients with recalcitrant marginal ulcers had preoperative EGD that demonstrated a recalcitrant marginal ulcer. Revision of the GJ anastomosis or resection of the marginal ulcer was done in all cases. Laparoscopic truncal vagotomy was performed following revision of the anastomosis or resection of the ulcer. We reviewed operative time, ulcer recurrence and complications in the 30 cases identified.

**Results:** 30 patients were identified who underwent revision/resection following presentation with a recalcitrant or free perforation of a marginal ulcer. Every patient underwent simultaneous truncal vagotomy at the time of operation. Complete truncal vagotomy was confirmed on frozen section at the time of operation. There were no 30 day mortalities. All patients had surgical drains placed. There were no leaks. All patients underwent followup endoscopy 3-6 months after resection/vagotomy. There were no recurrent marginal ulcers discovered. Follow up of 5 months to 6 years reveals no recurrent ulcers. There were no reoperations or major complications.

**Conclusions:** Laparoscopic Truncal Vagotomy appears to be safe and effective in the treatment of marginal ulcers.

**A123**

**Risk Factors for Surgical Site Infections after Laparoscopic Bariatric surgery: An Analysis of the MBSAQIP Database**

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**Background:** Surgical site infection (SSI) is a preventable postoperative complication. There is a paucity of literature on risk factors for SSI after bariatric surgery. The aim of this study was to evaluate risk factors for SSI after laparoscopic bariatric surgery using the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database.

**Methods:** Patients undergoing laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB) between 2015 and 2017 were identified from the MBSAQIP database. Descriptive analysis was used to evaluate associations between SSI and perioperative complications. Multivariate logistic regression analysis was used to identify predictors of SSI.

**Results:** A total of 266,791 LSG and 104,442 LRYGB cases were identified with 2494 (0.67%) total cases of SSI (1595 cases of superficial SSI; 211 cases of deep/incisional SSI; 715 cases of organ-space SSI). SSI was associated with an increased risk of complications (32.5% vs. 3.08%;  $p<0.01$ ) and mortality (0.52% vs. 0.07%;  $p<0.01$ ). LRYGB was associated with higher risk of SSI compared to LSG (AOR 2.52; 95% CI 2.31-2.76;  $p<0.01$ ). The most predictive risk factors for SSI were body mass index  $\geq 60$  kg/m<sup>2</sup> (AOR 1.71; 95% CI 1.33-2.21;  $p<0.01$ ) and steroid use (AOR 1.61; 95% CI 1.27-2.03;  $p<0.01$ ). Additional risk factors for SSI are listed in Table 1.

**Conclusions:** Despite low incidence, SSI after laparoscopic bariatric surgery is associated with perioperative morbidity and mortality. Modifiable risk factors such as diabetes mellitus, smoking, and steroid use may provide an opportunity to decrease SSI risk.

**A124**

**Rates of Revisional Surgery following Vertical Sleeve Gastrectomy and Roux-en-Y Gastric Bypass**

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CMAS

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**Introduction:** Vertical Sleeve Gastrectomy (VSG) is becoming an increasingly popular surgical treatment for morbid obesity compared to Roux-en-Y Gastric Bypass (RYGB) in North America. Few studies have looked at the rate of revision following those surgeries.

**Methods:** Data collected in the Ontario Bariatric Registry between 2010–2019 was used for this

retrospective study to determine conversion rates and reasons for revision for both surgeries. Revision rates were calculated using the available data at each follow-up year.

**Results:** Of 20,405 patients who underwent RYGB (17,455) or VSG (2,950), 302 had revisional surgery during the 5-year follow-up (168 RYGB, 134 VSG). In the VSG group, 22 (16.42%) underwent conversion to Duodenal Switch (DS) as part of a 2-stage planned procedure and were excluded from analysis. The rate of conversion in VSG increased at each follow-up and was significantly higher than RYGB after 1 year of follow-up ( $p < 0.05$ ).

In the VSG group, 75 (66.96%) revisions were performed due to weight regain or insufficient weight loss and 37 (33.04%) for complications. For the RYGB patients, 3 (2%) revisions were due to weight regain or insufficient weight loss and 165 (98%) were due to complications.

#### **Conclusion:**

The rate of revisional surgery increases over time in VSG, while it remains consistently low in RYGB. Most revisions of VSG are due to ineffective weight loss or weight regain, while the most common reason for RYGB revisions are complications.

#### **A125**

#### **LAPAROSCOPIC CONVERSION OF GASTRIC BYPASS TO DUODENAL SWITCH: 5 YEAR WEIGHT LOSS, COMORBIDITY OUTCOMES, AND COMPLICATIONS**

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Rex Bariatric Specialist<sup>1</sup> North Carolina Surgery/ Rex Bariatric Specialists<sup>2</sup>

**Introduction:** Weight recidivism and comorbidity recurrence after Roux-en-Y gastric bypass pose a perplexing challenge for bariatric surgeons. No proven or durable options exist among the various pouch, anastomosis, or limb length revisions. Conversion to duodenal switch demonstrates efficacy in small published series. However, technical complexity and inexperience limit broader acceptance. This study reviews our experience with laparoscopic conversion of gastric bypass to duodenal switch.

**Methods:** From January 2013 to December 2017, 54 patients underwent conversion to DS at a community hospital with at least 1 year follow-up. A retrospective analysis reviewed postoperative outcomes and complications.

**Results:** Mean age 51 years  $\pm$  10.6, mean BMI  $49 \pm 27.2$  kg/m<sup>2</sup>, mean length of stay  $2.4 \pm 0.8$  days. Early excess weight loss (EWL) equaled 49%, 66%, 70%, 65% at 6, 12, 18, 24 months, respectively, and midterm EWL 53%, 43%, 41% at 36, 48, 60 months, respectively. Major early complication rate of 12.9% (7), including bowel obstruction, persistent nausea, bleeding, liver abscess, and sleeve leak. No reported anastomotic leaks or 90 day mortality. While minor fat soluble vitamin deficiencies developed, none proved clinically significant. Two patients (3.7%) required feeding supplementation for protein deficiency and one limb lengthening. Type 2 diabetes mellitus, dyslipidemia, hypertension, and sleep apnea resolution equaled 90%, 78%, 32%, and 94%, respectively. Mean follow-up averaged 79%.

**Conclusion:** While technically challenging, conversion to duodenal switch offers an effective alternative for failed bypass, producing modest weight loss, excellent reversal of diabetes mellitus and hyperlipidemia, and acceptable complication rates.

#### A126

##### **Presence of liver steatosis is associated with greater diabetes remission after gastric bypass surgery**

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**Background:** Type 2 diabetes (T2DM) is characterized by insulin resistance (IR) and progressive decline in beta-cell function. Ectopic fat accumulation in liver and muscles damages the insulin-signaling cascade and causes IR. Since metabolic surgery significantly improves fatty liver disease, we hypothesized that coexistence of liver steatosis (i.e. when IR has a significant contribution in T2DM) would be associated with greater diabetes improvement after metabolic surgery.

**Methods:** A total of 526 patients with T2DM who underwent RYGB and simultaneous liver biopsy at an academic center in the United States (2004-2012) and had a minimum 5-year follow-up were analyzed to assess the impact the liver steatosis on diabetes remission (HbA1C <6.5% off medications).

**Results:** Long-term diabetes remission rate in patients with steatosis grade 0 (healthy, <5%), grade-1 (mild, 5%-33%), grade-2 (moderate, 34%-66%), and grade-3 (severe, >66%) was 39%, 50%, 56%, and 57% respectively (p=0.01). On multivariable analysis, controlled for baseline characteristics, presence of liver steatosis was an independent predictor of long-term diabetes remission (p=0.03). Presence of NASH and liver fibrosis at baseline were not predictors of diabetes remission.

**Conclusion:** This study, for the first time, suggests that in patients with T2DM who are considering metabolic surgery, coexistence of liver steatosis would be associated with a better long-term glycemic outcome. Furthermore, our data would suggest that there are different variants of T2DM whose metabolic response to surgical weight loss would be different. A subgroup of patients whose T2DM are characterized by presence of more peripheral IR would have better postoperative metabolic outcomes.

#### A127

##### **RYGB alters intestinal lipid metabolism and increases portal level of anti-diabetic phospholipids**

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**Background:** Roux-en-Y gastric bypass (RYGB) leads to intestinal morphology, characterized as hypertrophy and hyperplasia. We hypothesized that RYGB alters enterocyte lipid handling to support this increased bioenergetic demand. The subsequent release of novel lipid metabolites within the portal milieu send signals to the liver which mediates insulin sensitivity.

**Methods:** RYGB or Sham surgeries were performed in diet-induced obese and insulin resistant rats. Biliopancreatic, Roux, and common limb in RYGB rats with their respective counterparts in sham were harvested after fasting or feeding. qPCR was performed to determine intestinal mRNA expression levels of fatty acid (FA) uptake transporters and FA  $\beta$ -oxidation proteins. The micro-anatomy of the intestine was studied by transmission electron microscopy (TEM). Portal lipid metabolites were characterized using liquid chromatography coupled to mass spectrometry.

**Results:** At fasting, there was downregulation of FA uptake transporters and FA  $\beta$ -oxidation in enterocytes, with lowering of portal diglyceride and triglyceride levels. Portal long-chain phospholipids (phosphatidylcholine) were however increased. After feeding, there was a significant increase in gene expression for FA uptake and FA  $\beta$ -oxidation (table 1). TEM section of Rx limb showed lower number of lipid droplets and more mitochondria in RYGB rats.

#### **Conclusion:**

RYGB induces metabolic changes in enterocytes with increased mitochondrial density and lowering of lipid droplets. During fed state, there is an increase in enterocyte lipid metabolism which leads to unique changes in portal milieu. As long chain phospholipids are known to promote insulin sensitivity, we hypothesize that these changes are responsible for the rapid improvement in diabetes after RYGB.

#### **A128**

#### **The responsiveness and sensitivity of the Single Point Insulin Sensitivity Estimator (SPISE) after bariatric surgery**

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**Background:** Single Point Insulin Sensitivity Estimator (SPISE) has previously been shown to surrogate insulin-sensitivity comparable to HOMA-IR (homeostasis model assessment-insulin resistance). The present study aimed at analyzing changes of the SPISE-index after various bariatric procedures both in diabetic and non-diabetic patients.

**Method:** Retrospective analysis of the SPISE-index after bariatric surgery in a single center institution between 2007 and 2017. Diabetes mellitus (T2DM) was defined by medical treatment, fasting glucose  $> 7.0$  mmol/L or HbA1C  $> 48$  mmol/L. The SPISE-index was computed by the formula  $600 \times \text{HDL-C}^{0.185} / (\text{TG}^{0.2} \times \text{BMI}^{1.338})$  with higher values indicating higher insulin-sensitivity. Relative increase of the SPISE-index was calculated as SPISE-index after 2 years/SPISE-index preoperative.

**Results:** 2123 patients (T2DM in 19.5%) were included in the study with a 2-year follow-up rate of 65%. The SPISE-index was weakly negatively correlated to HbA1C ( $r=-0.3$ ;  $p<0.001$ ) and fasting glucose ( $r=-0.2$ ;  $p<0.001$ ). The pre-operative SPISE-index was significantly higher in the

non-diabetic group  $3.2\pm 0.7$  vs.  $2.9\pm 0.6$ ;  $p<0.001$ . Two years after bariatric surgery, resolution of T2DM was achieved in 69% of cases. The relative increase of the SPISE-index differed significantly comparing resolution, non-resolution and new onset of T2DM:  $2.1\pm 0.6$  vs.  $1.8\pm 0.5$ ;  $1.5\pm 0.3$ ;  $p<0.001$ . Duodenal switch was associated with the highest relative increase of the SPISE-index compared with gastric bypass or gastric sleeve ( $2.9\pm 0.7$  vs.  $2.0\pm 0.5$  vs.  $1.8\pm 0.4$ ;  $p<0.001$ ).

**Conclusion:** The SPISE-index is both responsive for bariatric surgery and sensitive for improvement in T2DM. Duodenal switch leads to higher relative increase of insulin-sensitivity than gastric bypass or gastric sleeve.

## A129

### **Comparison of Laparoscopic Sleeve Gastrectomy and Laparoscopic Roux-en-Y Gastric Bypass outcomes utilizing the ACS MBSAQIP**

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**Background:** Laparoscopic bariatric surgery has proven a safe and effective form of weight reduction in obese and morbidly obese patients. We present a query of national bariatric surgery data to investigate the efficacy of laparoscopic sleeve gastrectomy (LSG) as compared to laparoscopic Roux-en-Y gastric bypass (LRYGB).

**Methods:** Patients were identified from the 2016 American College of Surgeons Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (ACS-MBSAQIP). Laparoscopic sleeve gastrectomy was identified by Current Procedure Terminology (CPT) code 43775 and laparoscopic Roux-en-Y gastric bypass codes 43644 and 43645.

**Results:** 474,194 patients (136,133 LRYGB, 338,061 LSG) were identified. Significantly elevated rates of preoperative comorbidity were appreciated among LRYGB for reflux disease, hypertension, diabetes, limited patient mobility, myocardial infarction, deep vein thromboses, and venous stasis ( $p<.05$ ). Greater incidence of intraoperative stapling and length of procedure were also noted for LRYGB. Fewer postoperative complications were observed among the LSG cohort as well as lower unplanned ICU admissions, thirty-day readmission, reoperation, and death rates (LRYGB ICU 1.22%, readmission 2.42%, reoperation 6.19%, death 0.16%; LSG ICU 0.52%, readmission 0.88%, reoperation 3.11%, death 0.07%).

**Conclusions:** Our findings represent the first published study investigating the 2016 ACS-MBSAQIP database for laparoscopic Roux-en-Y gastric bypass and laparoscopic sleeve gastrectomy outcomes. It would appear LRYGB is favored for patients with increased preoperative comorbidity and associated challenges in the perioperative and postoperative course compared to LSG. Surgeon preference and familiarity with these techniques in addition to unique patient circumstances should be used as determinants in selecting the method of weight-loss surgery.



### A130

#### **Comparison of Operation Time and Operating Room Inefficiencies in Laparoscopic Gastric Bypass using a Surgical App**

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**Background:** Improving operating room (OR) inefficiencies is highly desirable and beneficial. Our goal was to assess the benefit of a novel application in identifying OR inefficiencies during laparoscopic Roux-en-Y gastric bypass (LRYGB) formation

**Methods:** The ExplORer Surgical app is an OR workflow management tool that focuses on real-time surgical procedure data acquisition during an operation. We prospectively implemented this tool in a single-center from July 2018 to January 2019. Using this tool, a research observer recorded the duration of each procedure step along with incidents such as disruptions/delays and missing/unnecessary supplies. The duration and standard deviation of each procedure step and incidents were calculated and compared to identify the highest variability as a proxy for inefficiencies. The comparison of the variability was done using F-test.

**Results:** Forty LRYGB procedures were observed. The gastric pouch (GP) formation had the highest time variability (SD) among procedural steps (Table) and its SD was significantly higher than the other steps but the Roux limb formation. Moreover, there was a significant linear correlation between the number of incidents during each procedural step and the duration of each step. (Figure) The most common types of incidents were distracting conversations 25.4%, equipment malfunction 8.5%, and missing supplies 5.9%.

**Conclusion:** The use of the ExplORer Surgical app allowed us to accurately record the duration and variability and undesired incidents. of each LRYGB procedural step. The identification of inefficient procedural steps and those with the most undesired incidents may allow targeted interventions to optimize OR efficiency.

### A131

#### **Alternative antibiotic prophylaxis impacts weight loss after Roux-en-y gastric bypass**

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**Introduction:** 10-15% of surgical patients report beta-lactam allergies requiring alternative preoperative antibiotic prophylaxis. Antibiotic-induced alterations to the community structure and metabolic function of the intestinal microbiota is dependent on drug class and lasts up to a year following exposure. As alterations to the gut fauna can influence both weight gain and loss, we hypothesized that alternative prophylaxis would impact postoperative weight loss in patients undergoing Roux-en-y gastric bypass (RYGB).

**Methods:** Retrospective review of 196 consecutive patients undergoing RYGB at one institution between 2015 and 2019. Patients who received outpatient antibiotics in the 6 months preceding

surgery were excluded. Patients were grouped into standard (cefoxitin) and alternative (levofloxacin and metronidazole) prophylaxis. Analyses used were student's t-test and Fisher's exact test. Error bars represent SEM. \* indicates  $p < 0.05$ .

**Results:** 143 patients in the standard group and 32 in the alternative group were identified. The alternative group included more female patients. Age, initial BMI, ASA score, length of stay and cost were similar between groups (Table). DBMI and %total weight loss were similar at 1 and 3 months postoperative between groups. At 6 months, a difference approaching statistical significance was observed ( $p=0.09$ ). By 12 months, patients that received alternative prophylaxis demonstrated significantly greater weight loss (Figure).

**Conclusions:** Patients that received alternative prophylaxis demonstrated increased weight loss at 12 months compared to those receiving standard prophylaxis. Further work to detail changes in the jejunal and colonic microbial communities could elucidate the mechanism of this observation and inform clinical practice.

### A132

#### DIABETES REMISSION SCORES IN MEXICAN POPULATION

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**Introduction:** Bariatric surgery is indicated for major weight loss in obesity and for the control or the remission of associated comorbidities, particularly diabetes. Several prediction scores have been proposed for this end, such as DiaRem, Ad-DiaRem, ABCD and DiaBetter. Nevertheless, they have not been evaluated in Latin American population.

**Objectives:** To evaluate the remission prediction performance of the different scores for diabetes, after Roux-en-Y Gastric Bypass (RYGP), among Mexicans.

**Methods:** Retrospective study from 63 patients operated at a single institution with more than 1 year follow-up. All patients had diagnosis of diabetes and remission was defined according to the ADA criteria. A baseline analysis, laboratory tests, and remission rates were first analyzed. Also, remission scores and cut-off values were assigned to each case with the original descriptions. A ROC analysis was performed for sensibility and specificity.

**Results:** Mean age was 44 years, 88.9% were female with initial mean BMI of 43.5 kg/m<sup>2</sup>, and mean HbA1C of 6.9% (Table 1). At 12 months, complete remission was obtained in 79.4%. ROC curves were plotted showing that DiaRem score had 81% sensitivity and 80% specificity (AUC 0.773  $p=0.004$ ), Ad-DiaRem 83% and 70% (AUC 0.792  $p=0.001$ ), ABCD 69.8% and 40% (AUC 0.551  $p=0.6$ ), and DiaBetter 77.3% and 70% (AUC 0.758  $p=0.001$ ) respectively (Figure 1).

**Conclusion:** In our study based in Mexican population who underwent RYGB, DiaRem, Ad-

DiaRem and DiaBetter scores are better predictors of diabetes remission at 1-year follow-up.

### A133

#### **Complications in Diabetic Patients Undergoing Weight Loss Surgery: An Analysis of the Metabolic and Bariatric Surgery Accreditation Quality Improvement Project (MBSAQIP): 2015-2017**

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**Introduction:** A large number of patients undergoing weight loss surgery suffer from diabetes, which is a significant comorbidity of obesity. Due to complications of diabetes, these patients may be at higher risk when undergoing weight loss surgery. Our aim was to compare rates of complications in diabetic and non-diabetic patients, as well as insulin dependent (IDDM) vs non-insulin (NIDDM) dependent diabetic patients undergoing sleeve gastrectomy and gastric bypass.

**Methods:** MBSAQIP patient use files, 2015-2017 were queried for patients with diabetes and insulin use status undergoing bariatric surgery. Patient characteristics were analyzed using Chi-square test and logistic regression analysis. Significance was considered at  $p < 0.05$ .

**Results:** 555,239 patients had weight loss surgery. 16.5% of patients had diabetes and 8% of patients had IDDM (32.7% of diabetics). Differences between diabetic and non-diabetic patients are shown in Table 1. Overall complication rates in diabetics were low but diabetes was associated with increased rates of complications. Noted differences, were higher death rates, admission to ICU and readmission rates in diabetic patients for both procedures. Comparing IDDM vs NIDDM, significant differences were found in superficial and deep wound infections, wound disruption, renal failure, UTI, ICU admission, readmission and death.

**Conclusions:** Weight loss surgery is safe in patients with diabetes, but with higher complication rates, specifically, in mortality rate, readmission to hospital, and admission to ICU postoperatively. Patients with IDDM have even higher rates of these complications compared to NIDDM patients. Weight loss surgery should be offered to diabetic patients with awareness that complications may be higher.

### A134

#### **SHORT TERM RESULTS OF A RANDOMIZED CONTROLLED TRIAL ON THE EFFECT OF LAPAROSCOPIC ONE ANASTOMOSIS GASTRIC BYPASS VERSUS LAPAROSCOPIC SLEEVE GASTRECTOMY IN TREATMENT OF OBESE TYPE 2 DIABETIC PATIENTS**

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**Introduction:** Recent guidelines on diabetes treatment provide that weight loss should be the most logical and cost-effective means of controlling T2D. Bariatric surgery is now considered the most effective and durable weight loss intervention. **Objectives:** To compare laparoscopic

one anastomosis gastric bypass (OAGB) and laparoscopic sleeve gastrectomy (SG) regarding the efficacy of control of T2D in obese patients.

**Methods:** a randomized controlled study was conducted on 162 obese ( $BMI \geq 30 \text{ kg/m}^2$ ) patients with type 2 D.M randomly divided into two groups, group (1): treated by SG, group :2 treated by MGB.

**Results:** 1-year follow-up of all included patients had shown that OAGB had a better effect than SG in diabetes remission detected by a larger drop of mean fasting blood sugar after one year of OAGB ( $37.80 \pm 6.41 \text{ mg/dl}$ ) in comparison to SG ( $29.93 \pm 12.84 \text{ mg/dl}$ ) and this difference was highly statistically significant ( $p \text{ value} < 0.004$ ). The mean HbA1c drop after one year in MGB ( $2.33 \pm 0.48 \%$ ) was larger than in SG ( $2.01 \pm 0.59 \%$ ) which was statistically significant ( $p \text{ value} < 0.024$ ). Effect of OAGB on diabetes resolution was faster than SG reflected by the percent of cases with early diabetes resolution at 6 months (46.7% with OAGB in comparison to 20% with SG).

**Conclusion:** OAGB has better and earlier effect than SG in diabetes remission. Oral hypoglycemic medications, C peptide  $> 3 \text{ ng/ml}$  and diabetes duration  $< 5$  years are considered independent predictors for diabetes resolution after the operation.

### A135

#### **Postoperative remission of type 2 diabetes according to data driven cluster patient classification prior to bariatric surgery.**

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**Background:** Baseline patient characteristics associated with remission of type 2 diabetes (T2D) after bariatric surgery (BS) are debated. A refined data driven cluster classification of diabetes has been recently proposed to identify individuals with increased risk of complication and help individualize treatment regimens (Ahlqvist Lancet Diabetes Endocrinol 2018). The impact of this new classification on the outcome of BS is unknown. Objectives: To analyze the relation between data driven cluster classification of T2D patients prior to BS and diabetes related outcomes one year after BS.

**Methods:** All T2D participants of the ABOS cohort who received BS from 2006 to 2018 were enrolled. Each patient was classified according among the 5 clusters of the new classification: SAID=severe autoimmune diabetes; SIDD=severe insulin-deficient diabetes; SIRD=severe insulin-resistant diabetes; MOD=mild obesity-related diabetes; MARD=mild age-related diabetes. Clusters were then related to prospective data on T2D outcomes at one year.

**Results:** All participants ( $n=446$ ) were classified among 3 clusters : SIDD, SIRD, and MOD, which had significantly different patient characteristics and rate of T2D remission. SIDD ( $n=20$ ; 4.5%) had the highest HbA1C level ( $p < 0.0001$ ), the lowest BMI ( $P < 0.001$ ), triglycerides level ( $p=0.01$ ) and HOMA2-B ( $p < 0.0001$ ) and the lowest rate of T2D remission one year after BS (11%). SIRD ( $n=43$ ; 9.6%) had the lowest HbA1C ( $p < 0.0001$ ), the highest HOMA2-B

( $p < 0.0001$ ), and HOMA2-IR ( $p < 0.0001$ ) and the lowest creatinine clearance (MDRD) ( $p = 0.01$ ) but the highest rate of T2D remission (69%). The decrease of HbA1c was highest in SIDD ( $p < 0.0001$ ), meanwhile weight loss was not significantly different between groups ( $p = 0.33$ ).

### A136

#### **Roux-en-Y gastric bypass (RYGB) surgery, but not caloric restriction, increases reward-related genes within the Ventral Tegmental Area in mice fed a high-fat diet**

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**Background:** Obesity is a risk factor for diseases such as diabetes, cancers, and heart diseases. Roux-en-Y gastric bypass (RYGB) surgery is one of the most effective treatments for obesity. After RYGB, patients lose weight and fat mass but how this occurs is poorly understood. Studies show that these individuals experience a decrease in hunger and desire to eat, especially high-calorie and fatty food, indicating changes in dopamine “reward” processing. These changes may explain their reduced food consumption and successful maintenance of weight loss.

To test if RYGB surgery alters the mesolimbic dopamine pathway in the brain, we assessed genes related to reward in the ventral tegmental area (VTA)—where dopamine neurons are located—from diet-induced obese mice twelve weeks after either Sham or RYGB surgery. Sham mice displayed lower expression of genes involved in activating dopamine signaling compared to lean, chow-fed controls. These findings are consistent with the reward-deficiency hypothesis, suggesting that individuals with obesity have diminished dopamine signaling or “satisfaction” making them overeat to increase dopamine transmission. Remarkably, mice after RYGB increased the expression of these genes compared to sham mice, indicating enhanced dopamine signaling. The lack of these changes in mice that lost the same amount of weight by caloric restriction suggests that these alterations are unique to RYGB surgery.

**Conclusions:** Collectively, our findings suggest that RYGB surgery, but not calorie restricted-weight loss, alters reward-related genes in the VTA that increase dopamine signaling. This may be a mechanism by which RYGB leads to reduced fat intake and successful weight loss.

### A137

#### **Revisional bariatric surgery to treat recurrent diabetes and pre-diabetes – positive metabolic effect in 60 patients**

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**Background:** A subset of bariatric patients present for revisional surgery with recurrence of diabetes or with new onset diabetes. The effectiveness of revisional metabolic surgery in this setting is not well defined. Objectives: Study the therapeutic effect of revisional surgery on diabetes/pre-diabetes

**Methods:** Diabetic/pre-diabetic patients were selected from a database of 138 revisional procedures performed by a single surgeon between 2015-2019. Patients with no recent follow up

were contacted by phone. The ASMBS outcome-reporting standard was used to define remission/recurrence.

**Results:** Sixty patients had abnormal glucose metabolism—23 with diabetes and 37 pre-diabetes (17% and 27% of all revisions). Mean pre-operative BMI was 43, age—49 years, 82% were female. Average time from original surgery to revision was 9 years. Types of revisional surgery performed are shown in Figure 1. After revision, 67% experienced complete remission and 33% - improvement of diabetes (78% follow-up rate). Pre-operative factors or post-operative weight loss did not predict remission. Two patients developed re-recurrence of diabetes after revision, both had poorly controlled diabetes pre-revision (HbA1c 11.7 and 9.1). Mean HbA1c decreased from 6.6 to 5.4 in diabetics and from 5.9 to 5.3 in pre-diabetics; and normalized in 67% of patients. The effect did not correlate with weight loss or type of revision, and persisted after excluding lap band revisions. Other outcomes were similar between diabetic, pre-diabetic and non-diabetic patients: hospital LOS—3 days, readmission—5%, major complications—1.6%, EWL and TWL at 1 year—60% and 24%.

**Conclusion:** Revisional surgery is effective in treating recurrent diabetes. Poorly controlled diabetes may be a risk factor for diabetes recurrence after revision.

### A138

#### **Outcomes of Bariatric Surgery in Adolescents: First Look Based on MBSAQIP**

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**Background:** Bariatric surgery is safe and effective, however, in adolescents it remains controversial. The purpose of this study is to evaluate the outcomes of bariatric surgery in adolescents based on the MBSAQIP database

**Methods:** We analyzed the 2015-2017 MBSAQIP database, patients  $\leq$  19 years of age were included in our analysis. Primary outcomes were 30 day-Serious Adverse Events (SAE), organ Space Infection (OSI), re-intervention and re-operation rates. Secondary outcomes included operation length, hospital stay and re-admission rates. We conducted separate Mann Whitney rank sums tests, chi square, or Fisher's exact tests as appropriate, with  $p < .05$  denoting statistical significance.

**Results:** A total of 1983 adolescent patients were included in our analysis. The average age and BMI were 18.1 and 47.5 respectively. 21.7% underwent LRYGB (Laparoscopic Roux en Y Gastric Bypass) and 78.3% underwent LSG (Laparoscopic Sleeve Gastrectomy). The 30-days SAE and readmission rates were significantly lower for LSG compared to LRYGB (2.9% and 2.6% vs 6.5% and 5.6% respectively;  $p < 0.05$ ). The 30 day reoperation rate was also lower for LSG compared to LRYGB albeit not significant (1.1% and vs 2.3%,  $p = 0.05$ ). The 30 day intervention within 30 days for LSG was significantly lower, however, compared to LRYGB (1.2% vs 3%,  $p < 0.05$ ). Compared to adult patients,  $>19$  yo ( $n = 353,726$ ) we found no difference in our outcomes. However, adolescents had significantly shorter operation length.

**Conclusions:** In adolescents LSG had fewer SAE, reintervention and readmission rates compared to RYGB. There was no difference in outcomes between adolescents and adults.

### A139

#### **Gastric bypass and sleeve gastrectomy for hepatic steatosis in type 2 diabetes – a randomized controlled trial**

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**Background:** Bariatric surgery may improve hepatic steatosis in patients with type-2 diabetes. We aimed to compare the effect of Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) on liver fat fraction (LFF), fatty liver index (FLI) and liver enzymes 5 weeks and 1 year after surgery.

**Methods:** Patients with type-2 diabetes and severe obesity were included in the triple blinded randomized Obesity surgery in Tønsberg (*Oseberg*) trial, and randomly allocated to RYGB or SG. LFF was estimated with the modified Dixon method calculating the percentage of liver-fat using magnetic resonance imaging (MRI). Low grade (G1) hepatic steatosis was defined in patients with values below the 25<sup>th</sup> percentile of LFF at baseline. Surrogate markers for hepatic steatosis included FLI and liver enzymes alanine aminotransferase (ALAT), gamma-glutamyl transferase (GGT) and alkaline phosphatase (ALP).

**Results:** A total of 82 patients (60% female) with mean (SD) age 47.9 (9.6) years, BMI 41.6 (4.8) kg/m<sup>2</sup>, duration of diabetes 6.2 (5.3) years, HbA1c 67 (20) mmol/mol, LFF of 19.8 (11.9) %, were included in the analyses. At 5-week and 1-year, 74% vs 79% and 100% vs 93% (ns), achieved low-grade (G1) hepatic steatosis in the RYGB and SG group, respectively (Figure). FLI, ALAT and GGT decreased in both groups, and ALAT were significantly higher (p=0.040) in the RYGB group at 1 year (Table).

**Conclusions:** Patients who underwent RYGB and SG had a similar short- and medium-term decrease in liver fat fraction, but the RYGB group had a higher serum level of ALAT at 1 year.

### A140

#### **Perioperative Outcomes and Fellow Experience during Minimally Invasive Bariatric Surgery Training**

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**Background:** Operative performance of minimally invasive bariatric surgery (MIBS) fellows often improves dramatically over the course of training. In our study we sought to determine whether patient outcomes would be affected by the level of experience of the fellow during training.

**Methods:** 880 consecutive primary MIBS cases were analyzed: Roux-en-Y gastric bypass (RYGB), vertical sleeve gastrectomy (VSG), performed at a single academic institution over 6 years. Cases were performed by the fellow as the primary surgeon with attending assistance. Data was compared between cases performed during the first half of the fellowship year and during the second half.

**Results:** 434 MIBS cases were performed in the first six months (RYGB-A=365, VSG-A=69) and 446 MIBS cases (RYGB-B=338, VSG-B=108) in the second six months of training. Operative time did not change significantly for VSG (116.7±39.4 minutes vs 110.9±41.3 minutes,  $p=0.35$ ) but was significantly improved for RYGB (184.2±45.5 hours vs 159.3±52.4 hours,  $p<0.0001$ ). Overall, major morbidity and mortality (M&M) were low [venous thromboembolism=0.51%, splenic injury=0.30%, transfusion=2.13%, gastrointestinal hemorrhage=0.10%, wound infection=0.30%, marginal ulcer=1.34%, internal hernia=0.16%, reoperation=0.51%, mortality=0.10%]. M&M rates did not significantly differ from the first to second half of the year (4.13% vs 4.12%,  $p=0.996$ ).

**Conclusions:** Surgical outcomes are not adversely affected by relative inexperience of MIBS fellows early in the fellowship year in patients of similar surgical complexity, acuity, and disease severity.

#### A141

##### **Laparoscopic vertical gastric clip B-Clamp® for weight loss: a first European experience**

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**Introduction:** Sleeve gastrectomy (SG) has gained popularity in France and worldwide as surgical treatment of obesity, despite potential severe complications. Laparoscopic vertical gastric clip (LVGC) could be a reversible alternative to SG, not requiring digestive resection, and producing significant weight loss. It could allow to decrease complications, such as gastric fistula or gastro-esophageal reflux disease. Objectives: We report the short-term results of our initial experience in LVGC.

**Methods:** Seven patients, 6 women and 1 man, with median age of 50 years [23; 59] and median BMI of 38.8 kg/m<sup>2</sup> [33.7; 46.6], underwent LVGC between January and March 2019. LVGC consists in a silicone-covered titanium backbone (B-Clamp®, MID, Dardilly, France) separating medial lumen from partially excluded lateral gastric pouch, with an inferior opening allowing gastric juice emptying (figure 1).

**Results:** All procedures were successfully realized under laparoscopy; median total operative



time was 97 min [67; 117]. There was nor peroperative neither postoperative complication within 30 days. Median hospital length of stay was 1 day [1; 2]. Median excess weight loss was 15.1% [13.8; 22.2] at 1 month, and 35.8% [24.7; 43.5] at 3 months. Fasting glucose in diabetic patients improved at 1 month (2.07 g/L [1.94; 2.19] vs 1.22 g/L [0.99; 1.42]). Digestive absorption was not modified (D-xylose test).

**Conclusion:** LGVC seems to be a safe and efficient alternative to SG for treatment of severe obesity. Short-term results are encouraging, but still need to be confirmed both in term of long-term weight loss and in reduction of complications.

#### A142

##### **Evolution of Robotic Outcomes in Bariatric Surgery: First look at MBSAQIP database**

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**Background:** Robotic surgery has many advantages and is gaining momentum in various specialties. However, the use of the robotic platform in bariatric surgery remains controversial. Objective: The aim of this study is to analyze the evolution of safety and outcomes of robotic surgery over time based on the MBSAQIP database between 2015 and 2017.

**Methods:** Using the MBSAQIP databases 2015 to 2017 we created balanced groups using propensity score matching based on preoperative clinical variables. Our primary outcomes included 30-day Serious Adverse Events, Readmissions and interventions. Of the 315,647 patients included 41,364 matched and were included in our analysis. We used the Cochran-Mantel-Haenzel method to test for the association between outcomes and surgical groups over time from 2015 to 2017 with year as stratification variable. We also utilized student t-test for direct comparison of outcomes for the various groups with  $p < 0.05$  denoting statistical significance

**Results:** We found a significant association between outcomes and year of performance for the incidence of 30-day readmission and 30-day intervention (OR=1.37 and 1.16 respectively,  $p < 0.05$ ). However, there was no correlation between 30-day readmission and year of performance (OR=1.05,  $p > 0.05$ ). The incidence of 30-day SAE, readmissions and interventions for the robotic group in 2017 were statistically lower compared to 2015 (3.7%, 4.0% and 1.3% respectively in 2017 versus 5.2%, 5.2% and 2.2% in 2015  $p < 0.05$ )

**Conclusion:** The incidence of adverse events following robotic bariatric surgery has significantly decreased over the past few years between 2015 and 2017 based on MBSAQIP.

#### A143

##### **THE IMPACT OF GLYCEMIC CONTROL ON BARIATRIC SURGICAL OUTCOMES IN DIABETIC PATIENTS: AN MBSAQIP ANALYSIS**

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**Introduction:** More than 90% of type II diabetics have obesity, and over 85% of diabetic patients who undergo bariatric surgery will see improvement or resolution of diabetes. However, diabetes (DM) is a known risk factor for surgical complications. It is unclear whether tight preoperative glycemic control confers a perioperative benefit upon this complex patient population.

**Methods:** From the 2017 MBSAQIP database, we identified patients with DM who underwent weight metabolic and bariatric surgery (MBS). An unmatched and propensity-matched analysis, as well as multivariate logistic regression were performed to assess thirty-day perioperative outcomes between patients with poor ( $HA1c > 7$ ) compared to good glycemic control ( $HA1c \leq 7$ ).

**Results:** Of 20,287 diabetic patients, 10,342 (50.97%) met a target  $HA1C$  of  $\leq 7$ . Patients with poor glycemic control had higher rates of postoperative infection (2.42% vs. 1.8%,  $RR=1.35$ ,  $p=0.002$ ), readmission (4.99% vs. 4.05%,  $RR=1.23$ ,  $p=0.001$ ), unplanned ICU transfer (1.32% vs. 0.92%,  $RR=1.43$ ,  $p=0.007$ ) and overall morbidity (6.65% vs. 5.53%,  $RR=1.20$ ,  $p=0.001$ .) In matched analysis of 17,596 patients controlling for BMI, operation type, approach, and all other major comorbidities, the findings of poorer infectious and general outcomes were preserved in patients with poor glycemic control. On multivariate analysis, poor glycemic control was an independent risk factor for morbidity ( $b=1.166$ ,  $p=0.010$ ).

**Conclusions:** In diabetic patients, poor glycemic control increases the risk of 30-day adverse outcomes following MBS, and this risk is independent of other comorbidities or patient characteristics. Glycemic control should be of paramount importance prior to bariatric surgery to minimize the risk of complications.

#### A144

##### **Metabolic and Bariatric Surgery in Prior Solid Organ Transplantation Patients: Is Diabetes an Independent Predictor of Adverse Outcomes?**

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**Introduction:** Diabetes mellitus (DM) is frequently present in Metabolic and Bariatric Surgery (MBS) patients and is independently associated with increased morbidity. Organ transplantation patients also suffer from severe obesity and are now increasingly undergoing MBS. Our aim was to determine if DM independently impact perioperative outcomes following MBS in previous solid organ transplantation patients.

**Methods:** A retrospective analysis was performed of Sleeve Gastrectomy (SG) and Roux-en-Y gastric bypass (RnYGB) patients in the 2017 Metabolic and Bariatric Surgery Accreditation Quality and Improvement Project (MBSAQIP) database. Patients with a history of solid organ transplantation were identified and stratified by Diabetes Mellitus status. Outcomes were compared by Mann-U-Whitney, Chi-square Test and Multivariable Logistic Regression (MLR) analysis.

**Results:** Of 614 MBS cases with prior organ transplantation in the MBSAQIP database, 338 were analysis, including 132 (39%) with and 206 (61%) without DM. Patients with DM were more likely to be male ( $p < 0.001$ ), with a history of cardiac surgery (0.002), hypertension ( $p < 0.001$ ), hyperlipidemia ( $p < 0.001$ ), obstructive sleep apnea ( $p < 0.001$ ), and have less independent functional status ( $p = 0.01$ ). There was no significant difference in morbidity, mortality and aggregate complications between DM and no DM study cohorts. In MLR analysis, DM was not predictive of adverse outcomes (Table 1).

**Conclusion:** MBS in Diabetic patients with previous solid organ transplantation is overall safe, with low rates of morbidity and mortality. Diabetes was not an independent predictor of adverse outcomes in this cohort of patients. Larger cohort studies are needed.

#### A145

### RESIDENT FIRST ASSISTANCE IN METABOLIC AND BARIATRIC SURGERY: DO PATIENTS PAY A PRICE?

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**Introduction:** First assistant during metabolic and bariatric surgery often consists of either a resident, nurse practitioner (NP), or physician's assistant (PA). While PA/NPs are typically consistent members of the bariatric team, residents are rotating members for whom operating serves additionally as a training experience. It is unclear whether and to what extent the inclusion of residents has upon surgical outcomes.

**Methods:** From the 2015-2017 MBSAQIP database, we identified patients who underwent weight loss surgery with either an NP/PA or Resident as a first assistant. Patient demographic characteristics, comorbidities, intraoperative practice patterns, complications, and thirty-day outcomes were compared between patients with Resident versus PA/NP first assistance.

**Results:** Of 264,627 patients, 84,804 (32.05%) of procedures were performed with Resident first assistance. Operative length with Resident assistance was on average over 20 minutes longer (104.5 vs. 82.7 min, ROM=1.26,  $p < 0.001$ ). These had higher rates of unplanned ICU admission (0.83% vs. 0.67%, RR=1.24,  $p < 0.001$ ) and hospital readmission (4.48% vs. 3.85%, RR=1.16,  $p < 0.001$ ), more postoperative bleeding (0.53% vs. 0.42%, RR=1.24,  $p < 0.001$ ) and infection (1.52% vs. 1.38%, RR=1.11,  $p = 0.003$ ), and increased overall morbidity (6.06% vs. 5.19%, RR=1.17,  $p < 0.001$ ) corresponding to a number needed to harm of 114. On matched analysis, the relationship between resident assistance and poorer 30-day outcomes was preserved.

**Conclusions:** While training future surgeons is an important aspect of bariatric surgery, inexperienced trainees or shifting roles within a surgical team may confer increased surgical risks to patients. Strategies are needed to optimize patient safety while maintaining a robust resident experience.

**A146**

**Laparoscopic Sleeve Gastrectomy versus Laparoscopic Roux-en-Y Gastric Bypass: A Meta-Analysis of Weight Loss, Comorbidities, and Biochemical Outcomes from Randomized Controlled Trials**

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**Background:** Laparoscopic sleeve gastrectomy (LSG) and Roux-en-Y gastric bypass (RYGB) are the two most commonly performed bariatric surgeries worldwide. The comparative outcomes of these procedures are a topic of ongoing debate and its long-term outcomes remain uncertain. Objectives: To compare weight loss, comorbidities, biochemical, and quality of life outcomes of LSG versus RYGB through a meta-analysis of randomized controlled trials (RCTs).

**Methods:** MEDLINE, EMBASE, CENTRAL, and PubMed were searched from database inception to January 2019. Randomized controlled trials (RCTs) comparing LSG versus RYGB were included. Outcomes included weight loss, comorbidities, biochemical profile, and quality of life (QoL) scores. Pooled estimates were calculated using random-effects meta-analysis at 1, 3, and 5-year follow-ups. The GRADE approach was used to assess the overall certainty of evidence.

**Results:** 33 studies involving 3,187 patients were included. RYGB resulted in a significantly greater loss of BMI compared to LSG at 1 year (MD -1.25kg/m<sup>2</sup>, 95%CI -2.01 to 0.49, *P*=0.001) which persisted at 3, but not at 5 years. Remission of dyslipidemia was significantly higher in RYGB group than LSG at 1 year (RR 0.58, 95%CI 0.46-0.73, *P*<0.001) and 5 years (RR 0.68, 95%CI 0.46-0.99, *P*=0.04). There was no difference between two surgeries for the rate of complications, QoL scores, remission of type 2 diabetes, hypertension, and obstructive sleep apnea at all follow-up time points. All outcomes were low to moderate certainty of evidence.

**Conclusion:** LSG and RYGB are both excellent and comparable bariatric procedures at five years with RYGB having a better overall metabolic impact.

**A147**

**Exploring racial disparities in metabolic and bariatric perioperative outcomes amongst the elderly: Is race independently predictive of perioperative outcomes?**

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**Background:** Metabolic and bariatric surgery (MBS) is increasingly performed in elderly patients (age ≥ 65 years) with equivocal reported outcomes. Controversy about racial disparity in outcomes following MBS also remain. MBS outcomes in elderly, racial cohorts remain unexplored. We seek to determine if Black Race independently predicts adverse outcomes in elderly, MBS patients.

**Methods:** Primary sleeve (SG) and gastric bypass (RnYGB) cases were identified from the

2015-2017 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database. Those age  $\geq 65$  years were included and stratified by race (Black vs. White). Univariate and multivariate logistic regression analysis were performed, comparing descriptive statistics and outcomes in Black and White elderly MBS cohorts.

**Results:** 23,979 MBS cases were performed in elderly Black (8.9%) and White (91.1%) patients. Black patients were more likely to be female, younger, with a higher BMI and receive SG and robotic-assisted surgery. Black patients had a higher prevalence of hypertension, diabetes, renal disease, steroid use, smoking, IVC filter use and prior organ transplantation (Table 1). Outcomes were similar between racial cohorts, except for higher rates of aggregate renal complications ( $p=0.019$ ), overall ( $p=0.005$ ), related morbidity ( $p=0.035$ ) in Black patients. On multivariate analysis, Black Race was an independent predictor of adverse outcomes ( $p = 0.038$ ); however, RnYGB most predictive of adverse outcomes (Wald 180.8,  $p < 0.0001$ ).

**Conclusion:** Being black is an independent predictor of adverse outcomes following MBS in elderly patients. Despite this, the absolute risk of adverse outcomes in elderly racial MBS cohorts remains very low.

#### A148

#### **Safety of Robotic Surgery in the Super Obese Patients: First Analysis Using MBSAQIP data 2015-2017.**

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**Background:** Bariatric surgery in the superobese (SO) patients ( $BMI \geq 50$ ) represents a challenge compared to the morbidly obese (MO) patients ( $BMI < 50$ ). Robotic surgery is increasingly used in bariatric surgery but remain a controversial topic. Objective: The aim of this study is to compare the safety and short-term outcomes of robotic surgery in the SO versus MO categories.

**Methods:** We evaluated all primary robotic and laparoscopic cases in the MBSAQIP database 2015-17. We extracted the 30-day outcomes of all patients divided into two different groups based on BMI ( $\geq 50$  versus  $< 50$ ). We used the Cochran-Mantel-Haenszel method to indicate whether there is a significant association between BMI and outcomes while accounting for surgery type (Sleeve versus Gastric Bypass). We then performed a subgroup analysis using a paired t-test comparing robotic to laparoscopic surgery for both BMI categories.

**Results:** A total of 332,649 patients were included in our analysis. For both the robotic and laparoscopic groups, SO patients had a significantly higher incidence of 30-day Severe Adverse Events (SAE) and readmission compared to MO (OR=1.27 and 1.17 respectively for SAE ; OR=1.11 and 1.17 for readmission). There was no statistical difference in the incidence of 30-day SAE between robotic and laparoscopic approaches for SO (6.5% versus 6.7% respectively for Gastric Bypass and 7.6% versus 7.2% for Sleeve Gastrectomy,  $p > 0.05$ )

**Conclusion:** Based on the MBSAQIP database, SO had a higher 30-day SAE and readmission

compared to MO patients. We found no difference in outcomes between robotic and standard laparoscopic approaches for SO patients.

## A149

### Procedureless Gastric Balloon for Weight Loss: Multi-Center Experience in 1623

#### Consecutive Patients

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**Background:** The Elipse™ Balloon has emerged as a novel, non-endoscopic option for patients with obesity or overweight. It is swallowed in an outpatient setting and filled with 550ml of fluid. After 4 months of gastric residence, the balloon spontaneously empties and is excreted naturally. Objective: To evaluate the safety and efficacy of the current generation Elipse Balloon in a large, multicenter, international population.

**Methods:** Outcomes data from 1623 consecutive Elipse Balloon patients (1171F/506M) treated in 19 centers across 7 countries were pooled for analysis. Nutritional counseling was provided. Data included weight loss, metabolic parameters, ease of placement, device performance, and complications.

**Results:** At placement, mean age was 39.2±12 yrs, mean weight 94±18.6 kg and mean BMI 34.2±5.4 kg/m<sup>2</sup>. Triglycerides, LDL cholesterol and HgB A1C were 144.6±70.8 mg/dl, 133.2±43.8 mg/dl and 5.1±1.2% respectively. After 4 months, TBWL was 13.6±5.7%. Mean WL, mean EWL and mean BMI reduction were 12.9±6.5 kg, 55.8±1.1% and 4.9±3.3 kg/m<sup>2</sup> respectively. All metabolic parameters improved. 99.9% patients were able to swallow the device with 31.7% needing stylet assistance. Ten (0.62%) empty balloons were vomited and the rest were excreted in stool. Three (0.18%) balloons deflated early. 41 (2.5%) patients had intolerance requiring endoscopic balloon removal. One (0.06%) patient developed esophagitis. One (0.06%) had gastric perforation requiring surgery. There were no small bowel obstructions or any other serious complications.

**Conclusion:** The Elipse™ Balloon demonstrated an excellent safety profile with no small bowel obstructions. The balloon also exhibited remarkable efficacy with 13.6% TBWL and improvement across all metabolic parameters.

## A150

### **An Intensive 52-week Nutritional, Exercise and Behavior Modification Program: Comparison With or Without the Elipse Intra-gastric Balloon**

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**Background:** Weight loss (WL) comparison of intra-gastric balloons (IGB) with lifestyle intervention (LI) has been assessed in three FDA-regulated clinical trials in which LI included basic nutritional education, not reflecting the full potential of either IGB or LI. This is the first prospectively collected, BMI-matched, intention to treat study comparing an intensive 52-week LI with (EGLI, N=79), or without (ILI, N=413) the Elipse IGB (Allurion Technologies, Inc.).

ILI included a structured curriculum-based nutritional, exercise and behavior modification program. The Elipse is a swallowable, fluid-filled IGB that does not require endoscopy or anesthesia for either placement or removal. It remains in the stomach for 16 weeks and then deflates and passes naturally.

EGLI and LI had similar mean initial BMI ( $36.2 \pm 5.4$  vs  $36.8 \pm 5.0$ ) but mean age ( $43.0 \pm 10.8$  vs.  $48.3 \pm 12.4$ ,  $p=.0033$ ) and %females (68.4% vs. 85.9%,  $p=.0063$ ) were different. %TBWL was greater at EGLI at 16- (N=51,  $13.6 \pm 5.0$  vs. N=179,  $6.4 \pm 4.7$ ,  $p<.0001$ ), 24- (N=22,  $13.3 \pm 4.7$  vs. N=122,  $6.4 \pm 6.4$ ,  $p<.0001$ ) and 52-week (N=11,  $14.0 \pm 6.2$  vs. N=41,  $7.9 \pm 7.5$ ,  $p=.0184$ ) follow-up. %patients achieving 5% at 16, 24 and 52 weeks and 10%TBWL at 16- and 24 weeks was greater ( $p<.0001$ ) at EGLI. Elipse was independently associated with greater %TBWL ( $p<.0001$ ) in regression analysis controlling for age and gender. Attrition rates were significantly lower at EGLI at 16, 24 and 52 weeks ( $p<.0001$ ).

**Conclusions:** Elipse is an independent and highly significant contributor of WL when added to a 52-week ILI. Elipse greatly improves the % of patients achieving a meaningful weight loss and patients' adherence to ILI.

## A151

### **Long Term Results of The Roux-En-Y Fistulo-Jejunostomy in Patients With Post-Sleeve Gastrectomy Leak**

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**Background:** Leak occurs in less than 3% of patients after sleeve gastrectomy (SG). However, the management of post SG leaks (SGL) is difficult, long, and challenging. We analyzed the long-term results of the Roux en Y fistulo-jejunostomy (RYFJ) as the ultimate treatment of SGL resistant to conservative treatment.

Between January 2007 and December 2017, we managed 150 patients with SGL. Prior to surgery, intraabdominal or thoracic abscesses or collections were either ruled out or treated by

endoscopy, computerized tomography (CT) scan guided drainage, or even surgery. In case of failure of these measures, selected patients had RYFJ.

Long-term results were assessed using clinical evaluation, biological analysis, upper digestive tract endoscopy, CT scan with upper series, and miscellaneous additional tests.

Between January 2007 and December 2017, 72 patients (52 women and 20 men) had RYFJ for SGL. Mean age was 37 years (range, 17-59). Mean follow up period was 61 months (15-129). 5 patients were lost to follow-up.

Mean BMI was 27.4 kg/m<sup>2</sup> (22-41) at 3 years and 31.9 kg/m<sup>2</sup> (21-44) at 5 years, respectively.

Detailed biological, endoscopic, and radiological data were retrieved. Upper tract endoscopy showed the healing of SGL in 100 % of cases. GERD related endoscopic abnormalities were disclosed in 14 patients (20.1 %). 4 patients were reoperated and had Roux en Y Gastric Bypass (RYGB).

**Conclusions:** RYFJ is a safe and feasible salvage procedure for patients with SGL. Long-term outcome analysis confirms that fistula control is durable. Weight loss panel is satisfactory. No *de novo* metabolic disturbances were found.

## A152

### **Predictive factors of healing failures for “malignant” leakage after sleeve gastrectomy.**

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**Background:** Gastric leak occurs after sleeve gastrectomy (SG) in 2% of cases. Most staple-line disruptions (SLD) can be successfully treated with first line endoscopic procedure. Less favorable situations may lead to more complex therapeutic strategies, like conversion to Roux-en-Y Gastric Bypass (RYGBP). The literature indicates that SLD with a “malignant” evolution should be treated in specialized bariatric centers. Aim of the study: To predict factors of failure of endoscopic treatment and to assess safety of conservative endoscopic strategies and conversion to RYGBP.

**Methods:** We included all patients treated in two centers of academic excellence (n=100) between 2013 and 2017 who had a malignant SLD after SG. A “malignant” leakage met one of the following poor prognosis criteria: unsuccessfully treated by the first line endoscopic treatment; generalized peritonitis; anatomical anomalies; gastrocutaneous or gastropleural fistula (GC/GPF); chronic leaks (>4 weeks).

**Results:** No deaths occurred during the follow-up (20±12 months). The endoscopy reported an anatomically abnormal gastric tube in 37 (37%) patients (stenosis (n=23 (23%)), twist (n=9 (9%)) or both (n=5 (5%)). Conversion to RYGBP because of leakage recurrence or persistence was necessary in 31 (32%) patients. Stenosis, twist, or GC/GPF significantly prevented healing in multivariate analysis (respectively: p<0.001, OR=7.8 and p<0.001,



OR=24 – logistic regression). GERD was more frequent in the absence of conversion into RYGBP (36.9 vs 8.6%,  $p<0.001$ ).

**Conclusions:** Endoscopy is the treatment of choice for the management of leaks after SG. The association of anatomical anomalies and GC/GPF lead to conversion to RYGBP.

### A153

#### **Concomitant hiatal hernia repair with sleeve gastrectomy: a 5 year analysis of the Texas Public Use Data File**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Background:** The sleeve gastrectomy (SG) can be associated with postoperative gastroesophageal reflux (GERD) and when a hiatal hernia is present, it should be fixed. Earlier studies have shown that 20% of SG have a concomitant hiatal hernia repair (HHR) in a large clinical database (MBSAQIP). Administrative databases can also be used to examine this practice.

**Methods:** The Texas Inpatient Public Use Data File (IPUDF) and Outpatient Public Use Data File (OPUDF) for the years 2013-2017 were examined for patients that underwent SG+HHR at the same time. Patient demographics, diagnosis and cost data were examined. We also examined mesh vs non-mesh HHR. A t-test was performed between groups and P was considered significant at  $< 5\%$ .

**Results:** In the OPUDF, there were 6,193 (33.7%) patients who underwent SG+HHR out of 18,403 patients who underwent SG. SG alone cost an average of \$31,000 less billed charges than SG+HHR. The length of stay (LOS) was 2.1 vs 2.3 days with a shorter stay for SG+HHR vs SG alone. In the IPUDF, there were 11,536 (21.1%) patients who underwent SG+HHR out of 54,545 patients who underwent SG. Mean cost for SG was \$5,392 billed charges less than for SG+HHR. LOS was 1.59 vs 1.63 days (SG+HHG vs SG). Out of the SG+HHR patients, only 4.3% had a mesh placed.

**Conclusions:** SG+HHR is common in both the outpatient and inpatient setting. A small percentage of these patients had mesh placed.

### A154

#### **SLEEVE GASTRECTOMY ANATOMY ASSOCIATION WITH EXCESS WEIGHT LOSS AND SYMPTOMS EVALUATED BY 3D VOLUMETRY ON COMPUTARIZED TOMOGRAPHY STUDY**

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**Background:** Sleeve gastrectomy is currently the most common bariatric procedure performed worldwide. However there is no a standardized method to compare sleeve size with weight loss or the relationship with its anatomy with possible complications symptoms. Objective: To describe the use of 3D CT scan Volumetry in the postoperative period as a tool for follow up.

**Methods:** We reviewed 113 consecutive patients chart of a prospective cohort that underwent Sleeve Gastrectomy and agreed to undergo a postoperative CT Volumetry. The 3D CT scan was performed on an empty stomach after the ingestion of sodium bicarbonate that allowed the stomach to distend. The volumen of the Sleeve was calculated and the its shape was also noted. Clinical information regarding weight and gastrointestinal symptoms specifically reflux was gathered.

**Results:** The mean volume of the sleeve increased with time at 3-12, 13-24, 25-36, 37-48, 49-60 and more than 60 months, it was 158.8cc, 155.3cc, 184.6cc, 184.9cc, 215.7cc and 256.7cc respectively. The BMI of the patients groups were 25.1, 26.0, 23.9, 27.7, 27.7, 28.8 kg/m<sup>2</sup> respectively. 86 patients (76.7%) of this cohort had symptomatic reflux and 71 (62.8%) of those had a sliding hernia noted on CT Volumetry compared with only 40 found on routine upper GI study.

**Conclusions:** 3D volumetry CT scans seems to be helpful to evaluate the sleeve gastrectomy shape and size and its possible association with reflux weight loss. This imaging study could be use potentially as adjunct along with other studies to have a well-rounded evaluation

## A155

### **Parathyroid hormone changes after sleeve gastrectomy: a systematic review and meta-analysis**

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**Background:** Roux-en-Y gastric bypass (RYGB) adversely affects bone health resulting in low calcium, low vitamin D and increased parathyroid hormone (PTH) due to its malabsorptive mechanism. The evidence is less well described for sleeve gastrectomy (SG). This meta-analysis aimed to identify all studies that collected data on changes in PTH, calcium and 25-hydroxyvitamin D [25(OH)D] after SG.

**Methods:** MEDLINE and EMBASE were searched through March 2019 for eligible studies which meet the following criteria: 1) Participants were obese adult aged  $\geq 18$  years who underwent SG; 2) serum 25(OH)D, calcium and PTH were reported at baseline and at follow up after SG; ; 3) Follow-up duration was at least 6 months. Pre-operative and post-operative mean of each outcome of interest and corresponding SD were extracted from each study and the mean difference (MD) was calculated. Pooled MD was then calculated by combining MDs of each study using random-effects model.

**Results:** A total of 19 studies with 1,972 SG patients were included. There was a significant increase in serum calcium (pooled MD of 0.07 mg/dL; 95%CI 0.01 to 0.13; I<sup>2</sup>= 74%),

serum 25(OH)D (pooled MD of 8.53 ng/mL; 95%CI 5.94 to 11.12; I<sup>2</sup>= 90%) after SG. On the other hand, serum PTH significantly decreased after the surgery (pooled MD of -12.62 pg/mL; 95%CI -17.91 to -7.33; I<sup>2</sup>= 90%).

**Conclusions:** As opposed to RYGB, this current study found a decrease in PTH and increase in calcium and 25(OH)D among obese patients who underwent SG.

#### A156

##### **Esophageal Cancer after Sleeve Gastrectomy: A Population-based Cohort Study**

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**Background:** Sleeve gastrectomy (SG) is the most commonly performed bariatric surgery worldwide. SG is associated with gastroesophageal reflux disease (GERD) which in turn is linked to esophageal cancer (EC). The true impact of SG on risk of EC remains unknown. We aimed to investigate and compare the incidence of dysplastic Barrett's esophagus (dBE) and EC following SG.

**Methods:** We studied a population-based cohort of all morbidly obese patients who underwent bariatric surgery in the province of Quebec, Canada from 2006-2013. We compared patients who had "reflux-prone" procedures (SG and biliopancreatic diversion with duodenal switch [BPD-DS]) to the "reflux-protective" control group of Roux-en-Y gastric bypass (RYGB) patients. Primary end-point was development of esophageal dysplasia/neoplasia (dBE and EC). Cox regression was used to obtain hazard ratio (HR).

**Results:** We identified 4,289 surgeries in the reflux-prone group (SG=2,426; BPD-DS=1,863) and 853 in the RYGB group. Incidence rate of EC in the study cohort was 0.049% per-year (N=19). Sixteen cases belonged to the reflux-prone and 3 to the control group (incidence rate of 0.049% and 0.046% per-year, respectively). At a mean (standard deviation) follow-up of 7.6±2.3 years and after adjusting for age, sex, Charlson comorbidity index and presence of preoperative GERD, HR for any dBE or EC was 0.93 (95% CI: 0.27-3.22).

**Conclusion:** This long-term population-level study did not reveal an increase in the incidence of dBE and EC after "refluxogenic" bariatric procedures compared to the "reflux-protective" RYGB. Given low incidence and slow progression of esophageal dysplasia/neoplasia, studies with longer follow-up may help better answer this question.

#### A157

##### **36 F Bougies Have More Complications and Reflux Than 40F in Laparoscopic Sleeve Gastrectomy Patients**

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**Background:** Postoperative reflux remains one of the major concerns with Laparoscopic Sleeve Gastrectomy (LSG) and may be related the size of the bougie used intraoperatively. Bougie size may also affect complication rates. Aim: The aim of this study is to compare the outcomes following LSG when using 36-French (F) versus 40-F bougie in terms of reflux symptoms and complication rates.

**Methods:** This is a retrospective, comparative study, consisting of patients who underwent LSG between January 2012 till January 2016 with at least 2-years follow-up.

The patients were classified into 2 groups: Group A (n=352) who underwent LSG using a 36 F bougie and group B (n= 334) who underwent LSG using a 40 F bougie. We documented the reflux symptoms pre and post-operatively along with peri-operative complications.

**Results:** 17.4% of patients in group B showed improvement in their reflux symptoms as compared to 3.1% of patients in group A.

1.8% of patients in group B had complications post LSG compared to 17.4% of patients in group A, including leak, bleeding, and Superior Mesenteric Vein Thrombosis.

3 (0.8%) of the patients in Group A eventually required conversion to another procedure due to reflux symptoms

**Conclusions:** The use 40 F bougie in LSG resulted in significant improvement in reflux symptoms and was associated with fewer complications compared to the use of a 36 F. Reflux symptoms were severe enough to warrant conversion in a significant number of patients in the 36F bougie group but not in the 40 F group.

## A158

### **Jejunum-Ileal Loop Bipartition (JILB) with Sleeve Gastrectomy is Superior to Sleeve Gastrectomy Alone in Diabetes Treatment**

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**Background:** We designed a jejunal-ileal loop bipartition (JILB) procedure as shown in Figure 1. We hypothesize that adding JILB onto SG is superior to SG alone in metabolic remission but without bypassing any intestine.

**Methods:** Zucker diabetic fatty rats (n=18) with typical obese and diabetic phenotype were divided into three groups according to the procedure underwent: SG with JILB (n=6, Figure 1), SG with jejunal-ileal bypass (JIB, n=6, Figure 2) or SG with the sham procedure (n=6). Body weight, food intake, fasting blood glucose (FBG) and OGTT were measured before and 2 and 4 weeks after surgery. Plasma GLP-1 were measured before and 4 weeks after surgery. In addition, the histomorphological examination was performed after euthanization.

**Results:** Body weights were similar in all groups at each time point after the operation. Comparing with SG+Sham animals, SG+JILB and SG+JIB lead to lower FBG. OGTT showed that the glucose tolerance of the SG+JILB group was significantly improved compared with the SG+S group at 2 and 4 weeks after surgery. In addition, the plasma GLP-1 in SG+JILB group was significantly higher than those in SG+Sham group 4 weeks after surgery. In addition, we

observed intestinal atrophy in the bypassed intestinal segment in SG+JIB group, but not in SG+JILB group, after surgery.

**Conclusions:** SG+JILB leads to better diabetes remission than SG alone without additional weight loss, which probably due to beneficial incretin effect induced by JILB. In addition, JILB does not cause blind loop syndrome as SG+JIB procedure does.

#### A159

##### **Comparison of Lateral Stomach Extraction Techniques for Laparoscopic Sleeve Gastrectomy: No Need to Bag It**

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**Background:** Retrieval bags use to extract the resected lateral stomach are generally believed to prevent wound complications during sleeve gastrectomy. Noncomparative studies have suggested no benefit to the use of extraction bags. Currently, no evidence compares outcomes for techniques utilizing a bag versus unprotected extraction.

**Methods:** Sleeve gastrectomies that were performed at two high-volume bariatric centers of excellence over the past 7 years were evaluated. Cases where an extraction bag was used (+EB) were compared to bag-less extraction via a 12mm port (-EB, Figure). Port closure techniques were standardized. Outcomes evaluated included contamination, surgical site infections and extraction-site hernias.

**Results:** 674 patients were evaluated with 417 in the +EB group and 257 in the -EB group. There were no differences between groups for age (43), BMI (44) or comorbidities. There was a trend toward shorter operative times with the -EB group (-EB =100 minutes vs +EB=106 minutes, p=0.07). Gross spillage was documented as a contaminated case in 1.9% of -EB cases compared to 0.2% in +EB cases (p=0.7). There were only two superficial surgical site infections in each group (0.4%+EB vs 0.7%=-EB, p=0.38) and one post-operative abscess in -EB and none in +EB (p=0.69). One extraction site hernia was seen in each group (p=0.53). Average cost of extraction bags and institutional cost of one-minute operating room time results in average cost savings \$658.00 per case.

**Conclusions:** Stomach extraction can safely be performed without an extraction bag without increased morbidity. Bag-less extraction is a safe and resource conscience method.

#### A160

##### **Gastroesophageal reflux disease outcomes in patients undergoing laparoscopic sleeve gastrectomy and concurrent hiatal hernia repair**

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**Introduction:** Hiatal hernia is present in up to 40% of patients with obesity. Whether HH repair (HHR) concurrent with laparoscopic sleeve gastrectomy (LSG) resolves preoperative GERD and prevents development of postoperative GERD is unclear. This study describes changes in GERD symptoms in patients undergoing LSG and HHR.

**Methods:** A retrospective chart review revealed 238 patients who underwent LSG and concomitant HHR from 2005 to 2018. Patients were considered to have GERD if they were symptomatic and receiving anti-reflux medication (PPI or H2 antagonist daily).

**Results:** 30% of hiatal hernias were diagnosed preoperatively. The technique of HHR included posterior crural repair (89.5%); anterior crural repair (8%); both anterior and posterior repair (2.5%); bioabsorbable mesh (2.5%); use of pledgets (11%); and placement of esophagopexy crural stitches (3%). Overall, 47.9% of patients were found to have GERD preoperatively and 40.8% postoperatively. GERD resolved in 56/114 (49.1%) patients with preoperative GERD after a median time of 14.1 months (range: 14-2393 days). Of the 124 patients without GERD preoperatively, 39 (31.5%) developed de novo GERD after a median time of 30.3 months (range: 76-2779 days). The group with postoperative GERD included more patients with preoperative GERD (59.8% vs. 39.7%,  $p=0.002$ ) and more women (92.8% vs. 83%,  $p=0.027$ ) relative to the group without postoperative GERD.

**Conclusions:** LSG and concurrent HHR leads to resolution of symptoms in nearly 1 in 2 patients with GERD preoperatively and development of new symptoms in 1 in 3 patients. HHR at the time of LSG does not guarantee resolution of GERD.

## A161

### **A prospective randomized study of an Enhanced Recovery After Surgery (ERAS) pathway in patients undergoing laparoscopic sleeve gastrectomy**

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**Background:** Enhanced recovery after surgery (ERAS) aligns the practice of anesthesia with the care given by the surgical team before, during, and after surgery. In bariatric surgery, randomized clinical trials (RCT) on ERAS are few. We report the results of an RCT testing an ERAS protocol incorporating a novel multidrug strategy in patients undergoing laparoscopic sleeve gastrectomy (LSG).

**Methods:** 132 patients undergoing LSG between March 2018 and January 2019 were randomized to either standard of care (SOC; N=65) or ERAS (N=67). Ten patients were excluded due to protocol violation. ERAS included a pre- and post-surgical medication regimen designed to reduce postoperative nausea, vomiting and opioid use. Groups were compared on time from arrival to the post-anesthesia care unit (PACU) until ready for discharge (RFD); measured on an objective 5-point scale including vital signs, liquid intake, nausea and vomiting

score, pain score and ambulation). Outcomes included post-operative use of opioids and rescue anti-emetics and 30-day unanticipated LSG-related events.

**Results:** Final analysis included 57 patients in SOC and 65 in ERAS (Table 1). No significant differences were observed on demographics or comorbidities present at time of LSG. Times from PACU to RFD5 and from PACU to discharge were significantly shorter for ERAS as was hospital length of stay. Opioid use was significantly lower for ERAS with no significant differences in postoperative rescue anti-emetics or 30-day events.

**Discussion:** After LSG, ERAS patients achieved RFD status faster and used opioids less frequently and in lower amounts without a significant increase in 30-day events.

## A162

### **Investigation of Laparoscopic Sleeve Gastrectomy with and without concurrent Paraesophageal Hiatal Hernia Repair utilizing the ACS MBSAQIP**

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**Background:** Management of paraesophageal hiatal hernia alongside weight reduction surgery is a topic of continued investigation. We present a query of national bariatric surgery data investigating the efficacy of concurrent laparoscopic sleeve gastrectomy and paraesophageal hiatal hernia repair (LSGPEHR) as compared to laparoscopic sleeve gastrectomy (LSG).

**Methods:** Patients were identified from the 2016 American College of Surgeons Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (ACS-MBSAQIP). Laparoscopic sleeve gastrectomy was identified by Current Procedure Terminology (CPT) code 43775 and subdivided by presence or absence of concurrent laparoscopic paraesophageal hiatal hernia repair by codes 43280, 43281, and 43282.

**Results:** 338,061 patients (271,374 LSG, 66,687 LSGPEHR) were identified. Significantly elevated rates of preoperative gastroesophageal reflux disease were noted among the LSGPEHR cohort, as were rates of diabetes, hypertension, and venous stasis ( $p < .05$ ). Concurrent repair of paraesophageal hiatal hernia was associated with increased length of surgery, staple line reinforcement, and oversewing with shortened sleeve-pylorus distance. Postoperative complication rates were comparable however increased rates of postoperative vein thrombosis and wound disruption were observed in the LSGPEHR group. Statistically significant but small increases in readmission and reoperation rates were also observed with concurrent repair.

**Conclusions:** Our findings represent the first published study investigating the 2016 ACS MBSAQIP database pertaining to laparoscopic sleeve gastrectomy and paraesophageal hiatal hernia repair. Evidence suggests both techniques are comparable, with few significant clinical differences in perioperative course. The decision to repair paraesophageal hiatal hernia during laparoscopic sleeve gastrectomy appears to be safe and efficacious however surgeon familiarity should guide intraoperative decision making.

### **A163**

#### **Simultaneous hiatal hernia repair during laparoscopic sleeve gastrectomy is not associated with increased complications**

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#### Background:

Presence of GERD and hiatal hernia in morbidly obese patients is well. Limited data is present on the safety profile and outcomes of simultaneous repair of hiatal hernia (HR) during laparoscopic sleeve gastrectomy (LSG). Discussions are present on the concerns of increased leak rates due to crural dissection. We investigated the effect of simultaneous hiatal hernia repair in LSG(HR-LSG) on perioperative outcomes.

#### Methods:

MBSAQIP 2016 was used as the data source. Patients who underwent LSG and LSG-HR were identified. The effect of HR-LSG on outcomes, leak rates, sepsis, readmission rate, reoperation rate, ICU admission, overall complication rates, and 30-day mortality were analyzed with binary logistic regression. Hospital stay and length of operation were analyzed with linear regression models.

#### Results:

107,726 patients were identified. 79.2% were female, mean age was 44.4 years. 14.6% (15,764) underwent HR-LSG. 30-day mortality was 0.1%(71), no difference was seen between LSG vs HR-LSG (p=0.531). ICU admission rate was 0.5% (522), (p=0.379), leak rate was 0.7% (764), (p=0.222), readmission rate was 0.3% (3,289), (p=0.254), and reoperation rate was 0.8% (881), (p=0.183). A significant difference was seen in mean operative length for LSG vs.HR-LSG which was 71.48 minutes and 79.82 minutes respectively (slope coefficient 1.406, p=0.042). Mean hospital stay was 1.49 days for LSG vs 1.59 for HR-LSG (p=0.548).

#### Conclusion:

Simultaneous repair of hiatal hernia during sleeve gastrectomy is safe and not associated with an increase in perioperative complication rates or mortality. It was also not found to effect length of hospital stay.

### **A164**

#### **A COMPREHENSIVE APPROACH FOR THE PREVENTION OF POSTOPERATIVE NAUSEA AND VOMITING FOLLOWING SLEEVE GASTRECTOMY: A RANDOMIZED CONTROLLED TRIAL**



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**Introduction:** Postoperative nausea and vomiting (PONV) following sleeve gastrectomy (SG) is a common occurrence. The effect of specific interventions in PONV prevention within enhanced recovery pathways remains unclear. We aimed to evaluate the impact of a comprehensive approach (INT) on the prevention of PONV-related hospital resource utilization and severity.

**Methods:** A prospective randomized trial was conducted for patients undergoing SG in a tertiary care academic medical center. The INT group received aprepitant and transdermal scopolamine preoperatively followed by ondansetron and dexamethasone intraoperatively, along with total intravenous anesthesia with propofol. The control group received inhalational anesthetic, two intraoperative antiemetics without preoperative prophylaxis. The primary endpoint was PONV-related delay in hospital discharge (length of stay (LOS)>1 day).

**Results:** 83 patients completed the study (41 in the INT and 42 in the control group). 66% were female with a BMI of 46.8±6.9. 89% of patients were discharged home on the first postoperative day. Four patients in the control group and none in the INT group experienced a PONV-related delay in discharge (9.5% vs 0, p=0.119). One INT patient presented to the ED for PONV and released home; there were no PONV-related hospital readmissions. The severity of PONV was significantly lower, and quality of recovery higher in the INT group (Figure).

**Conclusions:** A multilevel approach to PONV leads to significantly lower severity of PONV and improved self-reported quality of recovery, compared to control. PONV-related readmissions, ED visits and discharge delays were uncommon within the specific overall enhanced recovery cohort.

## A165

### **LONG TERM RESULTS AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY WITH CONCOMITANT POSTERIOR CRUROPLASTY: FIVE-YEAR FOLLOW-UP UPDATE**

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Hiatal hernia (HH) repair during laparoscopic sleeve gastrectomy (LSG) has been advocated to reduce postoperative gastroesophageal reflux disease (GERD) and/or intrathoracic migration (ITM) incidence. Previous, mid-term results of a prospective, comparative study evaluating posterior cruroplasty concomitant with LSG (group A 48 patients with simple vs. group B 48 reinforced with bioabsorbable mesh) confirmed the safety and effectiveness of simultaneous procedures. Present aim: to report the 60 months follow-up update, evaluating GERD, esophageal lesions' incidence and HH's recurrence. Results: Follow-up of was completed in 79.5% of the patients. Recurrent GERD in 6/32 (18.8%, group A) and in 9/44 (20.5%, group B)

was registered ( $p>0.05$ ). Grade A esophagitis and GERD was shown in 2 patients (6.25%), respectively 2 (4.5%) of each groups ( $p>0.05$ ), and recurrent HH was confirmed later by contrast study and CT scan. Neither Barrett's lesions nor de novo GERD were found. A total of 12 patients (12.5%, 8 respective 4) were converted within five years for persistent/recurrent GERD, with only 1 case of de novo (group B, shown in the initial 21 months follow-up). Failure of the initial cruroplasty with ITM was recorded in 4 patients (13% for group A and 7.4% for group B); hence, a repeat posterior, reinforced cruroplasty with bioabsorbable mesh was performed. Conclusions: Accurate patient selection (no large HH, no severe esophagitis), proper sleeve technique combined with posterior cruroplasty (simple or reinforced, based on hiatal defect's dimensions and quality of the crura) ensures effectiveness, with a rate of failure (recurrence) at five years of 9.1%.

## A166

### **Ambulatory Bariatric Surgery And Risk For Adverse Events**

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**Background:** With improved outcomes following laparoscopic weight loss surgery (Roux-en-Y gastric bypass [RYGB] and sleeve gastrectomy [SG]) there is increased focus on decreasing post-operative length of stay (LOS). Previous reports indicate higher 30-day mortality and serious complications following ambulatory (AMB) RYGB procedures. We sought to assess outcomes following AMB-RYGB or SG using the MBSAQIP® data registry.

**Methods:** Participant user files from MBSAQIP were reviewed for patients undergoing AMB-RYGB or SG (2015-17). Patients were grouped as AMB (LOS1d). Exclusion criteria were LOS >4d, Age 75yrs, revision surgery, gastric banding, BMI

**Results:** After exclusions, 408,895 patients remained (2.43% AMB). 111,270 patients underwent RYGB (1,032 AMB) and 297,616 SG (8,941 AMB). After multivariate logistic regression adjusted for comorbidities and matching, no patients were lost in the AMB arm and demographics/comorbidities were similar. Analysis of 30-day mortality, reoperation, or readmission demonstrated no increased risk in AMB-RYGB vs. non-AMB-RYGB ( $p=0.5986$ ,  $p=0.4587$ ,  $p=0.1571$  respectively), and no differences in major/minor complications. Analysis of AMB-SG revealed no differences in 30-day mortality, reoperation, or readmission ( $p=0.0832$ ,  $p=0.3117$ ,  $p=0.8247$  respectively) vs. non-AMB-SG. Non-AMB-RYGB and SG patients had fewer drains placed, and non-AMB-SG patients were less likely to have unplanned ICU admissions ( $p=0.0050$ ).

**Conclusion:** This analysis using the MBSAQIP database demonstrates comparable safety between AMB vs. non-AMB-RYGB and SG with minimal or no increased risk of major or minor complications.

## A167

### **The Definition of Elderly in Bariatric Surgery Practice**

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**Background:** The elderly patients are dubbed to have worse postoperative outcomes than their younger counterparts. The cut-off age defining the elderly in bariatric surgery has not been characterized. The aim of this study was to determine the age cut-off that best describes the elderly patients at which the outcome worsens after primary bariatric surgery.

**Patients and Methods:** The MBSAQIP database for years 2015 and 2016 was used to identify primary Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) patients. Patients  $\geq 30$ -years old and with a body mass index of 30-70 kg/m<sup>2</sup> were included. The receiver operator characteristic (ROC) curves were plotted to assess the cut-off age for the 30-day postoperative mortality and the composite serious morbidity.

**Results:** A total of 224,204 patients were included in the study, of which 156,768 (69.9%) had SG and 67,436 (30.1%) had RYGB. The median age was 46.2-years (interquartile range, 39-55) with a female predominance of 177,114 (79%) patients. The age range between 47 and 50 had the highest Youden index to predict early postop mortality and serious morbidity (Table 1). However, the c-statistics were consistently  $< 0.7$  indicating poor discrimination.

**Conclusion:** ROC curve analysis failed to point-out a cut-off age corresponding to a point for worsening of early postoperative outcomes by increasing age. This might be due to appropriate elderly patient-selection practice in the MBSAQIP-accredited centers. Findings of this study would suggest that patients should not be denied bariatric surgery based on their chronological age, rather would be assessed for functional capacity and physiologic reserve.

## A168

### **Assessing Post-operative Nausea and Vomiting After Bariatric Surgery Using a Validated Questionnaire**

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**Background:** Post-operative nausea and vomiting (PONV) is known to occur after bariatric surgery, with over two-thirds of patients affected. However, variability exists in how to

objectively measure PONV. The goal of the present study was to use a validated scoring tool, the Rhodes Index of Nausea, Vomiting, and Retching(Rhodes) to measure PONV after bariatric surgery.

Methods: Washington University Weight Loss Surgery(WUWLS) surveyed patients from 11/01/2017 to 11/01/2018 at 6 different timepoints: post-operative day(POD)0, POD1, POD2, POD3-4, the first post-operative outpatient visit(~POD7), and the second post-operative visit(~POD40). A Rhodes score was calculated from the sum of 8 validated questions(Table 1) after laparoscopic sleeve gastrectomy(LSG) and laparoscopic Roux-en-Y gastric bypass(LRYGB).

Results: A total of 309 patients completed 695 Rhodes questionnaires were completed. Rhodes questionnaires were completed 297 times by patients after LSG and 398 times by patients after LRYGB. On POD0 and POD1, patients had significantly worse Rhodes scores after LSG compared to LRYGB(Figure 1). Using linear regression assessing procedure, gender, age, and other factors, WUWLS found that LSG( $\beta=3.72$ ,  $t$ -statistic=6.98,  $p<0.001$ ), female gender( $\beta=2.33$ ,  $t$ -statistic=3.28,  $p=0.001$ ), and absence of gastroesophageal reflux disease(GERD,  $\beta=1.39$ ,  $t$ -statistic=2.46,  $p=0.01$ ) were associated with higher Rhodes scores POD0 and POD1.

Conclusions: This is the largest study using a validated questionnaire to objectively measure PONV after bariatric surgery. The factors found to be most associated with PONV were LSG, female gender, and absence of GERD. These data may help bariatric surgery programs, including WUWLS, identify patients who may require more intensive treatment of PONV, particularly POD0 and POD1.

## A169

### **Preoperative taste-related activation in the VTA correlates with weight loss in patients who receive Roux-en Y gastric bypass but not vertical sleeve gastrectomy.**

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Background: Changes in taste preference for palatable stimuli have been reported following bariatric surgery. To investigate the reward-based neural mechanisms for such changes, we measured behavioral and neural responsiveness to varying concentrations of sugar and fat-containing tastants in patients before and 6 months after vertical sleeve gastrectomy (VSG; N=23) or Roux-en Y gastric bypass (RYGB; N=19), respectively.

Methods: Preoperatively, patients rated 12 taste stimuli of varying sugar and fat content on a visual analog scale, and underwent functional magnetic resonance imaging while randomly

presented with : high fat, or high sugar or tasteless stimuli, or the patient's preferred tastant. Body weight was assessed 6 months postoperatively, and correlated with BOLD responses centered on the ventral tegmental area (VTA; pFWE <0.05).

Results: Presurgical VTA BOLD responses to high fat, high sugar, or the preferred tastant negatively correlated with weight change at 6 months after undergoing RYGB. Subjects with lower VTA response to palatable stimuli prior to RYGB lost more weight than those who exhibited higher responses. Presurgical VTA BOLD responses did not correlate with postoperative body weight changes in patients who underwent VSG.

Conclusion: Exposure to high calorie, highly palatable foods decreases activation in reward-based brain regions in the obese. Anatomical and metabolic changes associated with RYGB may reset the processing of rewarding stimuli. Individuals with a dampened response to food in reward-based regions such as the VTA may be more likely to benefit from RYGB. Alterations in neural responsiveness to reward may correlate with behavior change and greater weight loss (supported by 1K23DK100559).

## **A170**

### **Prolonged Dietary Insurance Requirements Reduce Post-Operative Weight Loss after Sleeve Gastrectomy**

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West Virginia University<sup>1</sup>

Background: The length of insurance-mandated medically supervised diet programs for precertification of bariatric surgery varies significantly. In the state of West Virginia policies range from 3 months to 12 months of insurance-mandated medically supervised diet. The current study examined the effects of prolonged insurance-mandated medically supervised diet on weight loss results three months after sleeve gastrectomy.

Methods: 195 patients who underwent laparoscopic sleeve gastrectomy over a 12 month period within an accredited university based practice were used for the study. All patients underwent a medically supervised nutrition program and were categorized into three groups, those that had 3 months or less (N=38), 4 to 6 months (N=116), and greater than 6 months (N=41). The percentage of excess weight loss (%EWL) was compared across the three groups using Analysis of Variance (ANOVA).

Results: The %EWL from initial consult to day-of-surgery increased with increasing insurance-mandated requirements (5.07 ± 8.24%EWL for 3 months, 7.84 ± 8.77%EWL for 4 to 6 months, 11.34 ± 9.49%EWL for 6+ months F=5.04, p=0.01). Inversely, the %EWL three months after operation decreased with increasing insurance-mandated requirements (39.72 ± 11.64%EWL for

3 months,  $35.85 \pm 11.18\%$ EWL for 4 to 6 months,  $27.70 \pm 10.54\%$ EWL for 6+ months;  $F=12.54$ ,  $p=0.00$ ).

**Conclusion:** Longer insurance-mandated medically supervised nutrition requirements led to increased preoperative weight loss. Even with accounting for increased preoperative weight loss, patients having longer medically supervised nutrition requirements achieved lower 3 month postoperative weight loss. Delaying bariatric surgery for additional preparation time beyond 3 months does not improve postoperative weight loss and in this study was detrimental.

## A171

### Mid-bowel Transit is Prolonged in Patients with Failed Weight Loss Response to Gastric Bypass

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**Background:** Weight loss success after gastric bypass (GB) is commonly attributed to stomach size and ileal hormone stimulation (i.e.GLP-1,PYY). Inherent to these factors is nutrient transit. Remarkably, there are no reference ranges for proper gastric emptying (GE) or small bowel transit (SBT) times after GB. The objective of this study was to identify GE and SBT times in subjects with failed and successful weight loss response after GB.

**Methods:** Subjects with failed weight loss response (excess body weight loss;EBWL<40%) and successful response (EBWL>60%) at least 18-months after GB underwent six hour GE and SBT scintigraphy with standardized semi-solid meal to identify the following time points: GE 10% (TG<sub>10%</sub>) and 50% (TG<sub>50%</sub>), Intestinal Max (T<sub>IntMax</sub>), Duodenal-Ileum transit (T<sub>DI-transit</sub>), Ileum 10% (T<sub>Ileum10%</sub>), Cecal Filling Initiation (T<sub>CecalFilling</sub>) and Ileocecal Valve transit (T<sub>ICV-transit</sub>). Values are reported as minutes; median[range] for GE, mean±SD for SBT.

**Results:** 30 subjects with failed response (mean EBWL=22±13%) and 10 with successful response (mean EBWL=70±12%) were studied. Scintigraphy findings were as follows: TG<sub>10%</sub>=1 min [all subjects]; NS, TG<sub>50%</sub>=1 vs. 1 min [1-150]; NS, T<sub>IntMax</sub>=143±80 vs. 63±55 min;  $p=0.002$ , T<sub>Ileum10%</sub>=214±85 vs. 119±70 min;  $p=0.002$ , T<sub>DI-transit</sub>=212 ± 87 vs. 118±70 min;  $p=0.002$ , T<sub>ICV-transit</sub>=36±16 vs. 39±27;  $p=0.744$ , T<sub>CecalFill</sub>=244±158 vs. 158±77;  $p=0.008$ .

**Conclusions:** Subjects with failed weight loss response to GB had an approximate 2-3 times prolonged transit time from jejunum to ileum. No significant differences were identified in GE or amount of time nutrient resided in ileum. These findings implicate the importance of mid-bowel transit to the metabolic response observed after GB.

## A172

## **The Role of Bariatric Surgery in Patients with Obesity and Advanced Heart Failure as a Bridge to Heart Transplantation: A Systematic Review and Meta-Analysis**

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McMaster University<sup>1</sup> McMaster University School of Medicine<sup>2</sup>

### **Background:**

Class 3 obesity or greater (BMI >35 kg/m<sup>2</sup>) is a relative contraindication for heart transplant due to its perioperative risk and mortality. Bariatric surgery has been explored as a potential bridging procedure to transplant by facilitating weight loss and improving cardiac function. The aim of this systematic review and meta-analysis is to investigate the role of bariatric surgery on improving transplant candidacy in patients with ESHF.

### **Methods:**

MEDLINE, EMBASE, CENTRAL, and PubMed databases were searched up to February 2019 for studies that performed bariatric surgery on patients with severe obesity and ESHF. Key outcomes included rate of patients listed for heart transplantation after bariatric surgery, rate of patients subsequently receiving transplant, change in BMI after bariatric surgery, 30-day complications. Pooled estimates were calculated using the random effects meta-analysis of proportions. MINORS tool was used to assess quality of evidence.

**Results:** 10 studies with 92 patients were included. Mean (SD) preoperative BMI was 45.1 (5.1) kg/m<sup>2</sup> and BMI after surgery was 33.8 (4.0) kg/m<sup>2</sup> with absolute BMI loss of 25.1%. After bariatric surgery, 69% (95%CI, 48%-88%) of patients with ESHF were listed for transplantation. Time to bariatric surgery to receiving heart transplant was 12 (13-20.5) months. Of the listed patients, 67% (95%CI, 45-86%) successfully received heart transplant. The rate of 30-day bariatric surgery-related complications was 18% (95%CI 6%-33%) and rate of 30-day mortality after bariatric surgery was 0%.

### **Conclusion:**

Bariatric surgery can facilitate sustained weight loss in obese patients with ESHF, thus improving heart transplant candidacy and transplantation.

## **A173**

### **Safety of Bariatric Surgery in Patient with Chronic Liver Disease: a Nationwide Study**

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University of Oklahoma College of Medicine - Tulsa<sup>1</sup> University of Oklahoma College of Medicine - Oklahoma City<sup>2</sup>

**Background:** Chronic liver disease (CLD) is a risk factor for surgical complications and can be a relative contraindication to bariatric surgery. This study evaluates early outcomes after bariatric

surgery in patients with CLD with and without liver cirrhosis(LC).

**Methods:** In a retrospective analysis of 2012–2016 Healthcare Cost and Utilization Project-National Inpatient Sample, adult patients with obesity undergoing laparoscopic sleeve gastrectomy(SG) or Roux-en-Y gastric bypass(RYGB) were studied. CLD and LC were identified along with patient comorbidities. Outcomes were Long Hospital Stay (LHS) defined as  $\geq 5$  days (as a proxy of complicated course), blood product transfusion, total hospital charges, and in-hospital mortality. Binary logistic regression was used for multivariate analysis(MVA).

**Results:** 139,952 patients were analyzed (RYGB 36.6%, female 78.6%, age  $44.7 \pm 12$  years). CLD was listed in 17,423(12.4%) patients, including 818(0.6%) with LC. Non-alcoholic fatty liver disease was the most common cause of CLD. Patients with LC were more likely to be older, male, and have diabetes mellitus and hyperlipidemia. 37.7% of LC and 42.1% of non-cirrhotic CLD patients underwent RYGB. Transfusion, LHS, and total charges were higher in the LC group(Table). In-hospital mortality was higher in CLD(0.1%) and LC( $<0.3\%$ ). In MVA, LC was an independent predictor of LHS (Odds Ratio(OR):1.82, 95%CI:1.25-2.67) but non-cirrhotic CLD was not a predictor of LHS. Subgroup MVA in CLD showed RYGB was independently associated with LHS (OR:1.85, 95%CI:1.53-2.25).

**Conclusions:** Bariatric surgery can be performed safely in appropriately selected patients with non-cirrhotic CLD and LC. Further studies are needed to assess long-term outcomes of bariatric surgery in CLD.

#### A174

##### **Evaluation of the Impact of Pre-Operative Glycemic Status on Outcomes Following Bariatric Surgery in Patients with Obesity and Diabetes**

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**Introduction:** Preoperative glycemia as reflected by out-of-range hemoglobin A1c (HbA1c)  $\geq 8$  has been linked to adverse outcomes. Since bariatric surgery improves glycemia, benefits may exist for patients with obesity and out-of-range diabetes.

**Methods:** Patients who underwent bariatric procedures at our MBSAQIP Center from February 2017-December 2018 with known diabetes and a preoperative HbA1c were divided into three groups: (A) HbA1c  $\leq 6.5$ , (B) HbA1c 6.6-7.9, and (C) HbA1c  $\geq 8$ . We compared: demographics, comorbidities, procedures, and outcomes (30-day, 60-day, 1-year). Protocolized inpatient glycemic management with insulin was utilized as necessary.

**Results:** Eight hundred eighty-three patients underwent bariatric procedures and 179 were included: Group A – 62 (35%), Group B – 61 (34%), and Group C – 56 (31%). Mean preoperative HbA1c was 5.8, 7.2, and 9.3, respectively. There were significantly more females in all groups (87%, 62%, and 64%, respectively,  $p=0.00396$ ). Group A patients were significantly younger (45, 52, and 51 years, respectively,  $p=0.00126$ ). There was no significant difference in mean BMI (42.9, 44.2, 43.1), modality (laparoscopic [65%, 74%, 71%], robotic [35%, 26%, 29%]) or procedure (sleeve gastrectomy [71%, 59%, 68%], Roux-en-Y gastric bypass [23%,



28%, 27%], band removal [6%, 10%, 5%]). Three 30-day SSIs occurred (Group A, n=1; Group B, n=2). There was no significant difference in 30-day (3, 3, 2), 60-day (0, 0, 2), or 1-year (1, 1, 1) events. One 30-day mortality occurred in Group B (opioid overdose).

**Conclusion:** Out-of-range HbA1c may not directly correlate to adverse outcomes after bariatric surgery. Clinical judgement in such cases is warranted.

## A175

### **5-year Retention, Attrition and Predictors of Participation in the Longitudinal Assessment of Bariatric Surgery (LABS-2) Study**

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University of Pittsburgh Medical Center<sup>1</sup> University of Pittsburgh<sup>2</sup> University of Pittsburgh Medical Center<sup>3</sup> Sanford Research<sup>4</sup> Weill Cornell Medicine<sup>5</sup> Oregon Health and Science University<sup>6</sup> East Carolina University<sup>7</sup>

**Background:** Reporting bariatric surgery outcomes, including adverse events, depends on participant retention, data validity and completeness.

**Method:** The Longitudinal Assessment of Bariatric Surgery-2 (LABS-2) study enrolled 2458 adults undergoing a first bariatric surgical procedure at one of 6 US sites. Research assessments were conducted pre-surgery and annually post-surgery. Multiple retention strategies including flexible scheduling, alternative research assessment sites, home visits, telephone interviews, increased reimbursement, and shorter assessment option for high-priority data were implemented to enhance retention and data completeness. A mixed-effect multinomial logistic regression model identified pre-surgery factors independently related to study participation (i.e. in-person, remote or missed/inactivated assessments), adjusting for site, calendar year, and follow-up timepoint.

**Results:** Table 1 shows follow-up assessment status by time point. The modeled percentage of missed assessments plus inactivations increased from 14.7% to 21.8% between Year 1 and 2, then stayed relatively stable through year 5 (20.8%-19.6% in Years 3-5). Most mental health-related measures were not independently associated with study participation. Younger participants, males, whites, smokers, illicit drug users, those reporting less than very good general health, and who reported higher weight loss expectations, independently had a higher likelihood of a missed/inactivated versus in-person assessment across follow-up.

**Conclusion:** The percentage of participants who missed an assessment or were inactivated did not increase after Year 2, perhaps due to implementing of an increasingly robust retention plan. The identified predictors of missed/inactivated assessments highlight sub-groups to target for focused retention efforts. Flexibility in data collection may minimize participant burden, and reduce missed assessments and incomplete data.

## A176

### **Incidence of pre- and postoperative chronic pain in bariatric patients.**

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**Introduction:** An increasing number of patients with morbid obesity are referred for surgery whereby pain management pre- and postoperative seems to be increasingly important. However, little is known about the incidence of pre and postoperative chronic pain.

**Objectives:** To analyse the effect of pre and post operative pain in bariatric patients.

**Method:** This is a retrospective database research and a prospective questionnaire. NRS was scores and questionnaires pre-operative and just after the intervention are taken from the electronic patient file.

**Results:** 3297 patients responded Of these 83.1% had a RYGB operation. Pre-operative chronic pain showed an incidence of 10.5%. Pre-operatively, most of the pain occurred in the back, pelvis. In 2.2% (n = 73) of the cases pre-pain already occurred in the abdomen. The incidence of post-operative chronic pain was 8.1% (n = 267) with an average VAS of  $5.9 \pm 1.9$ . Post operatively most pain occurred in the abdomen (4.5%) and there was a clear decrease in the percentage of joint pain. Of all respondents, 1.7% of patients had both pre- and post-operative pain. With this, an incidence of + 6.4% new chronic post-operative pain was measured and at the same time a decrease in chronic pain compared to pre-operative of -8.8% in a proportion of the patients surveyed.

**Conclusion:** This study shows that there is a clear decrease in chronic pain after bariatric surgery (-8.8%). However, the results also show that there is an increase in new chronic pain (+ 6.4%).

### **A177**

#### **Better or Worse? A State-wide Analysis of Patient Reported Reflux Symptoms Before and After Bariatric Surgery**

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University of Michigan<sup>1</sup>

**Introduction:** Gastroesophageal reflux can improve or worsen after bariatric surgery depending on procedure type. Our goal was to compare patient reported symptoms of reflux after gastric bypass (GB) and sleeve gastrectomy (SG) based on preoperative symptom severity. **Methods:** This study analyses data from a state-wide bariatric-specific registry that utilizes a validated patient-reported gastroesophageal reflux survey with symptom scores that range from 0 (no symptoms) to 5 (severe symptoms). We included 10,554 patients who completed a survey both at baseline and at 1 year following bariatric surgery between 2013 and 2017. We compared the incidence of improving and worsening reflux symptoms after GB and SG based on baseline symptoms. **Results:** Overall improvement of reflux symptoms occurred in 30.4% of patients after SG and 30.8% after gastric bypass (p=0.7015). Patients with a baseline score of 0 (no symptoms) were more likely to develop new onset symptoms at one year after SG than GB

(21.0% vs 7.6%,  $p < 0.0001$ ). Patients with a baseline score of 1-4 had a significantly higher likelihood of improved symptoms after GB than SG (see figure,  $p < 0.001$  for all analyses). Baseline severity of symptoms did not correlate with procedure type (Pearson's  $-0.05263$  for GB and  $0.05263$  for SG). **Conclusions:** Both SG and GB improved reflux symptoms after surgery with GB demonstrating superior results. We found no correlation between preoperative reflux symptom severity and procedure choice. Using a validated patient survey for gastroesophageal reflux can help set appropriate expectations of symptoms after bariatric surgery.

## A178

### **Intra-thoracic Gastric Fistula after Bariatric Surgery: A Systematic Review and Pooled Analysis**

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**Background:** Laparoscopic bariatric surgery is the stand-alone treatment for morbid obesity. However, complications such as leak/fistula can be fearsome.

**Objectives:** We aim to perform a systematic analysis of studies on intra-thoracic gastric fistula (ITGF) after bariatric surgery.

**Methods:** A comprehensive Pubmed/Medline search was conducted through March 2019 to retrieve papers describing management of ITGFs after a bariatric procedure.

**Results:** A total of 25 studies were included comprising a total of 182 patients (80.62% female 19.37% male). Laparoscopic sleeve gastrectomy (LSG) was performed as the primary procedure in 84.6% of the patients followed by roux-en-y gastric bypass (RYGB) in 8.7%, vertical banded gastroplasty in 2.19%, laparoscopic adjustable gastric banding in 1.6%, and other procedures in 5 patients (2.6%). The gastro-bronchial fistula was the most common type of ITGF (31.31%) followed by gastro-pleural fistula (2.7%), gastro pulmonary fistula (7.1%), gastro pericardial fistula (1.64%), and gastro-colic and gastrosplenic fistula (each in 1 patient, 0.5%). The most common presenting symptoms included cough (43.75%), chest/abdominal pain (38.75%), and dyspnea (27.5%). Time to diagnosis ranged from 3 days to 156 months. Surgical resection (57.5%) and endoscopic closure (47.5%) were the most successful treatment modalities. Complete resolution was reported in 71.25% of the patients. Treatment failure occurred in 3 cases of gastro-bronchial, and 1 case of gastro-pulmonary and gastro-pericardial fistula. One case of death was reported in a patient with gastro-pulmonary fistula.

**Conclusions:** Timing of the fistula's presentations has challenges to diagnosis and treatment. With a step-by-step approach, patients have a desirable outcome in the long-term follow-up.

**A179**

**Concomitant Bariatric Surgery and Paraesophageal Hernia Repairs Using Bioabsorbable Matrix**

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**Introduction:** Paraesophageal and sliding-type hiatal hernias are extremely common in patients who suffer from obesity. Concomitant hernia repairs at the time of bariatric surgery have been reported in as high as 20% of all bariatric surgeries. Bioabsorbable tissue matrices have been used to bolster and enhance sutured paraesophageal hernia defects and reduce local recurrences. To date there exists no large volume study assess outcomes of hiatus hernias repaired at the time of concomitant bariatric surgery, particularly with respect to the use of bioabsorbable tissue matrix.

**Methods:** A single institution retrospective review of a prospectively maintained database was used to identify patients from January 2014 through February 2019 who underwent either gastric sleeve or roux-en-y gastric bypass in addition to hiatal hernia repair with or without bioabsorbable tissue matrix (mesh) reinforcement. A total of 420 patients were included for analysis. Outcomes including post-operative recurrence as confirmed by imaging or endoscopy, reoperation for hiatus hernia, and need for PPI post operatively were assessed.

**Results:** There were no reoperations for hiatal hernia at an average follow-up of 26.3 months. Total hiatal hernia recurrence rate was 2.4%. Recurrence rates were higher for all procedures if performed without mesh and significantly higher without mesh ( $p=0.0127$ ) if the bariatric procedure was a sleeve. There was a decline in the need for PPI's from 41% to 9% over the course of three post-operative years.

**Conclusions:** Bariatric surgery with concomitant hiatal hernia repair is safe and durable, particularly if performed with absorbable tissue matrix reinforcement.

**A180**

**Perioperative Antidepressant Usage in Bariatric Patients Decreases Obesity-Related Stigma and Improves Body-Esteem**

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Prisma Health<sup>1</sup> University of Utah<sup>2</sup> Clemson University<sup>3</sup>

**Introduction:** The stigma of the disease of obesity has shown to contribute to patients' poor self-esteem regarding their body-image. There are few studies exploring the differences in perceived obesity related stigma (ORS) and body esteem in preoperative versus postoperative bariatric surgical patients. This study aims to elucidate contributing factors that mitigate the harm

of stigma in this population.

**Methods:** Batteries of validated questionnaires focusing on perception of ORS and body esteem were administered to 104 patients who underwent bariatric surgery. These surveys were obtained preoperatively and postoperatively at 3, 6, and 12 months intervals of follow-up. The questionnaire scoring was compared for improvement, and concomitant factors were analyzed for a potential effect on magnitude of improvement.

**Results:** Our study found significant improvement in perception of ORS and body esteem post-surgery. When considering magnitude of body esteem improvement, BMI difference pre-op vs post-op contributed with a coefficient of 0.686 ( $P=0.022$ ). Peri-operative antidepressant use correlated to the largest magnitude of improvement with a coefficient of 8.545 ( $P=0.035$ ) compared to those not taking antidepressants. 69% of the patients in this study were on psychiatric medications and 57% of the psychiatric medications used were antidepressants. There were no significant differences among socio-demographic factors such as age, gender, race, type of surgery, use of anxiolytics/hypnotics, or stimulants.

**Conclusions:** Patient perception of ORS and body esteem improves after bariatric surgery. Antidepressant use in patients who undergo bariatric surgery were more likely to demonstrate a greater magnitude of improvement in body-esteem compared to those not on antidepressants.

## A181

### **Effects of Bariatric surgery vs. medical treatment on histologically proven non-alcoholic steatohepatitis: a meta-analytical approach**

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**Introduction:** The type 2 diabetes and obesity epidemics also lead to a rapid increase of non-alcoholic steatohepatitis (NASH) with a high risk for development of hepatocellular carcinomas. Currently, there is no approved therapy for NASH except lifestyle modification. While the effectiveness of new medical therapies and bariatric surgery are investigated, there are no studies directly comparing these therapies. In this meta-analytical approach, we compare bariatric surgery with medical treatment to provide a basis for future studies.

**Methods:** We searched PubMed, Central and Web of Science for clinical trials investigating NASH in adult patients with paired liver biopsies at baseline and completion of treatment at 1-3 years. Twenty studies met the inclusion criteria of biopsy proven NASH ( $NAS>3$ ) and re-biopsy, 7 prospective surgical trials and 6 RCTs were analyzed.

**Results:** In 1120 patients, mean NAS in surgical trials was 4,1 and 4,8 in conservative studies, respectively. The pooled proportion of NASH-resolution was 84,6% (95%CI:76,5%-92,7%) after surgery and 36% (95%CI:25,4%-47,2%) after conservative intervention. In patients with  $NAS>5$ , the mean decrease in NAS was -1,3 after medical intervention and -2,6 after surgery. Ballooning improved in 85% after surgery vs. 37% and fibrosis in 64% vs. 24%. Diabetes was

present in 28%-63% of surgical patients, with postoperative remission in 50-80% compared to none in medical treatment.

Conclusion: Bariatric surgery effectively treats NASH and resolves it in >80% of patients. Despite similar baseline histology, the conclusion of higher effectiveness of bariatric surgery compared to medication is restricted and should be further investigated in RCTs.

## A182

### Identification of BMI Cut-Points Associated with Cancer Using Electronic Health Record Data

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University of Wisconsin<sup>1</sup>

**Background:** Nearly 20% of cancers are associated with obesity. However, specific BMI thresholds with which these cancers are most likely to develop have not been identified. The objective of our study was to identify whether BMI thresholds or “cut-points” exist for 14 cancers associated with obesity.

**Methods:** Patients aged 18-75 who had clinical encounters spanning a 2-year period at an integrated U.S. health system from 2008-2018 were identified from the electronic health record. Patients who were underweight (BMI < 18.5 kg/m<sup>2</sup>), pregnant, previously diagnosed with cancer, or had bariatric surgery were excluded. The 1-year incidences of 14 cancers were identified using ICD-9/10 codes. Associations between BMI and cancer incidence were evaluated with Mann-Whitney tests. To identify cut-points, BMI was treated as a screening test for each cancer, with sensitivity and specificity calculated for each 0.5 increment of BMI. Cut-points were defined as BMI thresholds that maximized Youden’s index (sensitivity+specificity-1), with an area under the receiver operating curve (AUROC)>0.6.

**Results:** We included 207,036 patients in our study; 53.3% patients were female. The average BMI was 29.1 kg/m<sup>2</sup>. Statistically significant associations between BMI and cancer incidence were identified for breast, kidney, uterine, thyroid, and pancreatic cancers (**Table**). We identified BMI cut-points for 2 of the 14 cancers: uterine (34.5 kg/m<sup>2</sup>, AUROC=0.72) and kidney (29.0 kg/m<sup>2</sup>, AUROC=0.62) cancer.

**Conclusions:** The risk of developing uterine and kidney cancer increases significantly as patients transition between overweight and class 1 obesity. Targeted screening and early weight loss interventions for these patients should be strongly considered.

## A183

### Improvement of Left Ventricular Mass Index and Ventricular Contractility in patients with obesity following rapid weight loss after Bariatric Surgery

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Cleveland Clinic Florida<sup>1</sup>

## **BACKGROUND**

Obesity is a risk factor for heart disease and has been linked to a broad spectrum of cardiovascular changes and remodeling as we previously reported. Left ventricular mass (LVM) and contractility are recognized markers of cardiac function. We aim to determine the changes of these parameters after Bariatric Surgery (BS).

## **METHODS**

In order to determine the cardiac changes in ventricular mass, ventricular contractility and left ventricular shortening fraction (LVSF), we retrospectively reviewed the two-dimensional echocardiographic parameters of patients with obesity who underwent BS at our institution. We compared the results before and after surgery.

## **RESULTS**

A total of 41 patients met the inclusion criteria. The majority were females 57.5% (23) with an average age of  $63.5 \pm 12.11$ . The estimated BMI loss at 12 months was  $48.95 \pm 28.91$ . The left ventricular mass was  $234.9 \pm 88.11$  grams before and  $181.58 \pm 52.72$  after BS ( $P=0.002$ ). The left ventricular mass index was  $101.3 \pm 38.34$  g/m<sup>2</sup> before versus  $86.70 \pm 26.65$  after BS ( $p=0.005$ ). The LVSF was  $31.05 \pm 8.82$  % before and  $36.34 \pm 8.21$  after ( $p=0.007$ ). We found a good correlation between the decrease in LVM index and BMI after BS ( $p=0.03$ ).

## **CONCLUSIONS**

Rapid weight loss after Bariatric Surgery results in a decrease of LVM index as well as an improvement in the left ventricular muscle contractility parameters. Our results suggest there that there is a left ventricular remodeling and improvement of the heart dynamics following rapid weight loss. Further studies are needed to better assess these findings.

## **A184**

### **Concurrent operations during bariatric surgery: an analysis of the MBSAQIP database 2015-2017**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

Background: Bariatric surgery is the most effective treatment of morbid obesity, diabetes mellitus and many other diseases. The American College of Surgeons tracks 30 day outcomes using the Metabolic and Bariatric Surgery Accreditation Quality Initiative Program (MBSAQIP)

database. We examined the short term outcomes of patients that undergo bariatric surgery concomitantly with other operations such as hernia repairs and cholecystectomy to determine the safety of this practice.

**Methods:** The MBSAQIP Public Use File for 2015-2017 was examined for differences in primary bariatric operations vs concurrent procedures (CP). We only used the Current Procedural Terminology (CPT) codes for gastric bypass (GB - CPT 43644) and sleeve gastrectomy (SG - CPT 43775) for our primary bariatric cases. We specifically looked for concurrent CPT codes for laparoscopic cholecystectomy (LC), and hernia repairs (HR: ventral, epigastric, incisional and inguinal). We compared operative and post operative characteristics. P was significant at  $< 0.05$ .

**Results:** Overall, there were 469,710 cases, of which 15,400 had CP. CP had higher rates of ICU admission ( $p<0.001$ ), PE ( $p<0.001$ ), transfusion ( $p<0.01$ ), acute renal failure ( $p<0.001$ ) and greater rates of readmission, reoperation and intervention ( $p<0.001$ ). Operative times were significantly longer for CP (121.6 vs 87.5 min,  $p<0.001$ ) and had a longer length of stay (1.98 vs 1.72 days). SG had a higher rate of CP vs bypass (65.8% vs 34.2%,  $p<0.005$ ).

**Conclusions:** There is a higher rate of complications with concurrent procedures in the MBSAQIP database. Length of stay and operative times are increased in concurrent operations.

## **A185**

### **Effectiveness of bariatric surgery in end-stage renal disease requiring dialysis to increase renal transplant eligibility**

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Houston Methodist Hospital<sup>1</sup>

#### **Introduction:**

Morbid obesity can increase risk of complications after renal transplantation. There is a paucity of literature on bariatric surgery outcomes in renal transplant candidates. The primary objective was to study effectiveness of bariatric surgery as a weight reduction strategy in end stage renal disease (ESRD) patients to qualify for renal transplantation.

#### **Methods:**

We performed a retrospective analysis of a prospectively collected Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database at a single institution for patients with ESRD on hemodialysis who underwent bariatric surgery between 2011 and 2018. Patient characteristics and bariatric outcomes were analyzed.

#### **Results:**

Of 2,363 patients underwent bariatric surgery, 38 (1.6%) had ESRD on hemodialysis; mean age was 49.8 years, 52.6% were female, and mean BMI was 44.2. Twenty-four patients underwent laparoscopic Roux-en-Y gastric bypass (LRYGB) and 14 patients underwent laparoscopic sleeve gastrectomy. After 6 months, 17 patients (46%, n=37 had a BMI $\leq$ 35, while 25 patients



(75.8%,n=33) achieved BMI $\leq$ 35 at 12 months. There was no statistically significant difference in patients who reached BMI $\leq$ 35 at 12 months between sleeve and LRYGB procedures,  $P=0.58$ . Median length of stay (LOS) was 2.3 days. 30-day readmission rate was 5.3% (2 patients), and 2 patients (5.3%) required reoperation (one for bleeding, one for acute recurrent hiatal hernia). Also, 2 patients (5.3%) required transfusions peri-operatively. No mortality occurred.

**Conclusion:**

Laparoscopic bariatric surgery offers effective weight loss for patients with ESRD who desire transplant eligibility and can be achieved with acceptable outcomes in a high-risk population.

**A186**

**Comparative knee outcomes in patients with severe obesity following Total Knee Arthroplasty (TKA) and surgical weight loss. Preliminary results from the SWIFT Trial.**

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Geisinger Obesity Institute<sup>1</sup> University of Virginia<sup>2</sup> Louisiana State University<sup>3</sup> New York University Medical center<sup>4</sup> Yle University<sup>5</sup> New Your University Medical Center<sup>6</sup> Geisinger Medical Center<sup>7</sup>

**Introduction:** The SWIFT trial, is a multi-site, prospective trial comparing knee physical function outcomes in patients with severe obesity who undergo bariatric surgery prior to TKA versus TKA only. This preliminary report compares knee outcomes in patients that completed bariatric surgery only vs. patients that had TKA without bariatric surgery.

**Methods:** Knee outcomes for this analysis included Visual Analog Scale for knee pain, Timed Up and Go, 30-second Chair Stand, and 40-meter fast paced walk. The percent with >10% improvement in knee outcomes were compared between groups using logistic regression (adjusting for age and baseline BMI).

**Results:** This report includes 17 TKA eligible patients that completed 6-month follow-up after bariatric surgery and another 17 patients that completed 6-month follow-up after TKA only. The groups had a similar sex distribution (18% males in the bariatric group and 12% in TKA group,  $p=0.999$ ) but the bariatric group was younger (53 vs 60,  $p=0.0056$ ) and had a higher baseline BMI (47.1 vs 40.7,  $p=0.0020$ ). Although the percent with >10% improvement was consistently higher in the TKA group, these differences were not significant for Visual Analog Pain Scale (48% vs 41%,  $p=0.762$ ), Timed Up and Go (65% vs 59%,  $p=0.750$ ), 30-second Chair Stand (77% vs 41%,  $p=0.091$ ), or the 40-meter fast paced walk (76% vs 44%,  $p=0.147$ ).

**Conclusion:** Bariatric surgery results in modest improvements in knee outcomes in patients that are eligible for TKA and demonstrates potential to diminish the short term needs for knee replacement.

**A187**

**Correlation between Reduction of Renal Sinus Fat and Improvement of Blood Pressure after Bariatric Surgery.**

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**INTRODUCTION**

Renal sinus fat (RSF) may mediate obesity-related vascular disease. It is hypothesized to impair renal function through compression of renal structures, the release of locally acting molecules, or lipotoxicity, potential mechanisms by which obesity could promote hypertension and kidney diseases.

**METHODS**

We retrospectively reviewed all patients that underwent bariatric surgery between 2011 and 2018 in our institution. In patients with obesity, we measured the RSF via abdominal CT at procedure and at 18 months average follow-up. Data collected included baseline demographics, perioperative labs and renal basic profile.

**RESULTS**

A total of 30 patients met the criteria for inclusion. The average age was  $50.19 \pm 13.49$  years. The initial BMI was  $39.11 \pm 6.51$  kg/m<sup>2</sup> and the post-operative BMI was  $31.66 \pm 5.52$  kg/m<sup>2</sup> ( $p < 0.001$ ). Preoperative RSF volume was  $2.67 \pm 1.74$  cm<sup>3</sup> and post-Operative RSF volume was  $1.29 \pm 1.02$  cm<sup>3</sup> ( $p < 0.001$ ). The Systolic Blood Pressure pre-operatively was  $137 \pm 14.39$  mmHg and post-operatively it decreased to  $117.4 \pm 16$  mmHg ( $p < 0.001$ ), a statistically significant positive correlation between the RSF reduction and the Systolic Blood Pressure decrease ( $p < 0.037$ ) was found. We also found a negative correlation between RSF volume and GFR ( $p < 0.036$ ).

**CONCLUSION**

Bariatric surgery has demonstrated to be an effective treatment for severe obesity that results in remission of comorbidities including arterial hypertension. Our results suggest that at 18 months average follow-up we achieve a statistically significant reduction in Systolic Blood Pressure possibly via reduction in RSF. Further prospective studies may be needed to confirm these findings.

**A188**

## **Risk Factors and Rates of Cholecystectomy During Readmission Following Bariatric Surgery**

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University of Miami<sup>1</sup> University of Miami / JFK Medical Center<sup>2</sup>

**BACKGROUND:** With increased numbers of bariatric surgery procedures being performed, quality metrics such as readmission are of significant interest. Previous studies have been limited to individual hospitals. We sought to assess the rates of cholecystectomy during readmission after bariatric surgery across hospitals and to identify comorbidities and risk factors for such.

**METHODS:** The Nationwide Readmission Database from 2010-2015 was queried for patients who had previously had bariatric surgery who underwent a cholecystectomy during readmission. Multivariate logistic regression was used to determine the odds ratios (OR) for the outcomes of interest.

**RESULTS:** There were 886,596 patients who had bariatric surgery. Of which, 5,390 (0.06%) had a cholecystectomy performed during readmission. There were 1,240 patients (23.0%) who had a cholecystectomy during readmission at a different hospital. The majority of patients readmitted who underwent a cholecystectomy were female (84.5%) and had private insurance (57.9%).

The comorbidities associated with the highest ORs for cholecystectomy during readmission were chronic anemia(OR 2.11, p=0.007), diabetes with chronic complications(OR 1.86, p<0.001), and coagulopathy(OR 1.82, p<0.001).

Patients age  $\geq 65$ (OR 0.42, p<0.001), sleeve gastrectomy patients(OR 0.72, p<0.001), and patients with a CCI  $\geq 2$ (OR 0.83, p=0.002) were less likely to have a cholecystectomy during readmission.

**CONCLUSIONS:** Only a small number of bariatric surgery patients will undergo a cholecystectomy in their readmission period even when accounting for readmissions across other hospitals. This study elucidates those patients at higher risk for needing a cholecystectomy, but confirms that prophylactic cholecystectomy during bariatric surgery would not provide significant benefits in regards to improving resource utilization.

## **A189**

### **Can metabolic surgery be used as a primary prevention approach for kidney disease in the severely obese patient?**

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Cleveland Clinic Florida<sup>1</sup>

## INTRODUCTION

Hyperfiltration is the earliest marker leading to kidney disease. In previous studies we demonstrated the positive effects of bariatric surgery in chronic kidney disease (CKD). The aim of our current study is to assess the prevalence and improvement in hyperfiltration after bariatric surgery.

## METHODS

We conducted a retrospective chart review of our concurrent collected database on all patients who underwent bariatric surgery at our institution in the last 10 years. Kidney function was assessed using the estimated glomerular filtration rate (eGFR mL/min/1.73 m<sup>2</sup>). Mild and moderate-to-severe hyperfiltration was defined as eGFR 120-130 and >130 respectively. Urinary albumin-to-creatinine ratio (uACR) was measured to assess the presence of structural kidney injury.

## RESULTS

We were able to calculate eGFR in 2,611 patients. Eighteen percent of them (n=470) had signs of hyperfiltration. Twenty two percent of these patients (n=104) had the necessary measurement for comparison at 12 months follow-up from which 87.75% (n=91) had pre-operative uACR measurements (9.83±13.63). The average eGFR demonstrating a decrease of 8.54 mL/min/1.73 m<sup>2</sup> at 12-months (p=0.0001). Moderate and Severe Stages of hyperfiltration also demonstrated a significant improvement, 12.29 mL/min/1.73 m<sup>2</sup> at 12-months (p=0.0001).

## CONCLUSIONS

Bariatric surgery improves kidney function by decreasing hyperfiltration in patients without markers of structural kidney damage. These findings suggest that rapid weight loss after bariatric surgery could prevent kidney injury. This effect might be dictated by the regression in the earliest marker leading to CKD. These findings warrant future consideration for bariatric surgery as a viable option for primary prevention of CKD in the severely obese patient.

## A190

### **Smoking is a Risk Factor for Adverse Perioperative Outcomes for both Gastric Bypass and Sleeve Gastrectomy**

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University of Miami<sup>1</sup>

#### Objective:

Smoking status is a modifiable patient risk factor and smoking cessation is associated with improved outcomes in surgical patients. This study investigates the effect of smoking on perioperative outcomes and mortality for laparoscopic sleeve gastrectomy (LSG) and gastric bypass (LGBP) patients.

#### Methods:

MBSAQIP 2016 was the data source. Patients who underwent LSG and LGBP were identified. After correcting for confounders, the effect of smoking status on events (clavien-dindo >2),

readmission, and mortality were analyzed by logistic regression and Linear regression models for hospital stay. The analyses were reperformed separately for LSG and LGBP to identify the effect on each surgical technique and adverse event (ICU admission, pneumonia, PE, deep vein thrombosis, leak, sepsis, MI) by regression models.

#### Results:

147,151 patients were identified. 79.5% were female, 73.2%(107,726) underwent LSG. Overall claviendindo>2 complication rate was 1.5%(2,164). The overall cohort smoking was associated with increased odds of complications(OR 1.265, p=0.001). The results were similar for LSG(OR 1.250, p=0.019) and LGBP(OR 1.327, p=0.01). Although smoking was not a risk factor for mortality for the entire cohort (p=0.191), there was significantly higher odds of mortality for LSG(OR 1.554, p=0.023, 95%CI 1.110-2.120), however this was not seen in the LGBP(p=0.553). The effects were also significant for leaks(OR 2.683, P=0.004), ventilator>48hrs(OR 2.008, p=0.016), pneumonia(OR 1.707, p=0.002), transfusion(OR 1.255, p=0.047), unplanned intubation (OR 1.846, p=0.002), ICU admission(OR 1.350, p=0.005), and ER visit(OR 1.121, p=0.002).

#### Conclusion:

Smoking is a modifiable risk factor for severe adverse events and mortality. Smoking cessation may minimize the risk of adverse outcomes.

## A191

### Insurance Coverage Criteria for Bariatric Surgery

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**Background:** Bariatric surgery remains underutilized at a national scale and insurance company reimbursement is an important determinant of access to these procedures. We examined the current state of coverage criteria for bariatric surgery set by private insurance companies.

**Methods:** We surveyed medical policies of the 64 highest-market-share health insurance providers in the US. ASMBS guidelines and the CMS criteria for pre-bariatric evaluation were used to collect private insurer coverage criteria, which included procedures covered, age, BMI, co-morbidities, medical weight management program, psychosocial evaluation and a center of excellence designation. We derive a comprehensive checklist for pre-bariatric patient evaluation.

**Results:** Sixty-one companies (95%) had defined pre-authorization policies. All policies covered the RYGB, and 57 (93%) covered the LAGB or the SG. Procedures had coverage limited to Centers of Excellence in 43% of policies (n=26). 92% required a BMI of 40 or above, or of 35 or above with a co-morbidity, however, 43% (n=23) of policies covering adolescents (n=36) had a higher BMI requirement, of 40 or above with a co-morbidity. Additional evaluation was required in the majority of policies (MWM 87%, psychosocial evaluation 75%). Revision procedures performed for correction of surgical complications were covered in 79% (n=48) of policies, while second bariatric procedure for failure of weight loss were covered in 67% (n=41).

**Conclusions:** A majority of private insurers still require a supervised medical weight

management program prior to approval, and most will not cover adolescent bariatric surgery unless certain criteria, which are not supported by current evidence, are met.

## A192

### **Destination Care for Bariatric Surgery Can Be Feasible, Safe and Cost Effective: Proceed with Caution**

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Geisinger Medical Center<sup>1</sup>

**Background:** Increasingly, businesses are utilizing “destination care” (DC) to manage employee health care costs and assure quality. Providing bariatric surgical care in centers remote from the patient’s home raises serious concerns. Our study evaluated the outcomes and weight loss of patients traveling for an initial bariatric procedure as part of a workplace health care benefit.

**Setting:** Single center, tertiary referral, MBSQIP-accredited bariatric surgery center

**Methods:** A review of a prospectively maintained database was conducted of all DC patients from Dec 2016 through July 2018. 30-day outcomes were compared to non-DC patient in the same time-period and 6-month total body weight loss (TBWL) was calculated.

**Results:** A total of 63 DC patients had bariatric surgery (LSG n=23; RYGB n=40). Of the first 175 referrals, 38% travelled for an evaluation and 11% underwent surgery. The DC patients were higher acuity (age, male, BMI, comorbidity) and more likely to undergo LSG. They travelled from 20 states, primarily in the mid-Atlantic and southeastern United States. Their 6-month TBWL was 27.6% (LRYGB) and 23.3% (LSG). There was no difference in any 30-day clinical outcome with no mortalities. Nine months after surgery, the per member per month medical cost decreased 54% and pharmaceutical costs decreased 73%.

**Conclusions:** Providers have legitimate concerns about corporate-sponsored destination care. Our study demonstrates that a national DC program can be both safe and effective and associated with significant provider cost savings. However, success requires a significant FTE investment and a highly coordinated work effort between providers, patients and payer.

## A193

### **Bariatric Surgery Cost Sharing over a 10-year Period**

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Johnson & Johnson Medical Devices<sup>1</sup> Ethicon<sup>2</sup> Obesity Action Coalition (OAC)<sup>3</sup>

#### **Background:**

Only 1% of surgically-eligible patients with morbid obesity receive surgical treatment. Financial burden including out-of-pocket (OOP) costs may be a barrier to pursuing surgery. The objective of this study was to evaluate changes in OOP expenses among patients undergoing bariatric surgery.

**Methods:**

A retrospective cohort analysis of patients undergoing bariatric surgery in the IBM MarketScan® Commercial database who underwent bariatric surgery between 2008 and 2017. All patients were enrolled continuously throughout the year of their surgery. Outcomes assessed included number of bariatric procedures (projected to US commercial population), OOP expenses (copays, deductible, and coinsurance) at time of procedure, and average yearly total deductible. These results were stratified by plan type, procedure type, year, and provider network status(in/out).

**Results:**

A total of 170,914 patients were identified, projected to a population of 1,077,008. The majority were female (77%), and laparoscopic Roux-en-Y procedure accounted for the plurality of surgeries (44%). The most common healthcare plan type was PPO (60%) followed by HMO (13%). Most surgeries were performed by in-network providers (70%). The mean(SD) OOP expense (\$US 2017) at the time of procedure increased from \$1,206(\$2,310) in 2008 to \$1,392(\$2,072) in 2017. Mean(SD) yearly total deductible payments also increased during this time, from \$127(\$368) to \$196(\$560) respectively. Patients enrolled in high-deductible health plans (n=5,392) had the highest cost-sharing burden.

**Conclusion:**

Patient financial burden have increased over the 10-year period. Reducing the OOP expense for bariatric surgery may improve patient utilization and could reduce existing inequalities in obesity and related health problems.

**A194****The Impact of Metabolic surgery on the risk of fatal cardiovascular events and heart age in early and late stages of Chronic Kidney disease.**

David Gutierrez Blanco *Weston FL*<sup>1</sup>, David Romero Funes *Weston FL*<sup>1</sup>, Camila Ortiz Gomez *Weston FL*<sup>1</sup>, Joel Frieder *Weston FL*<sup>1</sup>, Lisandro Montorfano *Weston FL*<sup>1</sup>, Emanuele Lo Menzo *Weston FL*<sup>1</sup>, Samuel Szomstein *North Miami Beach FL*<sup>1</sup>, Raul Rosenthal *Weston FL*<sup>1</sup>  
Cleveland Clinic Florida<sup>1</sup>

**INTRODUCTION**

Obesity and kidney disease are independent risk factors for cardiovascular disease; which is the number one cause of death in America. The aim of our study is to determine the impact of metabolic surgery on the risk of fatal cardiovascular events in severely obese patients at early and late stages of chronic kidney disease(CKD).

**METHODS**

We conducted a Retrospective chart review of our concurrent collected database on all patients who underwent bariatric surgery at our institution in the last 10-years. Kidney disease was classified using estimated glomerular filtration rate(eGFR). Cardiovascular risk and heart-age was measured using the 10-year-Framingham risk score. Relative risk reduction(RRR) was calculated using the Framingham risk score measurements.

**RESULTS**

Among 2,611 patients with eGFR calculation 11.37%(N=297) had the necessary variables to calculate the 10-year-cardiovascular risk at 12 months follow-up. We observed hyperfiltration in 13.13%(n=39) of patients. These patients demonstrated a RRR in the 10-year-cardiovascular risk of 30% and 50% at 3 and 12 months follow-up respectively. These findings were accompanied by a heart-age reduction of 6 and 9 years at 3 and 12-months follow-up respectively (p=0.0002 and 0.0001). Similarly in patients with CKD we observed a RRR in the 10-year-cardiovascular risk of 35% at 3 and 12-months (P=0.0001 and 0.0001). This reduction was accompanied by a 3 and 5 year decrease in heart-age at 3 and 12-months (p=0.04 and 0.0013).

## CONCLUSIONS

Bariatric surgery reduces both, the 10-year-risk of a fatal cardiovascular event and the heart age at 3 and 12-months follow-up in all, early and late stages of kidney disease

## A195

### **How many sleeve gastrectomies are done at non-accredited centers in Texas?**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Introduction:** The American College of Surgeons has created the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) to improve the safety of surgery and track outcomes of patients undergoing metabolic and bariatric surgery (MBS). The MBSAQIP captures all surgeries performed at accredited centers (AC), but not all MBS cases done in the United States. The state of Texas has a large administrative database that tracks nearly all surgeries performed in the state and we proposed using this to look at number of sleeve gastrectomies (SG) and whether they were performed at an AC or not.

**Methods:** The Texas Inpatient and Outpatient Public Use Data Files (PUDF) for the year 2017 was examined. We used the CPT and ICD-10 codes for SG, 43775 and 0DB64Z3. We compared the PUDF facility list to a list of MBSAQIP accredited centers in Texas.

**Results:** There were 4,549 SG performed in Texas in 2017 that were reported in the Outpatient PUDF. Of these, 80.8% of cases were performed at ACs. Of the 136 facilities performing SG, 58 were MBSAQIP accredited. In the Inpatient PUDF for 2017 there were 11,287 SG, of which 9,829 (87%) were performed at ACs. Of the 153 centers performing SG, 77 were MBSAQIP accredited. There was a higher percentage of adjustable band conversions to SG at non-accredited centers in the Outpatient PUDF than the Inpatient PUDF.

**Conclusion:** The MBSAQIP database is missing almost 20% of outpatient SG performed in Texas and 13% of inpatient SG.



## **A196**

### **Malabsorbtion Surgery can be Safely Performed in an Ambulatory Surgical Setting**

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Bariatric Medical Institute<sup>1</sup> Bariatric Medicine Institue<sup>2</sup> Rex Bariatric Specialist<sup>3</sup>

#### Introduction

The Single Anastomosis Duodenal Ileostomy with Sleeve Gastrectomy (SADI-S) is gaining popularity in the United States as an alternative to the Gastric Bypass for patients with a high BMI or who are less likely to succeed with a sleeve. While SADI-S has similar weight loss to the GBP the complication rate is significantly lower allowing surgeons to perform SIPS in an ambulatory surgical center with 23 hour stay.

#### Methods

All SADI-S procedures performed from august 2015 to march 2019 performed at two bariatric centers were included in this study. Patients were chosen for SADI-S in the ambulatory surgical center if they had no end organ damage, no evidence of severe sleep apnea and had BMI<55 if they were male and BMI <60 if female.

All data was gathered retrospectively from prospectively kept databases. Thirty-day complication rates were analyzed using the Clavien-Dindo scale to assess the safety of performing SIPS in an ambulatory surgical center.

#### Results

Eighty-two patients were included in this study. The sample was 72% Female with an average age and BMI of 46 and 45 respectively. All patients are given IV fluids within three days following the procedure. Complication rates and severity grades are presented in Table 1. All patients with dehydration were treated only with IV fluids and were not chronically dehydrated following 30 days.

#### Conclusion

SADI-S can be done in an ambulatory surgical setting with 23 hour stay if appropriate patients are chosen and ERAS protocols are followed.

## **A197**

### **SADI-S a surgery safe enough for same day discharge**

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PanHandle Weight Loss Center<sup>1</sup> Bariatric Medical Institute<sup>2</sup> Bariatric Medicine Institue<sup>3</sup>  
Bariatric Medicine Institute<sup>4</sup>

#### Introduction

With the increasing popularity of the Single Anastomosis Duodenal Ileostomy with Sleeve

Gastrectomy (SADI-S) surgeons are finding that the SADI-S procedure when combined with ERAS protocols have very little post-operative pain or nausea. Herein we report our initial experience with same day discharge from an ambulatory surgical center.

#### Methods

All SADI-S procedure were performed in a single ambulatory surgical center by two separate surgeons. Surgical data including surgical time, blood loss and demographic data was gathered for all patients. Each of these patients had follow up in the office on POD #1 for IVF hydration and evaluation.

#### Results

There were 25 patients included in this study. The average operating time was 65 minutes with an average blood loss of 25cc. Patients were kept for a mean of 184 minutes following surgery prior to discharge. There were no major complications for any of these patients during the first 30 postoperative days and all were discharged the same day from the ambulatory surgical center. There were no hospital readmissions or ER visits.

#### Conclusion

This is the initial report of SADI-S performed in an ambulatory surgical center as an outpatient procedure. SADI-S when combined with ERAS protocols seems to be safe with same day discharge.

## A198

### **Risk of Stillbirth & Neonatal Death After Gastric Bypass: Nationwide Matched Cohort Study**

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**BACKGROUND** In a small study (N Engl J Med 2015; n=596) we have previously reported a potential signal of a more than doubled risk of stillbirth and neonatal death after maternal gastric bypass (P=0.06). We aimed to re-assess this risk in a larger sample.

**METHODS** We identified 5110 singleton births after gastric bypass and 28,379 matched controls in Sweden between 2007 and 2016. Controls were matched by maternal age, parity, pre-surgery BMI and diabetes status (early-pregnancy BMI and diabetes were used for controls), smoking, country of birth, and delivery year. Stillbirth and neonatal death were retrieved from the Swedish Medical Birth Register.

**RESULTS** Before surgery, the mean BMI was 43.1 (SD 5.3) and 9.6% had diabetes. The median surgery-to-conception-interval was 2.6 years (IQR 1.6-4.0), and the mean weight loss between surgery and early-pregnancy was 39kg (SD 13). The risk of stillbirth after gastric bypass was 0.5% [27/5110] versus 0.5% in matched controls (adjusted risk ratio [aRR] 1.02, 95%CI 0.62-1.68; P=0.95). The corresponding risks for neonatal death were 0.3% [16/5083] vs 0.2% (aRR 1.39, 95%CI 0.66-2.93; P=0.39) and for the combined outcome stillbirth plus neonatal death 0.8% [43/5110] vs 0.7% (aRR 1.13, 95%CI 0.75-1.71; P=0.55).

**CONCLUSIONS** Maternal gastric bypass was not associated with a higher risk of stillbirth or neonatal death compared to women matched on age, BMI, diabetes, smoking, parity and country of birth.

#### **A199**

##### **Retrospective Analysis of Laparoscopic Single Anastomosis Duodenal Switch (LOOP DS) at 6 Months and 1 Year**

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**Background** Data on Laparoscopic Single Anastomosis Duodenal Switch (LOOP DS) in the literature is limited compared to sleeve gastrectomy and gastric bypass.

**Purpose** Analyze the 6 month and 1 year data outcomes of patients who underwent LOOP DS as primary procedure.

**Method** Retrospective analysis of data from patients who underwent a primary LOOP DS performed by two surgeons at a 73 bed community hospital from March 2017 to April 2018.

**Results** 59 patients were identified for inclusion within the database. The Mean BMI at baseline was 52.2. The highest BMI was 67 and the lowest BMI was 41. 30 day and 1 year mortality rate was 0%. 30 day readmission rate was 5%. 30 day reoperation rate was 3.3%. 6 month mean excess weight loss was 61%. 6 month resolution of diabetes was 60%. 1 year mean excess weight loss was 81%. 1 year resolution of diabetes was 80%. At 1 year, participants had an average change in BMI of 23. The follow-up rate at 1 year was 75%. 6.7% required significant intervention such as total parental nutrition (TPN) or feeding tube placement due to malabsorption and vitamin deficiencies experienced within the first year.

**Conclusion** The LOOP DS procedure demonstrates successful weight loss and diabetes resolution as an alternative to sleeve gastrectomy and gastric bypass. More vitamin deficiency is noted with LOOP DS. The follow-up rate after LOOP DS is significantly higher than follow-up with other procedures.

#### **A200**

##### **Does ERAS impact outcomes of laparoscopic sleeve gastrectomy in adolescents?**

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Emory University School of Medicine Children's Healthcare of Atlanta<sup>1</sup>

**Background:** The aim of this study is to determine if implementation of an ERAS protocol can improve outcomes of laparoscopic sleeve gastrectomy (LSG) in adolescents.

**Methods:** A retrospective analysis of 100 adolescent patients who underwent LSG from February 2011 to April 2019 was conducted. An ERAS protocol was instituted in 2016. Conventional

care patients (n=51) were compared with ERAS patients (n=49). Patient demographic and clinical characteristics were reported as median for continuous variables, or counts and percentages for categorical variables. Comparisons were made using Chi-squared tests or Fisher's exact for categorical data and Wilcoxon-rank sum tests for continuous data. Multiple linear regression was used to adjust LOS (days) for age at surgery, gender, payer status, race/ethnicity, ASA, and pre-op BMI. LOS was log-transformed for normality.

**Results:** There were no significant differences in patient characteristics. Intraoperative fluid volume, intra- and post-operative narcotics were lower in the ERAS group ( $p<0.0001$ ). The number of ERAS elements per patient increased from 9 to 15 ( $p<0.0001$ ). The ERAS group had more discharges at post-operative day 1 (45% vs 6 %, respectively). LOS was significantly lower in the ERAS group (2.34 vs. 2.06 days, respectively). Differences were significant ( $p<0.0001$ ) after adjusting for age, gender, pre-op BMI, ASA, race/ethnicity. There were no differences in post-operative complications and 30 day readmissions.

**Conclusion:** A LSG ERAS protocol is associated with a significant reduction in perioperative narcotic use and LOS with no increase in complications or readmission rates.

## A201

### **Postoperative Sepsis after Primary Bariatric Surgery: an Analysis of MBSAQIP**

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University of Oklahoma - Tulsa<sup>1</sup> Atrium Health<sup>2</sup>

**Introduction:** Identifying patients at higher risk of postoperative sepsis(PS) may help to prevent this life-threatening complication. This study is aimed to identify predictors of PS after primary bariatric surgery and its associated factors.

**Methods:** An analysis of Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program(MBSAQIP) 2015-2017 was performed. Patients undergoing elective sleeve gastrectomy and Roux-en-Y gastric bypass(RYGB) were included. Exclusion criteria were revisions/conversions, endoscopic, and uncommon or investigational procedures. Patients were stratified by presence of absence of organ/space surgical site infection(OS-SSI), and patients who developed sepsis were compared to patients who did not develop sepsis in each cohort . Logistic regression was used to identify independent predictors of PS.

**Results:** 438,752 patients were included(79.4% female, age  $44\pm 12$  years). 661 patients(0.2%) developed PS of which 245(37.1%) developed septic shock. Out of 892 OS-SSI, 298(45.1%) developed sepsis( $P<0.001$  ). Patients who developed PS had a higher mortality, and this was highest in patients without OS-SSI . The main complications associated with PS in patients without OS-SSI were pneumonia and urinary tract infection(Table). Independent predictors of PS in OS-SSI included RYGB(OR: 1.67, 95%CI: 1.23-2.24), Age $\geq 50$  years(OR:1.36, 95%CI: 1.02-1.83), and black race(OR:1.51, 95%CI:1.01-2.25).

**Conclusion:** Development of OS-SSI after primary bariatric surgery is associated with sepsis and increased 30-day mortality. Patients without OS-SSI who develop PS have more than two times the mortality rate of patients with OS-SSI who develop PS. Early identification and intervention in patients with PS and no OS-SSI may improve survival in this high risk group.

## A202

### **Multicenter Experience with the Procedureless Gastric Balloon in Adolescents with Obesity**

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**Background:** The prevalence of obesity in adolescents has rapidly increased over the last decade and is associated with major short- and long-term health consequences. Lifestyle intervention alone is often ineffective and invasive surgery in adolescents is rarely undertaken due to risk/benefit perceptions. Recently, endoscopic treatment of obesity with an intragastric balloon (IGB) has emerged as a therapeutic option for adolescents.

**Objective:** To assess the safety and effectiveness of the Elipse™ Balloon, a swallowed and naturally-excreted IGB, in the management of adolescents with obesity.

**Methods:** The Elipse Balloon was swallowed and filled with 550ml of liquid during an outpatient visit. Nutritional follow up was performed over the 16-week device residence time. Data were collected on weight-loss (WL)(kg), BMI Loss (BMIL)(kg/m<sup>2</sup>), percentage total body weight loss (%TBWL), percentage excess weight-loss (%EWL) and complications.

**Results:** Retrospective review of records from 6 international obesity centers from August 2016 to January 2018 identified 50 adolescents aged between 15 and 19 years who had undergone Elipse™ Balloon treatments. All patients swallowed the capsule with 50% needing stylet assistance. At placement, mean weight was 99.2±24 kg and mean BMI 36.0±6.6 kg/m<sup>2</sup>. After 4 months, %TBWL was 13.0±5.4%. Mean WL, mean %EWL and mean BMI reduction were 13.2±6.5 kg, 50.1±27.8% and 4.8±2.3 kg/m<sup>2</sup> respectively.

3(6%) patients required endoscopic removal for intolerance. There were no serious complications.

**Conclusion:** Elipse™ appears to be safe and effective for the treatment of obesity in adolescents. It may be considered as a therapeutic option for this difficult to manage category of patients.

## A203

### **Surgeon and hospital volume outcomes in bariatric surgery: a population-based study**

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McGill University<sup>1</sup>

**Background:** Outcomes of bariatric surgery are tied to surgical volume. However, this relationship is not clearly established for each procedure including the most performed sleeve gastrectomy (SG).

**Methods:** All patients who underwent Roux-en-Y gastric bypass (RYGB) and SG in the province of Quebec, Canada during 2007-2012 were identified from administrative datasets. By procedure, multilevel cross-classified logistic regressions were used to test the effects of annual surgeon-volume (SV) and hospital-volume (HV) on a composite 90-day postoperative outcome. Receiver-operator-curve (ROC) curve was used to identify volume thresholds.

**Results:** 2,623 procedures were performed by 42 surgeons in 18 institutions. 821 underwent RYGB and 1,802 had SG. For RYGB, doubling the SV was associated with odds ratio (OR) of 0.80(95%CI:0.71-0.90). Doubling the HV was associated with OR of 0.74(95%CI:0.65-0.84) when adjusting for patient and surgeon-level parameters. Annual SV of 21 RYGBs and HV of 25 cases were identified (AUC=0.60 and 0.61, respectively). For SV, being in the higher category translated into an absolute risk reduction (ARR) of 12.5%. For SG group, doubling the SV and HV was associated with OR for complications of 0.93(95%CI:0.86-1.02) and 0.94(95%CI:0.87-1.01), respectively. Thresholds for SV of 17 and HV of 139 cases were identified (AUC=0.52 and 0.53, respectively).

**Conclusion:** SV and HV are significant independent predictors of 90-day composite morbidity after RYGB procedures. However, both relationships to outcomes are weaker after SG. This study further supports establishment of SV and HV requirements for RYGB. However, the role of such volume targets in SG remains unclear and needs further evaluation.

## A204

### **Pediatric Metabolic and Bariatric Surgery – Impact of Adult Surgeon Volume on Postoperative Outcomes**

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#### **Introduction**

In the field of adult metabolic and bariatric surgery (MBS), surgical volume is a known surrogate for quality. However, for adult metabolic and bariatric surgeons who also practice in the pediatric population, it is unclear whether adult MBS experience can be used to predict quality in these younger patients.

#### **Methods**

The New York (NY) Statewide Planning and Research Collaborative System was used to extract patients  $\leq 19$  years old undergoing a Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) or Sleeve Gastrectomy (SG) from 2010-2016. Surgeon adult MBS volume was categorized as low ( $\leq 50$ ), medium (50-150), or high ( $> 150$  cases/year). Multivariable analysis adjusting for patient age, sex, race, insurance, obesity-related comorbidities\*, calendar year, hospital volume, and clustered at the hospital level, was performed to examine differences in length of stay (LOS), 30-

day complications, and readmissions.

## Results

A total of 1,057 adolescents  $\leq 19$  years old underwent MBS from 2010-2016 in NY state, consisting of 796 (75.3%) SG and 261 (24.7%) LRYGB, performed by 154 surgeons. The mean LOS was 2.0 days, and the overall 30-day complication and readmission rates were 5.4% and 3.6% respectively. On multivariable analysis, medium and high-volume surgeons had 0.3- and 0.4-days shorter LOS when compared to low-volume surgeons ( $p < 0.001$  for both), without a corresponding difference in complications or readmissions (Table 1).

## Conclusion

Surgeons with high adult MBS volume have shorter LOS for their pediatric patients. These findings represent an important first step in developing clear quality metrics, particularly as the field of pediatric MBS evolves and expands.

## A205

### Unintended consequences for patients denied bariatric surgery: a 12-year follow-up

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Beth Israel Deaconess Medical Center<sup>1</sup>

Many patients who seek weight loss surgery are denied an operation due to insurance barriers, psychological concerns, failure to meet body mass index criteria, and poor medical fitness for surgery. The aim of this cohort study was to determine the natural history of patients denied eligibility for metabolic and bariatric surgery (MBS).

From January-December 2007, a multidisciplinary, accredited MBS program denied 105 patients surgery. Twelve years later a retrospective chart review and phone survey was conducted. Qualitative and quantitative analysis was performed using chi-square and t-test, respectively. Forty patients either declined participation or were lost to follow-up. Of the 64 remaining denied patients, 29 patients (45%) ultimately underwent MBS at a later date. These patients had long-term improvement in their hypertension ( $p < 0.05$ ), hyperlipidemia ( $p < 0.05$ ), diabetes ( $p < 0.05$ ), and pain ( $p < 0.05$ ). All 29 patients were alive at 12-year follow-up compared to the 35 patients who did not undergo MBS, of which 14 (40%) were deceased at 12-year follow-up ( $p < 0.05$ ). Interestingly, 13 of the remaining 21 living patients who did not undergo MBS are eligible today based on National Institutes of Health consensus criteria.

This study found that most patients who were initially turned away from MBS ultimately satisfied qualification criteria. Those who underwent MBS experienced long-term improvement in their co-morbid conditions and a survival advantage. However, denying patients who are seeking MBS is a death sentence for 40% of patients who, after initial denial, never underwent a metabolic operation.

## A206

### **A Propensity Matched Comparison of Gender Impact On Roux-en-Y Gastric Bypass in Outcomes: Redefining the Male Gender Risk**

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Geisinger Medical Center<sup>1</sup>

Background: Male gender has long been identified as a risk factor for adverse outcomes, including mortality, after RYGB. The objective of this study was to compare short-term outcomes of patients undergoing laparoscopic RYGB based on gender.

Methods: Patients undergoing RYGB in the 2015, 2016 and 2017 MBSAQIP database were propensity matched 1:1 to compare 30-day outcomes between males and females. A total 47,906 patients were included (23,953 Male/23,953 Female).

Results: The overall complication rate was higher in females (11.5% vs. 10.2%  $p < .001$ ) with no difference in mortality related to RYGB. No significant differences between gender were seen for organ space SSI or septic shock. Females had significantly more superficial SSIs ( $p = 0.002$ ), UTIs ( $p < 0.001$ ), readmissions ( $p < 0.001$ ) and reinterventions ( $p < 0.001$ ).

Males had significantly more episodes of unplanned intubation ( $p = 0.008$ ) and extended ventilator use ( $p = 0.01$ ), progressive renal insufficiency ( $p = 0.01$ ) and acute renal failure ( $p = 0.008$ ), cardiac arrest ( $p = 0.005$ ), ICU admission ( $p < 0.001$ ) and all-cause 30-day mortality ( $p = 0.038$ ).

Conclusions: Male gender has been identified as a risk factor for adverse events and mortality after RYGB in several risk models, including our own. This matched analysis demonstrates no specific increased mortality risk for males related to bariatric surgery, although the all-cause mortality risk for males is significantly higher. The prevalence of both major and minor complications was mixed between males and females while females had a higher overall complication rate after RYGB. The availability of the MBSAQIP PUF suggests it is time to create risk models for bariatric surgery.

## A207

### **Mid-Term Results of Revisional Bariatric Surgery post Sleeve Gastrectomy: Resleeve vs. Bypass**

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Al Amiri Hospital<sup>1</sup> Amiri Hospital<sup>2</sup>



## **Introduction**

Bariatric surgery has been shown to produce the most predictable weight loss results, with laparoscopic sleeve gastrectomy(LSG) being the most performed procedure as of 2014. However, inadequate weight-loss may present the need for a revisional procedure. The aim of this study is to compare the efficacy of laparoscopic re-sleeve gastrectomy(LRSG) and laparoscopic Roux-en-Y gastric bypass(LRYGB) in attaining successful weight loss following LSG.

## **Methods**

A retrospective analysis was performed on all patients who underwent LSG at Amiri Hospital from 2008-2018. A list was obtained of those who underwent revisional bariatric surgery after initial LSG, and their demographics were analyzed.

## **Results**

A total of 2,858 patients underwent LSG, of which 84 patients(3%) underwent either a revisional rLRYG or LSG. 82% of the patients were female. The mean weight and BMI prior to LSG for the LRSG and rLRYGB patients were 136.7Kg and 49.9Kg/m<sup>2</sup>, and 133.9Kg and 50.5Kg/m<sup>2</sup>, respectively. The mean BMI showed a drop from 42.03 to 31.7(p=0.000) 1-year post-revisional surgery for the LRSG group, and 42.7 to 34.5 (p=0.000) for the rLRYGB group, correlating to an excess weight loss(EWL) of 61.7% and 48.1% respectively. At 3 years post-revisional, LRSG patients showed a decrease in BMI to 30.71(EWL=61.4%), while those that underwent rLRYGB showed an increase to 35.3(EWL=40.3%)

## **Conclusion**

Revisional bariatric surgery is a safe and effective method for the management of failed primary LSG. LRSG patients tended to do better in the mid-term than those that underwent rLRYGB.

## **A208**

### **Metabolic and Bariatric Surgery in Prior Solid Organ Transplantation Patients: Is Race a Predictor of Adverse Outcomes?**

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Mayo Clinic<sup>1</sup> Temple University Hospital<sup>2</sup>

**Introduction:** Metabolic and Bariatric Surgery (MBS) is increasingly performed in patients with previous solid organ transplantation (PSOT). There also remains controversy about whether racial disparity in outcomes following MBS exists. Little is known about outcomes in MBS racial cohorts who have PSOT. Our aim was to determine if race independently predict outcomes in MBS patients with PSOT. **Methods:** We performed a retrospective analysis of the 2017 Metabolic and Bariatric Surgery Accreditation Quality and Improvement Project (MBSAQIP) database. We included Sleeve Gastrectomy (SG) and Roux-en-Y gastric bypass (RnYGB) patients. Selected cases were stratified by race, comparing non-Hispanic Black and non-Hispanic White patients. Outcomes were compared by Mann-U-Whitney, Chi-square Test and Multivariable Logistic Regression (MLR) analysis. **Results:** Of 614 MBS cases with PSOT in the 2017 MBSAQIP database, we analyzed 297, including 220 (74%) White and 77 (26%) Black patients. Procedure-type (p = 0.66) and surgical approach (p = 0.55) were similarly distributed. Black patients were more likely to have an ASA >3, hypertension, an IVC filter, be on chronic

steroid ( $p = 0.03$ ) and dialysis-dependent (Table 1). There were no significant differences in outcomes, except a 3-fold higher rate of ED visits in Black patients ( $p = 0.004$ ). Black patients had non-significantly higher rates of morbidity, 30-day adverse outcomes, VTE, and aggregate pulmonary and renal complications. **Conclusion:** MBS in racial cohorts with PSOT is safe, with very low rates of morbidity and mortality. Black race was not an independent predictor of outcomes. Larger cohort studies are needed to validate our findings.

## A209

### Long-Term Outcomes of Conversion of Failed Roux-en-Y Gastric Bypass to Duodenal Switch

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**Background** The long-term studies with ten-year follow-up data have shown a failure rate of 15-35% following Roux-en-Y gastric bypass (RYGB).

**Aim** The aim of the study was to evaluate the outcomes following laparoscopic duodenal switch (DS) surgery after failed RYGB.

**Setting** Single private institute, United States.

**Methods** Data from 69 patients who underwent a laparoscopic conversion of failed RYGB to either Roux-en-Y DS (RYDS) or single anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S) from January 2012 through March 2019 by two surgeons were retrospectively analyzed. Regression analyses were performed for all follow-up weight-loss data.

**Results** Sixty-nine patients were included in the study. Of the 69 patients, nine patients underwent RYDS, and 60 patients underwent SADI-S. The average time to reoperation and weight regain following RYGB were  $16.7 \pm 10.2$  years and  $83.1 \pm 49.3$  lbs. The most common indications for revision were weight loss failure and weight regain. The mean age and BMI before revision DS were  $50.5 \pm 10$  yrs. and  $44.6 \pm 9.5$  kg/m<sup>2</sup>, respectively. The average length of stay, blood loss and operating time were  $3.6 \pm 2.7$  days,  $39 \pm 3.9$  cc, and  $148 \pm 46.3$  mins, respectively. At five years, the patients lost an average BMI of  $8.2 \pm 7.4$  kg/m<sup>2</sup>. The %EWL and %TWL were  $52.6 \pm 38.3$  and  $17.3 \pm 16.8$ , respectively. The short- and long-term complication rates were 28.9% and 14.4%, respectively.

**Conclusion** A laparoscopic revision from RYGB to DS is an effective weight-loss operation with long-term follow-up of 5 years.

## A210

### 5 years following resleeve gastrectomy

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**INTRODUCTION:**Laparoscopic sleeve gastrectomy (LSG) became the most popular procedure in bariatric surgery. However, in the long-term follow-up, weight loss failure and intractable severe reflux after LSG can necessitate further interventions.

**OBJECTIVES:**The aim of our study was to evaluate long term results (5 years) following resleeve gastrectomy (ReSG) and to identify the good indication.

**METHODS:**Fifty two patients underwent ReSG between October2008-January2014. 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:**Fifty two patients (46 women;mean age-40.2 years) with a mean BMI of 39.4 Kg/m<sup>2</sup> underwent ReSG. One patient died from gynecological cancer. Of the remainder, 3 patient underwent SADI, 5 patients underwent a RYGB, 1 patient underwent a second ReSG for reflux. 39 out of 42 patients without reoperation had available data at 5 years-follow-up. The mean percentage of excess BMI loss was 63.7%. Of the 39 patients, 28 patients (71.8 % of patients) had >50% EBMI at 5 years. All cases were completed by laparoscopy with no intraoperative incidents.

**CONCLUSION:** 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.

## A211

### **30 day Outcomes Comparison Between Sleeve and Roux en Y Bypass in Solid Organ Transplant Recipients: Metabolic and Bariatric Surgery Accreditation and Quality Improvement Project (MBSAQIP) Analysis**

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University of Missouri<sup>1</sup>

**Introduction:** Morbidity and mortality rates continue to improve in bariatric surgery patients, and higher risk patients are now able to undergo weight loss surgery. Current literature is limited with regard to bariatric surgery in patients after solid organ transplant. Transplant recipients carry a higher morbidity and mortality compared to the remainder of the population. Our objective is to analyze the potential risk factors and postoperative complications in weight loss surgery patients after organ transplantation, comparing sleeve gastrectomy vs gastric bypass.

**Methods:** MBSAQIP patient use files for 2017 were queried for all patients who had previous solid organ transplant. Outcome variables and patient characteristics were compared between sleeve gastrectomy and gastric bypass using Student's t-test for continuous variables and Chi-square test and Fisher's exact test for categorical variables. Significance was considered at p<0.05.

**Results:** 383 transplant recipients who subsequently underwent a gastric bypass or sleeve gastrectomy were identified. Significantly different preoperative characteristics between sleeve gastrectomy and gastric bypass were sex, renal insufficiency, creatinine and chronic

steroid/immunosuppressant use (Table 1). 30 day readmission rate was the only significant postoperative complication different between sleeve gastrectomy (7%) and gastric bypass (17%) (Table 1).

**Conclusion:** Our findings, from the largest series to date, conclude that both gastric bypass and sleeve gastrectomy are safe, in the short-term, in patients after solid organ transplant. There is a low risk of morbidity and mortality in this higher risk population. Long-term complications in patients on chronic immunosuppressive agents are not evaluated in this study.

## A212

### **Predictors of Early Reintervention Following Intra-gastric Balloon: An MBSAQIP Analysis**

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Loyola Stritch School of Medicine<sup>1</sup> Loyola University Medical Center<sup>2</sup>

**Introduction:** Intra-gastric balloons (IGB) have emerged as a novel minimally invasive therapeutic modality for treatment of obesity, however, factors placing patients at risk for early reintervention are poorly understood.

**Methods:** The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was queried to identify patients who underwent IGB between 2016 and 2017. Cohorts were stratified by need for a post-IGB procedural reintervention within 30-days. Patient and procedural demographics were compared using Mann-Whitney and Pearson's  $\chi^2$  tests. Multivariable logistic regression (MVR) analysis was performed adjusting for patient characteristics associated with reintervention at  $p < 0.1$ .

**Results:** Of 2,910 IGB procedures identified, 125 (4.3%) patients required reintervention. On univariate analysis, patients requiring reintervention had increased median Body Mass Index (BMI) (36.8 vs 34.8;  $p < 0.001$ ) and were less likely to have had previous foregut surgery (PFS) (5.6% vs 20%,  $p < 0.001$ ). On MVR adjusting for age, race, BMI, gastroesophageal reflux, chronic obstructive pulmonary disease (COPD), hypertension, diabetes, chronic steroid use, and history of PFS, predictors of reintervention included: increased age (OR 1.02; 95% CI:[1.01-1.04]), chronic steroid use (OR 4.82; 95% CI:[2.03-11.47]), and history of COPD (OR 7.27; 95% CI:[1.77-29.81]). Increased BMI was not associated with risk of 30-day reintervention (OR 1.02; 95% CI:[0.99-1.04]).

**Conclusions:** Independent of patient BMI, risk factors for 30-day reintervention following IGB include increased age, chronic steroid use, and a history of COPD. Understanding patients at highest risk for reintervention may allow for improved patient selection and short-term outcomes for this novel treatment.

## A213

## **Recent Smoking History and Risk of Post-operative Complications Following Weight Loss Surgery: Analysis of Metabolic and Bariatric Surgery Accreditation and Quality Improvement Project (MBSAQIP)**

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University of Missouri - Columbia<sup>1</sup>

**Authors:** Thaqi M, MD. Jennings JB, MD. Ganga RR, MD. Wheeler AA, MD.

**Introduction:** A history of smoking may place patients who are undergoing bariatric surgery at increased risk of perioperative complications. Our goal is to understand what complications patients may develop who were smokers in the 12 months prior to bariatric evaluating both Roux en Y gastric bypass (RYGB) and vertical sleeve gastrectomy (VSG) patients.

**Methods:** MBSAQIP patient use files from the years 2015-2017, were analyzed to determine the prevalence of smoking in the prior 12 months to bariatric surgery. Patients were analyzed with regard to smoking status and procedure type. We examined preoperative characteristics and postoperative complications. Data analysis was performed with Chi-Square test and logistic regression was used to control for confounding variables. Statistical significance was considered at a  $p < 0.05$ .

**Results:** 555,239 patients had weight loss surgery. 47,768 patients (8.55%) were smokers. Smokers undergoing a RYGB and VSG were at an increased risk of post-operative dehydration, readmission, and re-operation within 30 days. Smokers undergoing (VSG) were also found to be at increased risk for organ space SSI, pneumonia, unplanned ICU admission and re-intervention within 30 days (Table 1).

**Conclusion:** Using MBSAQIP data, we demonstrated that patients who smoked in prior 12 months to weight loss surgery had increased rates of complications but the rates of complications are still quite low in these patients. Further studies are needed to evaluate longer-term complications.

### **A214**

#### **Role of Bariatric Surgery in Risk Reduction of Stroke using the CHA2DS2-VASc Score: A case-controlled study**

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Cleveland Clinic Florida<sup>1</sup>

#### **Background**

Stroke risk in Atrial fibrillation(AF) patients without anticoagulation is determined by the CHA2DS2-VASc-score. The aforementioned is the acronym for the major comorbidities that have an impact on developing a stroke. The aim of the study is to analyze the role of Bariatric surgery(BS) on the risk of stroke.

#### **Methods**

After IRB approval, we performed a retrospective analysis of all patients with BMI>35Kg/m<sup>2</sup>

from 2004 to 2019. Patients that had AF before BS(cases) and prior to Internal Medicine visit(controls) were included. Groups were matched by demographics and comorbidities. The CHA2DS2-VASc-score was calculated at first visit(for controls)or baseline and at 12-months. Patients on warfarin prior to BS and with valvular-AF were excluded.

### **Results**

From 4,226 bariatric patients, 2.1%(N=90) had AF. Of which 57.8%(N=52) male, 46.6%(N=42) had LSG with a baseline BMI $39.7\pm 6.4$ kg/m<sup>2</sup>. Controls were 61%(N=58)males and BMI of  $38.7\pm 5$ kg/m<sup>2</sup>. At follow-up, stroke improved significantly in relation to the controls; 21.1%vs.31.1%( $p<0.001$ )(Table1) with a relative risk reduction(RRR) of 71%. Baseline CHA2DS-VaSc2-score was not significant for stroke( $p=0.07$ ) or systemic embolism/TIA risk( $p=0.06$ )(Table2). The 12-months analysis revealed a reduction of 2-points of the score, in relation to the control(2.8 points vs. 4.8 points;  $p<0.001$ ). Similarly, 52% RRR for the predicted risk of stroke (3.3% vs. 6.9%;  $p<0.001$ ) and 53% of systemic embolism/TIA (4.5% vs. 9.7%;  $p<0.001$ )(Table3).

### **Conclusion**

Our results showed a risk reduction of developing a stroke in 1-year of 71% in bariatric patients in relation to non-bariatric, with over 50% reduction in the CHA2DS2-VASc-score predicted. Consequently, a reduction of a lethal complication of obesity.

## **A215**

### **Comparison of outpatient versus inpatient sleeve gastrectomy - a safety analysis**

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Texas Tech University Hospital<sup>1</sup>

**Background:** There has been a recent interest in performing primary sleeve gastrectomy (SG) in the outpatient setting to reduce cost. Information on the safety of outpatient SG is sparse.

**Objective:** The aim of this study was to assess the safety of outpatient SG.

**Methods:** Patients who underwent primary SG were identified in the 2015-2017 MBSAQIP database. Outpatient procedure was defined as having a hospital length of stay (LOS) of 0 days while inpatient procedure was defined as having a LOS from 1 do 3 days. The primary outcome was 30-day mortality. Secondary outcomes were 30-day readmission, 30-day reoperation, leak and bleed rates and 30-day morbidity. Propensity score matching was used.

**Results:** A total of 336,183 SG patients met the inclusion criteria. Of these, only 10, 814 (3.22 %) were outpatient procedures. Outpatients SG, as compared with inpatient SG, was associated with similar risk of death (0.09% vs 0.05%; relative risk [RR], 1.80; 95% confidence interval [CI], 0.60 to 5.37,  $P=0.285$ ), higher risks of readmission (3.68% vs 2.68%; RR, 1.37; 95% CI, 1.18 to 1.61,  $P<0.001$ ), reoperation (1.05% vs 0.64%; RR, 1.65; 95% CI, 1.21 to 2.25,  $P=0.001$ ), leakage (0.63% vs 0.37%; RR, 1.72; 95% CI, 1.14 to 2.60,  $P=0.008$ ), bleeding (0.59% vs 0.37%; RR, 1.61; 95% CI, 1.07 to 2.43,  $P=0.022$ ) and similar risk of morbidity (1.25% vs 1.27%; RR, 0.98; 95% CI, 0.78 to 1.26,  $P=0.898$ ).

**Conclusion:** Sleeve gastrectomy in outpatient setting was associated with higher risk of readmission, reoperation, leakage and bleeding as compared to inpatients.

## A216

### **Defining an international standard for primary and secondary non-response following bariatric surgery for research purposes: a modified Delphi consensus**

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Maxima Medical Center<sup>1</sup>

#### **Introduction**

Primary nonresponse(1NR)– inability to achieve adequate weight loss after surgery – and secondary nonresponse(2NR)– excessive weight regain after initial adequate weight loss – are major challenges in follow-up after bariatric surgery. Previous studies have shown an alarming lack of uniformity of these definitions in both literature and clinical practice

The aim of this project is to obtain consensus on the definition of 1NR and 2NR following bariatric surgery in order to allow reliable data comparison and transparency in the field of bariatric research.

#### **Methods**

The modified Delphi method was used to assess consensus in an expert panel on the definition of nonresponse. Bariatric experts were selected based on their expertise in high impact bariatric research or their influence in the bariatric field and were invited to participate. Two rounds of questionnaires were distributed to the panel. All questions were designed as ordinal questions, using a nine-point scale for experts to score whether they deemed it appropriate to include the statement. The cut-off in terms of consensus per item was set at 75%.

#### **Preliminary results**

Consensus was reached on 31/44 statements. 1NR is defined as less than 15% total body weight loss at 12 months. 2NR is defined as at least 20% regain of total weight loss measured at a minimum of two years after surgery.

#### **Conclusion**

Standardized definitions for 1NR and 2NR are vital to prevent misinterpretation of literature and to improve patient care. All researchers active in the bariatric field are therefore advised to consider using these consensus-based definitions

## A217

### **Mortality in patients with type 2 diabetes after bariatric surgery: a population-based matched cohort study**

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McMaster University<sup>1</sup>

**Background:**

There is excellent randomized data demonstrating the profound effect of bariatric surgery on diabetes but these studies are not powered to study mortality. Large, observational studies are needed to study mortality but often lack important clinical variables. Our objective, therefore, was to use multiple, linked administrative databases to characterize the association between bariatric surgery and mortality in diabetics.

**Methods**

We matched(1:1) patients from the Ontario Bariatric Registry based on age, gender, BMI, BMI measurement date and diabetes diagnosis date to patients from a provincial family medicine database. Secondary analyses adjusted based on patient socioeconomic status, comorbidities, smoking status, previous malignancy/cancer screening rates, healthcare utilization and psychiatric disease. Mortality was linked from provincial death records. Cox-proportional hazard models were used to assess the main outcome across strata.

**Results:** Overall, 6,446 patients (3,223 cases and controls) were included with a median follow-up time of 5.5 years. Mortality rates were 2.2% in the surgery group and 6.3% in the controls (HR 0.32, 95%CI 0.25-0.43,  $p<0.001$ ). This effect was consistent across all durations of diabetes. Males had an absolute risk reduction of 6.4% (9.1% vs 2.7%, HR 0.28, 95%CI 0.181-0.436,  $p<0.001$ ) while females also had substantial benefits. Diabetics aged 45-54 had an 80% reduction in mortality (HR 0.20, 95%CI 0.10-0.39). Effects across BMI strata and for both sleeve gastrectomies and gastric bypasses were consistently positive.

**Conclusion:**

In this a population-based matched cohort study, bariatric surgery demonstrated a consistent and profound effect on mortality across diabetic duration, BMI, age and gender.

**A218****Concurrent Hiatal Dissection Predicts Increased Reoperation and Readmission with Sleeve Gastrectomy vs. Gastric Bypass**

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University of Utah General Surgery<sup>1</sup> University of Utah<sup>2</sup>

**Background**

Although early postoperative complications of hiatal dissection and fundoplication are well described, risks of sleeve gastrectomy (SG) or gastric bypass (RYGB) combined with hiatal dissection (HD) have not been established.

**Objective**

To determine whether performing HD with RYGB or SG predicted increased risk of postoperative complications compared to RYGB or SG alone.



## Methods

Data from MBSAQIP database from January 2015-December 2016 was reviewed for presence or absence of HD performed with SG or RYGB. Univariate and multivariate logistic regression compared complication rates between groups. BMI and demographic data were adjusted for in all models.

## Results

78,889 RYGB and 199,786 SG were included. 12% of RYGB and 22% of SG were performed with HD. SG with HD was associated with 10% increased odds of 30-day reoperation (OR 1.10; 95% CI: 1.03, 1.17/  $p=0.003$ ) and 17% increased odds of 30-day reoperation (OR 1.17; 95% CI: 1.04, 1.31/  $p=0.01$ ) compared to SG without HD. HD did not increase odds of reoperation or readmission associated with RYGB. Adding HD to RYGB increased odds of anastomotic stricture by 63% (OR: 1.63, 95% CIT: 1.29, 2.06/  $p<0.001$ ).

## Conclusion

Although MBSAQIP does not track hiatal hernia type, aggregate data demonstrates concurrent HD predicts increased 30-day readmission and reoperation rates for SG and stricture rates for RYGB. Because concurrent HD predicts increased risk of serious complications in SG and strictures in RYGB, given its known beneficial reflux effects, RYGB without HD may be preferable in patients with small hiatal hernias with or without GERD symptoms.

## A219

### Positive Effects of Bariatric Surgery on Idiopathic Intracranial Hypertension

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Cleveland Clinic<sup>1</sup>

**Background:** Idiopathic intracranial hypertension (IIH), also known as pseudotumor cerebri, is associated with obesity. We aim to study the effect of bariatric surgery on IIH.

**Patients and Methods:** A retrospective review was conducted on all bariatric surgery patients with preoperative diagnosis of IIH. Patient demographics, type of surgery, and subjective and objective evaluation of IIH were recorded.

**Results:** A total of 59 patients with IIH were included. The median age and body mass index (BMI) were 39-years (Interquartile range[IQR]=29.5-47.5) and 49kg/m<sup>2</sup> (IQR=44.1-52.9), respectively, with a female predominance (n=58,98%). Roux-en-Y gastric bypass (RYGB) was the most common procedure (n=38, 64%) followed by sleeve gastrectomy (n=17, 29%), and adjustable gastric banding (n=4, 7%). There was a median decrease in BMI of 12.1kg/m<sup>2</sup>(IQR=7.2-15.2) over a median follow-up period of 25-months (IQR=13-53.5). In addition to symptomatic improvement, there was a significant decrease in the median number of prescription medication used [Topiramate (Topamax) and Acetazolamide (Diamox)],  $p<0.001$  (Table 1). Complete perioperative lumbar puncture data was available for 11/59(18.6%) patients

only. A decrease in opening pressure was noted in 8/11(72.7%) patients. Furthermore, headache and visual symptoms improved in 30/54 (55.6%) and 16/21 (76.2%), patients respectively.

**Conclusion:**This is the largest single center study showing that bariatric surgery is associated with subjective and objective improvement in IIH. This effect might be related to the decrease in weight noted with bariatric surgery. Further prospective studies are needed to better delineate the correlation between the specific type of procedure, changes in spinal pressure, and outcomes.

## A220

### **A comparison between short vs. long biliopancreatic limb gastric bypass: early outcomes of a prospective study.**

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The Obesity Clinic at Hospital General Tláhuac<sup>1</sup> The Obesity Clinic at Hospital General T<sup>2</sup>

#### **Background**

It has been well documented that gastric bypass achieves sustained long-term results with impact in comorbidities. Lengthening the biliopancreatic limb could improve results.

#### **Objectives**

To compare the effect on comorbidities and weight loss of a long biliopancreatic limb Roux-en-Y gastric bypass (L-RYGB), compared with a standard RYGB.

#### **Methods**

Prospective study including patients submitted to RYGB (n=94) and L-RYGB(n=94) at a single institution. Procedure selection was randomly assigned (1:1), surgeries were performed for 24 months (2016-2017). Weight loss, comorbidities control and nutritional status were assessed (baseline and 12 months).

#### **Results**

Baseline characteristics were homogenous between groups (Table 1). Mean percentage of excess weight loss after 12 months was 77.6% for RYGB versus 84.7% L-RYGB (p 0.02); mean percentage of total weight loss after 12 months was 47.3% versus 52.8%, respectively (p .20). Patients with T2DM at baseline (RYGB n=29, L-RYGB n=29), had a 12 months remission rate of 68.9% versus 65.5% (p 0.80), respectively. Hypertension improvement was 77.5% and 83.4% for RYGB and L-RYGB (p 0.78). Hypertriglyceridemia and HDL levels improvement was 40.7% versus 41.1% for RYGB and L-RYGB (p 0.27), and 25.7% versus 38.2% (p 0.72), respectively. Thirteen (13.8%) patients suffered a major complication, 8 (8.5%) versus 5 (5.3%) for RYGB and LBP-GB (p 0.53). Laboratory tests, perioperative analysis and complications are in Table 2 and 3.

#### **Conclusion**

There was significant difference on weight loss in the patients receiving long biliopancreatic limb Roux-en-Y gastric bypass. Both groups had similar effects on diabetes, hypertension,

dyslipidemia and metabolic syndrome remission.

## A221

### **Comparative analysis of robotic versus laparoscopic revisional bariatric surgery outcomes from the MBSAQIP database**

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Henry Ford Hospital<sup>1</sup> Medical College of Wisconsin<sup>2</sup>

**Background:** There is limited data evaluating the role of robotics in revisional bariatric surgery compared to laparoscopy. The purpose of this study was to compare outcomes of laparoscopic and robotic revisional bariatric surgery using the MBSAQIP database.

**Methods:** The 2015-2017 MBSAQIP database was queried for patients undergoing revisional robotic and laparoscopic sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB). Multivariate logistic regression was used to compare outcomes between robotic and laparoscopic approaches, adjusting for co-morbidities and operative time.

**Results:** A total of 17,022 patients underwent revisional SG with 15,938 (93.6%) laparoscopic and 1,084 (6.4%) robotic, and 12,451 patients underwent revisional RYGB with 11,213 (90.1%) laparoscopic and 1,238 (9.9%) robotic. There was no difference in overall morbidity between robotic and laparoscopic SG (4.52% vs. 3.22%; AOR 1.12;  $p=0.48$ ). However, there were higher organ space surgical site infections (SSIs), sepsis, and reinterventions with robotic SG. Robotic RYGB was associated with lower overall morbidity compared to laparoscopic (5.25% vs. 7.96%; AOR 0.62;  $p<0.01$ ) as well as lower respiratory complications, pneumonia, superficial SSIs, and postoperative bleeding. The robotic approach with both procedures was associated with longer operative time ( $p<0.01$ ). Length of stay was longer in the robotic group for SG ( $p<0.01$ ) but was not different for RYGB ( $p=0.87$ ).

**Conclusions:** Robotic revisional bariatric surgery has a similar overall complication profile compared to the laparoscopic approach for sleeve gastrectomy and decreased for Roux-en-Y gastric bypass. Further analysis is needed regarding variability in surgeon technique and operative experience to determine what factors contribute to these differences.

## A222

### **5 Year Follow-up of Previously Published Cohort Comparing Diabetes Surgery vs. Intensive Medical Weight Management on Diabetes Remission in Patients with Type 2 Diabetes and BMI 30-35; the Role of sRAGE Diabetes Marker as Potential Predictor of Success**

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NYU School of Medicine/Bellevue Hospital<sup>1</sup>

## **Introduction**

We previously conducted a randomized controlled trial comparing diabetes surgery to intensive medical weight management (MWM) to treat patients with type 2 diabetes (T2DM) and Body Mass Index (BMI) 30-35 kg/m<sup>2</sup>. At 3 year follow-up, we found that surgery was highly effective in T2DM remission and that the soluble form of RAGE (receptor for advanced glycation end-products) may be an adequate diabetes biomarker that may help determine which patient population would benefit most from surgery.

The purpose of this study is to provide longer-term (5-year) follow-up of this initial patient cohort.

## **Methods**

Retrospective chart review was performed of the initial patient cohort. Demographic data from the initial cohort included baseline weight, glycated hemoglobin (HbA1c) as well as medications. Repeated measures linear models were used to model weight loss and change in HbA1c.

## **Results**

Originally, 57 patients with T2DM and BMI 30-35 were randomized to surgery (bypass, sleeve or band based on patient preference; n=30) vs. MWM (n=27). At baseline, mean BMI was 32.6 kg/m<sup>2</sup> and mean HbA1c was 7.8. At 5 year follow-up, the surgery group continued to have lower HbA1c (6.58 vs. 7.99) and lower BMI (27 kg/m<sup>2</sup> vs. 29.9 kg/m<sup>2</sup>) vs. the non-surgical group. At 3 years, in the surgical group, those with a higher baseline sRAGE had a lower post-op BMI.

## **Conclusion**

Diabetes surgery in T2DM patients with BMI 30-35 kg/m<sup>2</sup> remains effective up to 5 years. Higher baseline sRAGE may predict success with surgery.

## **A223**

### **Implications of Bariatric Tourism from an Academic Center Approximating the US-Mexico Border— Getting what you pay for or paying for what you get?**

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University of California, San Diego<sup>1</sup> UC San Diego<sup>2</sup>

### **Objective:**

Evaluate patient outcomes/financial consequences of managing surgical complications following bariatric surgery abroad.

### **Introduction:**

Medical tourism is a recognized phenomenon where patients travel seeking healthcare. Bariatric tourism bypasses critical perioperative infrastructure specific to this patient population. We examine the care/cost required to manage catastrophe from bariatric tourism.

### **Materials and Methods:**

Retrospective review of a prospectively maintained database was performed identifying patients treated for complications of cross-border bariatric surgery. Outcomes include mortality, length of stay, readmissions, interventions, and cost compared to our bariatric patients.

### **Results:**

From 2011-2019, 22 patients presented with complications from bariatric surgery in Mexico: 19 LSG, 1 LSG to RYGB revision, 1 open SG, and 1 RYGB revision. Average age 42, 77% female, average BMI 39. Complications included leak (63.6%) and stricture (13.6%). Average LOS 22 days, 14 readmissions. Average 3.5 (0-20) interventions per patient performed included endoscopy, stent, Ovesco, botox, percutaneous drain, empyema decortication, laparotomy washout, and incisional hernia repair. Three patients required revision surgery. Mortality rate: 13.6% (3/22). Complication rates for bariatric surgery at UCSD: bleeding (1.6%), leak (0%), and mortality (0%). Cost averaged \$353,531 per tourism patient, often not covered by insurance. Uncomplicated bariatric surgery at UCSD averages \$24,000.

### **Conclusion:**

Complications from unregulated bariatric surgery are catastrophic due to unacceptable morbidity and mortality, generating dire financial burden to the patient and US healthcare system. Cheaper bariatric surgery in Mexico forfeits the benefit of early recognition and ownership of complications assumed by accredited U.S. bariatric centers. For the patients, and our system, the price is too high.

## **A224**

### **Elevated preoperative hemoglobin A1c is not associated with increased postoperative complications after laparoscopic Roux-en-Y gastric bypass**

Casey Lamb *Lebanon NH*<sup>1</sup>, Sarah Billmeier *Lebanon NH*<sup>1</sup>, Thadeus Trus *Lebanon NH*<sup>1</sup>  
Dartmouth-Hitchcock Medical Center<sup>1</sup>

**Background:** Poorly-controlled diabetes mellitus is associated with increased complications following general surgery procedures. Bariatric surgery results in rapid metabolic changes that improve glucose control. We examined the correlation between preoperative glycemic control and postoperative complications in patients undergoing bariatric surgery.

**Methods:** The 2017 MBSAQIP database was used to examine the association between preoperative hemoglobin A1c and 30-day postoperative complications. All patients undergoing laparoscopic Roux-en-Y gastric bypass (LRYGB) or sleeve gastrectomy (LSG) with a preoperative A1c were included. Multivariate logistic regression models stratified by procedure

type were used to adjust for known confounders including age, gender, preoperative surgery status, race, and preoperative comorbidities.

**Results:** 61,027 patients who underwent LRYGB or LSG had an available preoperative A1c. 3,453 patients (5.7%) had postoperative complications within 30 days of surgery. As illustrated in Table 1, preoperative A1c was inconsistently associated with an increased complication rate after LSG, with increased complications for A1cs 7.5-8.4, and 9-9.9, but not 8.5-8.9 or >10. When analyzed as a continuous variable, there was no association between A1c and postoperative complications for LSG. In patients who underwent LRYGB, there was no association between preoperative A1c and postoperative complications.

**Conclusion:** Preoperative A1c is inconsistently associated with postoperative complications after LSG. There is no association between preoperative hemoglobin A1c and postoperative complications in patients undergoing LRYGB, likely due to the more rapid improvement in glycemic control. These results suggest that more lenient preoperative blood glucose control does not lead to increased morbidity in patients undergoing LRYGB.

## A225

### Sleeve Gastrectomy Leak Managed by Malecot Drain

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Emory University<sup>1</sup>

#### Introduction:

Laparoscopic sleeve gastrectomy is a commonly performed bariatric procedure. Sleeve leaks are uncommon, occurring in 1-3% of cases but have potentially devastating consequences. Contemporary management of leaks includes nonoperative and endoscopic options, each with associated failure and reintervention rates. Regardless of approach, essential principles such as early initiation of antibiotics, source control, lavage, and drainage are the mainstays of treatment. For this presentation, we present a sleeve gastrectomy leak managed by laparoscopic transgastric malecot drain placement.

#### Video Description:

After obtaining intraabdominal access, the area abutting the left crus is dissected, freeing a large pocket of purulence. In rotating the gastric sleeve medially, the site of leakage at the uppermost staple line was identified. Prior to drainage control, the perisplenic abscess was bluntly freed, debrided, and irrigated. A pursestring suture with silk is placed and a 20 Fr malecot drain is inserted into the stomach lumen prior to securing the knot. Two additional 19 French Blake drains are placed into the retrogastric and perisplenic spaces. Omentum is further buttressed over the leak site. An intraoperative EGD confirms proper controlled drainage. The postoperative course out to 1 year is reviewed.

**A226**

**Giant Perforated Duodenal Ulcer after Vertical Banded Gastroplasty**

Amy Yetasook *fresno CA*<sup>1</sup>, Aaron Sabbota *Fresno CA*<sup>1</sup>, Pearl Ma *Fresno CA*<sup>1</sup>, Amarita Klar *Fresno CA*<sup>1</sup>, Keith Boone *Fresno CA*<sup>1</sup>, Kelvin Higa *Fresno CA*<sup>1</sup>  
UCSF - Fresno<sup>1</sup>

Duodenal ulcers are a known surgical emergency; however, unknown is the exact incidence, management, and complications of large perforations of duodenal ulcers, especially in regards to previous bariatric surgery. A giant perforated duodenal ulcer presents unique challenges in management. We present a case of a 45 year old gentleman with a remote history of vertical banded gastroplasty and abdominal pain. Workup ultimately revealed a chronic complex large ulcer with erosion of the vertical banded gastroplasty. Endoscopic and medical management was initially attempted but ultimately the patient required surgery. The patient underwent a laparoscopic lysis of adhesions, removal of the vertical banded gastroplasty band, subtotal gastrectomy with roux-en-y reconstruction, duodenal stump closure, and suture ligation of bile duct leaks from the erosive ulcer cavity created by the perforation. The patient did have a takeback to the OR and later presented with a duodenal stump leak; ultimately, the patient did well not only from healing from his ulcer but also improved his BMI. While giant perforated duodenal ulcer is rare, even more so in the context of bariatric surgery, laparoscopic surgical repair in this patient was safe. Expertise in bariatric revisions at a tertiary center is recommended.

**A227**

**Unusual Case of Bile Reflux after Roux-en-Y Gastric Bypass**

Pearl Ma *Fresno CA*<sup>1</sup>, Aaron Sabbota *Fresno CA*<sup>2</sup>, Amy Yetasook *fresno CA*<sup>2</sup>, Amarita Klar *Fresno CA*<sup>2</sup>, Keith Boone *Fresno CA*<sup>3</sup>, Kelvin Higa <sup>3</sup>  
UCSF Fresno/ALSA<sup>1</sup> Advanced Laparoscopic Surgical Associate<sup>2</sup> UCSF Fresno<sup>3</sup>

**Case Report:**

45 year old woman with prior laparoscopic retrocolic antegastric Roux-en-Y gastric bypass (RYGB) with complications of recurrent perforated marginal ulcers, revision to esophagojejunostomy, presented with several months bile reflux and emesis. Upper gastrointestinal series was negative, upper endoscopy found bile pooling in gastric pouch and roux limb, and HIDA scan did not show retrograde flow.

At laparoscopic exploration, we were unable to find a gastrogastic fistula after taking down minimal adhesions. As we could not explain her bile within the roux limb, it was decided to lengthen her 100 cm roux limb. After stapling off the biliopancreatic limb from the jejunojejunostomy and dividing the mesentery, a fistula was found from the biliopancreatic limb to the roux limb at the transverse mesocolic space. This was likely due to the closure of this potential space during the creation the retrocolic passage of the roux limb. This fistula was then stapled off and a new jejunojejunostomy, was then created distal to the prior

site. Postoperatively, the patient was discharged on day 1, and had no further bile reflux at follow ups.

### **Conclusion:**

Bile reflux after RYGB is rare however usually attributed to short roux limb, gastrogastic fistula, or Roux-en-O configuration. This the first reported case of a biliopancreatic fistula to the roux limb causing unexplained bile reflux after Roux-en-Y gastric bypass. Standard workup with imaging was unable to detect the fistula, and after surgical exploration and dissection of the jejunostomy, the fistula was found.

## **A228**

### **Laparoscopic Management of Small Bowel Obstruction Secondary to Intra-Gastric Balloon Migration**

Ravi Aggarwal *London*<sup>1</sup>, Kai Tai Derek Yeung *London*<sup>1</sup>, Charalampos Haris Markakis *London*<sup>2</sup>, Ahmed Ahmed *London*<sup>1</sup>  
Imperial College London<sup>1</sup> University Hospital Lewisham<sup>2</sup>

### **BACKGROUND:**

The intragastric balloon (IGB) has been used as a temporary measure for weight reduction in the morbidly obese. The Elipse™ IGB is a capsule that is swallowed before being filled with 550mL of fluid and resides in the stomach for four months before being excreted from the gastrointestinal tract. Serious complications related to the device remain rare.

### **METHODS:**

We present an unusual case of a 41-year-old woman presenting to our hospital following two days of abdominal pain and vomiting. She had an Elipse™ IGB inserted three months prior in Saudi Arabia. On examination her abdomen was distended and mildly tender on the right side. Computed tomography showed dilated small bowel with a transition zone in the mid jejunum associated with a foreign body.

### **RESULTS:**

Laparoscopy was performed and the transition point found in the mid-jejunum. An enterotomy was made at the transition point where the balloon was visualised intra-luminally and then extracted whole. The enterotomy was closed with intracorporeal continuous absorbable sutures. The IGB was removed from the abdominal cavity in an EndoCatch device. Upper GI endoscopy was also performed to exclude any remnant of the IGB remaining in the stomach. The patient developed paralytic ileus post-operatively which was managed conservatively and was discharged day 6 post op.

### **CONCLUSION:**

Although initial data has shown the Elipse™ IGB to be a relatively safe and efficacious temporary measure for weight reduction, rarely complications can occur. General surgeons should be alert to this and early imaging and laparoscopy are essential for management.



## A229

### **Duodenal Switch: Small Bowel Obstruction and Internal Hernias**

Peter Ng *Raleigh NC*<sup>1</sup>, Lindsey Sharp *Raleigh NC*<sup>1</sup>, Dustin Bermudez *Raleigh NC*<sup>1</sup>  
North Carolina Surgery/ Rex Bariatric Specialists<sup>1</sup>

Duodenal Switch post-operative complications include small bowel obstruction and internal hernias. This video presentation discusses the common causes for small bowel obstruction, demonstrating single band adhesions, mesocolic internal hernia, and mesoenteric internal hernia, including clinical presentation, radiographic evaluation, reduction technique, and repair.

## A230

### **Laparoscopic Antegrade Sleeve Gastrectomy in the setting of a Ventral Hernia with Loss of Domain**

Samuel Brown *Papillion NE*<sup>1</sup>, Emily Brown *Louisville KY*<sup>1</sup>, Robert Fitzgibbons *Omaha NE*<sup>1</sup>,  
Kalyana Nandipati *Omaha NE*<sup>1</sup>  
Creighton University Medical Center<sup>1</sup>

In this video presentation, we present a laparoscopic antegrade sleeve gastrectomy in a 67 year-old male with morbid obesity (BMI 45) and a complex ventral hernia with substantial loss of domain. This patient presented to our clinic with a large ventral hernia that extended down to his knees. Immediate abdominal wall reconstruction was thought to be at high risk of failure given his morbid obesity. The patient had failed multiple weight loss programs, and thus we considered surgical weight loss options for him. Pre-operative imaging showed that the majority of the patient's stomach was contained within the hernia sac, along with the rest of his intra-peritoneal organs. We offered the patient a laparoscopic sleeve gastrectomy. This case is unique because the operation was performed predominantly within the hernia sac, rather than within the true abdomen. Post-operatively, the patient developed a mild acute kidney injury that resolved with fluid administration. He had no other complications and he was discharged from the hospital on post-operative day 4. At his 6 week follow up appointment, the patient had lost 34 lbs and his BMI had decreased from 45 to 39. Conclusion: Laparoscopic antegrade sleeve gastrectomy can be a feasible option for patients with complex ventral hernias that involve significant loss of domain and challenging anatomy.

## A231

### **Laparoscopic Repair of Chronic Gastro-cutaneous Fistula from the Excluded Stomach 19 years after Gastric Bypass**

Anirudha goparaju *LONG ISLAND CITY NY*<sup>1</sup>, Patricia Cherasard *Garden City NY*<sup>1</sup>, Venkata Kella *Garden city NY*<sup>1</sup>, Jun Levine *Garden City NY*<sup>1</sup>, Collin Brathwaite *Patchogue NY*<sup>1</sup>  
NYU winthrop<sup>1</sup>

#### Introduction:

Gastrocutaneous fistula after gastric bypass is a rare complication. Causes include iatrogenic, traumatic or inflammatory etiologies. Pain and wound complications are debilitating. Multiple approaches exist including percutaneous, endoscopic, and surgical options. Endoscopic approaches involve clipping and fistula plugs and stenting to seal and exclude the fistula.

#### Methods:

We present a case of a 75-year-old woman with a history of open non-divided gastric bypass 19 years prior that presented with a chronic draining intercostal wound. This started after a thoracoscopic lung and rib resection that was complicated by an infected wound requiring debridement. Surgical history includes splenectomy, abdominoplasty, and ventral herniorrhaphy. The diagnosis was confirmed by fistulogram, which revealed filling of the excluded stomach. Endoscopic approach was not feasible due to the location. Despite multiple abdominal surgeries, a minimally invasive approach was feasible. Access was gained via optical trocar insertion into the right upper quadrant. Additional access ports were placed in the right flank. Extensive adhesive disease was encountered and dissected sharply. The fistula was identified in the left upper quadrant and with great care the tract was dissected circumferentially and sharply divided. The portion of the excluded stomach with the fistula was resected with a linear stapler. The overlying abdominal wall was debrided and packed.

#### Results:

The patient had a normal upper GI and was discharged home with local wound care after tolerating a diet on post-operative day 4.

#### Conclusion:

A minimally invasive surgical approach is feasible to manage chronic gastrocutaneous fistula in the setting of multiple prior surgeries.

#### **A232**

#### **A Video of an Iatrogenic Portal Vein Injury during Duodenal Dissection for Single Anastomosis Duodeno-Ileal Bypass**

Scott Steinberg *Decatur GA*<sup>1</sup>, Amit Surve *South Salt Lake City UT*<sup>2</sup>, Daniel Cottam *salt lake city UT*<sup>3</sup>, Benjamin Horsley *Salt Lake City UT*<sup>2</sup>, Samuel Cottam <sup>2</sup>

Emory Healthcare<sup>1</sup> Bariatric Medicine Institute<sup>2</sup> Bariatric Medical Institute<sup>3</sup>

The single anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S) surgery is technically demanding because of duodenal dissection over the head of the pancreas. However, there have not been any reports of extra-hepatic portal triad injury during duodenal dissection. Herein we report the first case of a portal vein injury during duodenal dissection. Additionally, we attempt to demonstrate the root cause of this intra-operative complication, and how to avoid this type of injury in the future.

#### **A233**

# **LAPAROSCOPIC HIATAL HERNIA REPAIR AND POUCH PEXY IN A ROUX-EN-Y GASTRIC BY-PASS PATIENT**

Cristina Vila Zarate *Weston*<sup>1</sup>, Maria Fonseca *Weston FL*<sup>1</sup>, Vicente Cogollo *Weston FL*<sup>1</sup>, Emanuele Lo Menzo *Weston FL*<sup>1</sup>, Samuel Szomstein *North Miami Beach FL*<sup>1</sup>, Raul Rosenthal *Weston FL*<sup>1</sup>  
Cleveland Clinic Florida<sup>1</sup>

## **Introduction**

Hiatal hernia is a common disease with a high prevalence among population with obesity due to the increase in the intra-abdominal pressure.

## **Objective**

To present a laparoscopic video of a hiatal hernia fixing with pexy of the triangular ligament after a previous repair and Roux in Y Gastric Bypass.

## **Methods**

We present a case of a 67 years old female with severe reflux symptoms of 2 months of evolution that did not resolve with medication. She had a surgical history of Roux en Y Gastric Bypass and Hiatal hernia repair in the same operative procedure 11 years ago. In the OR after accessing the abdominal cavity the liver was cranially retracted. GE junction was exposed and a type 2 hiatal hernia with herniation of the pouch into the mediastinum was visualized. We dissected between the pouch, Liver, the right and left crus of the diaphragm until we were able to take down and reduce the pouch into the abdominal cavity. We reestablished the length of the intra-abdominal esophagus, then the diaphragmatic crus was suture posteriorly and anteriorly with running and figure of eight with 2.0 Prolene Quill Suture respectively, the pouch was then fixated to the triangular ligament with interrupted 0 silk sutures.

## **Results**

The procedure was completed without complications and the patient tolerated it very well, with minimal blood loss, the patient was discharged home postoperative on day 1.

## **Conclusion**

Closure of the diaphragm with barbed suture and pexy of the triangular ligament showed great results.

#### **A234**

##### **Laparoscopic Reversal of a Gastric Bypass for Shortcut from a missed Internal hernia.**

Rana Pullatt *Mt Pleasant SC*

Medical University of South Carolina

The patient had a Roux en Y gastric bypass two years ago and had presented to an outside hospital for increasing abdominal pain. The patient was evaluated in the ER and was evaluated with a CT scan which was read as normal with no obstruction. General Surgery was consulted and felt patient would be appropriate for a medical floor bed. Patient was admitted to the medicine service with presumed diagnosis of marginal ulcer, placed on PPI and pain medications and GI medicine consult was obtained. Gastroenterology agreed with PPI's and scheduled pt for outpatient endoscopy after discharge. Over the weekend patient's pain medications were escalated and on Monday morning patient begged his attending physician and stated " this amount of pain cannot be normal". The attending physician arranged for an inpatient endoscopy, Endoscopy revealed a necrotic roux limb. The patient was then transferred emergently to a nearby hospital that had a Bariatric Surgeon who emergently explored the patient and found necrotic bowel from an internal hernia with volvulus and resected bowel and refashioned the gj and recreated a jejunojejunostomy. Patient was left with 200 cm of total small bowel length with a 50 cm roux limb. Over the next several months patient had tremendous diarrhea and was treated with antidiarrheal agents, gatex and enteral supplementation. When pt was referred to us his albumin was 1.2 with anasarca. for 3 months he was given TPN and when his albumin was 2.8 we took him for a reversal.

#### **A235**

##### **Removal of and Revision after Horizontal Mesh Gastroplasty for Dysphagia and Obstruction**

Victoria Lyo *Portland OR*<sup>1</sup>, Yalini Vigneswaran *Portland*<sup>1</sup>, Andrea Stroud *Portland OR*<sup>1</sup>, Farah Husain *Portland OR*<sup>1</sup>

Oregon Health & Science University<sup>1</sup>

A 67-year-old woman underwent two prior bariatric operations, the latter in 1982 believed to be a horizontal mesh band gastroplasty. She had chronic history of nausea, vomiting and esophagitis, and was transferred acutely to our tertiary referral bariatric center with worsening symptoms of gastric obstruction. Endoscopy showed an hourglass stomach with a waist-like stricture in the mid-stomach. This stricture was dilated to 18 mm, but her symptoms did not improve and an upper GI study showed significant esophageal and proximal gastric dilation with a persistent mid-body narrowing. A PEG-J tube was placed to allow for proximal gastric

decompression with the distal “jejunal” tip placed in the distal stomach to allow for nutrition optimization.

After her nutrition labs improved, she was taken for a laparoscopic removal of a mesh band that was noted to be a horizontal banded gastroplasty configuration. A horizontal gastro-gastrostomy was then performed to create a wide lumen, relieving her gastric stricture. Patency of the gastro-gastrostomy was confirmed on intraoperative endoscopy, and she was discharged on post-operative day 2 tolerating a soft diet. However, she developed recurrent nausea at one month and is currently getting worked up with an upper GI study and endoscopy.

## **A236**

### **Incidental Gastric Remnant Erosion in a Patient with Band Over Bypass**

Andres Narvaez *Durham NC*<sup>1</sup>, Juan Esteban Perez *Durham NC*<sup>1</sup>, Daniel Guerron *Durham NC*<sup>1</sup>, Jin Yoo *Durham NC*<sup>1</sup>, Andrew Luhrs *Durham NC*<sup>1</sup>  
Duke University<sup>1</sup>

Although gastric bypass (RYGB) is a common bariatric procedure in the US, it has been associated with a failure rate of 15%. The addition of an adjustable gastric band (LAGB) to (RYGB) was considered to be a useful revision strategy in patients with inadequate weight loss. Band erosion is known to be one of the major complications after LAGB with a reported incidence of band erosion of 28%. Band over bypass is not a common procedure, but has been used in some cases for weight regain.

We present a 56 year old female with a status post RYGB which was revised to band over bypass with a BMI of 39 kg/m<sup>2</sup>. She has complained of weight regain, significant reflux, and dysphagia for the past few years. Given the significant esophagitis on the EGD and findings of pre-operative UGI, we recommended removal of her LAGB.

After the removal of the LAGB and a negative air leak test, some brown fluid coming from the band track area was evidenced. An occult band erosion in the gastric remnant was identified and repaired with a Graham's patch.

In conclusion a falciform buttress can be used to repair an ulcer in the stomach remnant. This case may shed light on how a band erosion occurs in general. While some people advocate that band erosion occurs due to the band being too tight for too long, in this case the mechanism of band erosion may have more to do with tension from the anterior plication sutures.

## **A237**

### **Laparoscopic conversion to Roux en Y Gastric Bypass and Ligamentum Teres Cardiopexy for Gastroesophageal and Bile Reflux after Sleeve Gastrectomy**

Aaron Sabbota *Fresno CA*<sup>1</sup>, Amy Yetasook *fresno CA*<sup>1</sup>, Pearl Ma *Fresno CA*<sup>1</sup>, Keith Boone *Fresno CA*<sup>1</sup>, Kelvin Higa *Fresno CA*<sup>1</sup>, Amarita Klar *Fresno CA*<sup>1</sup>  
Fresno Heart and Surgical Hospital<sup>1</sup>

Subtle aberrations in the post-sleeve stomach may result in severe gastroesophageal and bile reflux. Cardiopexy of the stomach with the ligamentum teres, initially described in 1964 by Pedinielli, has been used to reinforce the lower esophageal sphincter and hinders mediastinal retraction of the stomach. However, diversion of duodenal contents is required for definitive treatment of bile reflux. The presented video depicts a case of 37 year-old female presenting with frequent regurgitation and reflux refractory to medical therapy 5 years after laparoscopic sleeve gastrectomy. Preoperative endoscopy was consistent with esophagitis and bile within the gastric sleeve. UGI showed delayed reflux and a small sliding hiatal hernia. Retained bile in the proximal sleeve was seen on intraoperative endoscopy. Hiatal dissection revealed laxity of the phrenoesophageal membrane. Retained posterior fundus was discovered with mobilization of the sleeve. The sleeve was transected to define the pouch. The ligamentum was released from the anterior abdominal wall and isolated from the falciform. A gastrotomy was performed to identify the z-line and ensure creation of a small pouch to minimize acid cell mass. A 100cm roux limb was brought in an antecolic, antegastric orientation after creation of a jejunojeunostomy. A handsewn single layer gastrojejunostomy was performed. Following a leak test, the ligamentum teres was wrapped around the gastroesophageal junction and secured. Endoscopy was repeated to assess the tightness of the wrap. Mesenteric defects were closed. Patient was discharged on clear liquids on post-operative day 2. 60 days post-operatively the patient was without symptoms.

## A238

### **RARE FINDINGS DURING SLEEVE GASTRECTOMY: SITUS INVERSUS TOTALIS**

Gustavo Bello *Towson MD*<sup>1</sup>, Elizabeth Dovec *Towson MD*<sup>1</sup>  
Greater Baltimore Medical Center<sup>1</sup>

#### Introduction

Situs inversus is a congenital condition in which the major visceral organs are mirrored from their normal position. Its incidence is about 1 in 10,000 people. This condition is usually diagnosed incidentally during childhood although is not uncommon to be found for the first time in the adult patient.

Performing surgery on this patient population for the most part results in many challenges for the surgeon due to unfamiliar anatomy and mandatory changes to surgical technique.

It is more than likely that the vast majority of bariatric surgeons will never come across with a patient with a **Situs Inversus Totalis** et alone to happen as an incidental finding, reason why is important to share and document these rare cases and how it was handled.

#### Methods

26 years old female, 5'7" tall and 306 Lbs. for a BMI of 47.9. She had no past medical or surgical history therefore her preoperative work up only included a history and physical, EKG and routine blood work. She was deemed good candidate for a Sleeve Gastrectomy.

### Results

Procedure went uneventful. She was discharged POD #1 and seen in clinic at 8 weeks when she had lost already 32 Lbs.

### Conclusion

Performing a Laparoscopic Sleeve gastrectomy on a patient with Situs Inversus Totalis is feasible and safe even when is found incidentally however it is a technically challenging operation due to the unfamiliar anatomy, the fight against muscle memory and the need for improvisation.

### **A239**

#### **When all the gastric bypass goes north : The emergency management of an acute complex para-oesophageal hernia post Roux-en-Y gastric bypass .**

SHERIF Hakky *LONDON*<sup>1</sup>, NIKOLETTA PETROU *London*<sup>1</sup>  
IMPERIAL COLLEGE LONDON<sup>1</sup>

A 30 year-old female was admitted with a five-day history of chest and abdominal pain with vomiting and constipation . She had undergone laparoscopic Roux-en-Y gastric bypass in Chile five months prior. Her medical history included Ehlers Danlos syndrome (vascular type) and bipolar disorder. A CT chest and abdomen revealed a large diaphragmatic hernia with small bowel, gastric pouch and gastric remnant within the left hemithorax. She was transferred to St Mary's Hospital under the care of the Bariatric Surgery team and underwent an emergency laparoscopy. A large hiatus hernia was identified with a perforated jejunojejunostomy adherent to the hiatus. The hiatus hernia contents (Roux limb, biliopancreatic limb, gastric pouch, gastric remnant, omentum) were manually returned to the abdominal cavity. The perforated jejunojejunostomy was then resected and the biliopancreatic and Roux limbs were re-anastomosed onto the new common channel using a linear stapler. The hiatus was subsequently repaired with interrupted non-absorbable sutures. Upon closure of the hiatal defect, a left tension pneumothorax immediately developed. This was successfully relieved with insertion of a 30 Robinson's abdominal drain into the hiatus and left hemithorax. The patient recovered well post-operatively and the drain was removed on day five. A water-soluble contrast swallow on day seven confirmed successful repair of the hiatus hernia, without evidence of anastomotic leak or narrowing. The patient made an uncomplicated recovery and was discharged home. This case highlights an unusual late complication of bariatric surgery that can be successfully managed laparoscopically when early Bariatric Specialist input is sought.

## A240

### **Laparoscopic Revision of Biliopancreatic Diversion with Duodenal Switch for Severe Malnutrition and Recurrent and Recurrent Urinary Stones**

David Kelly *Morgantown WV*<sup>1</sup>, John Mourany *Morgantown WV*<sup>1</sup>, Abdulrahman Al Halak *Morgantown WV*<sup>1</sup>, Lawrence Tabone *Morgantown WV*<sup>1</sup>, Nova Szoka *Morgantown WV*<sup>1</sup>, Salim Abunnaja *Morgantown WV*<sup>1</sup>  
West Virginia University<sup>1</sup>

Biliopancreatic diversion with duodenal switch (BDP-DS) is a complex and highly effective method of treating patients with obesity. BDP-DS is not widely adopted within the bariatric surgery community partly due to the potential for morbidity, particularly nutritional deficiencies and malnutrition. Management of these nutritional deficiencies and malnutrition can include aggressive medical measures or even surgical revision.

This video case report demonstrates a revision of a BPD-DS due to severe and refractory malnutrition. A 62 year old male with a history of morbid obesity treated with a laparoscopic BPD-DS in 2004 presented with severe malnutrition and associated complex urological complications. Aggressive enteral feeding regimens had been attempted without success. Parenteral nutrition was used to prehabilitate the patient so that they would tolerate and heal a revisional procedure. We demonstrate a laparoscopic revision of a BPD-DS by way of lengthening the common channel by adjusting the entry of the alimentary limb much more proximally on the biliopancreatic limb. After the revision, the patient's nutritional parameters and general health showed significant signs of improvement. Several months post-operatively, the patient is maintaining a healthy weight and is without continued complications due to nutritional deficiencies.

Laparoscopic revision of BPD-DS by lengthening the common channel is a safe and effective method of treating severe malnutrition after BPD-DS.

## A241

### **Laparoscopic Resection of Excluded stomach for Incidental GIST tumor.**

Rana Pullatt *Mt Pleasant SC*  
Medical University of South Carolina

The patient was referred for a conversion of a gastric bypass to a duodenal switch for weight regain. The patient had a gastric bypass 15 years ago and had regained all of her weight. Since we did not have access to her operative records we performed a ct scan of her abdomen to evaluate her anatomy. Incidentally a large mass was found in the excluded stomach. A push enteroscopy was performed to biopsy and characterize the mass. The biopsy was consistent with a spindle cell neoplasm located along the lesser curve in the antrum of the stomach. Laparoscopic Resection was performed and adjuvant Gleevec therapy was given due to the size of the tumor. This case highlights the possibility of unexpected findings in the excluded stomach.



## A242

### **SADI-S TO RYGB FOR SEVERE REFLUX AND ESOPHAGITIS**

Amador Garcia Ruiz de Gordejuela *Barcelona*<sup>1</sup>, Ramon Vilallonga Puy *Barcelona*<sup>1</sup>, Renato Roriz da Silva *Rondonia*<sup>1</sup>, Enric Caubet Busquet<sup>1</sup>, Oscar González López<sup>1</sup>, Miquel Kraft Carre *Barcelona*<sup>1</sup>, Ruth Blanco-Colino *Barcelona*<sup>1</sup>, Rocío Martín Sánchez<sup>1</sup>, Carlos Petrola *Barcelona*<sup>1</sup>, Jose Fort López-Barajas<sup>1</sup>  
Vall d'Hebron University Hospital<sup>1</sup>

**Introduction.** Sleeve gastrectomy is clearly related to gastroesophageal reflux and esophagitis. This complication may apply also for malabsorptive procedures that include sleeve gastrectomy as SADI-S.

**Methods.** We present a case of a staged SADI-S who presented de novo severe reflux. Patient was studied and a severe reflux with altered manometry and pHmetry. Patient did not response for conservative management. The patient was converted to RYGB.

**Result.** After examining the anatomy of the SADI-S no hiatal hernia was found. The sleeve was fine and a little bit dilated. The Duodeno-Ileal anastomosis was dissected and sectioned. Next the distal stomach was dissected up to the point of section for the new pouch. The distal stomach was completely resected. Finally, a conventional simplified RYGB was completed. Patient did well and was discharged with improving of symptoms.

**Conclusion.** Conversion from SADI-S to RYGB is technically feasible and a practical option for patient developing new onset of gastroesophageal reflux.

## A243

### **Intractable Hiccups: A Case of A Paraesophageal Hernia In A Roux En Y Gastric Bypass**

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A unique case of intractable hiccups. Patient is 48 years old with severe hiccups followed by burping which relieves his chest pain, nausea and vomiting, and severe heartburn and reflux. He has a remote history of Nissen fundoplication that was revised into a roux en y gastric bypass. He also had a prior hiatal hernia repair. This over time yielded weight loss and resolution of symptoms. The then had the above symptoms start with findings as described by the video presentation.

## A244

## **Management of bile reflux after Single-Anastomosis Duodenal Switch (SADS): Conversion to RYGB**

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University of Missouri Health Care<sup>1</sup>

Single-anastomosis duodenal switch (SADS) procedures offer a powerful metabolic surgery option with potentially technical advantages during surgery. While uncommon, significant bile reflux symptoms can develop in the post operative period. This can lead to symptomatic bile reflux gastritis and esophagitis. Management of these symptoms can be accomplished with a variety of non operative and operative interventions. Should conservative or medical therapy be insufficient, surgical options can be considered. This video case report highlights a potential management option: the laparoscopic conversion of a SADS to RYGB anatomy. We describe the technical aspects of the procedure and the initial post operative follow up.

### **A245**

## **Robotic Repair of Symptomatic Hiatal Hernia 6 Years after Successful Roux-en-Y Gastric Bypass**

Darren Tishler *Glastonbury CT*<sup>1</sup>, Richard Seip *Glastonbury CT*<sup>1</sup>, Pavlos Papasavas *Hartford CT*<sup>1</sup>  
Hartford Hospital<sup>1</sup>

### **Background:**

A 55 y/o Female, current BMI 31 underwent a laparoscopic ante-colic, ante-gastric Roux-en-Y gastric bypass 6 years prior to presentation to our practice. Her original surgery and recovery were unremarkable and she had excellent weight loss. Recently, she has had a 5-month history of progressive dysphagia, regurgitation, reflux, and cough. Additional symptoms include chest pain and occasional vomiting with relief of symptoms. As part of a workup for her symptoms, an UGI demonstrates gastric pouch migration to the mediastinum with a radiographic diagnosis of “achalasia” due to a birds-beak appearance of the gastrojejunal anastomosis.

### **Methods:**

This video shows our robotic technique for exploration of the GE junction revealing a sliding type 1 hiatal hernia. The gastric pouch and GJ anastomosis was reduced and a posterior repair was performed, facilitated with an intra-operative endoscopy. A biosynthetic polymer web scaffold mesh was used to reinforce the repair.

### **Results:**

The patient had resolution of most symptoms including reflux and regurgitation. Early after surgery, she had some mild dysphagia and mild gas-bloat syndrome. Both improved with dietary coaching. There was no significant change in her BMI.

### **Discussion:**

New onset GERD symptoms should be carefully evaluated after RYGB surgery. These hiatal hernias can present with atypical symptoms that may or may not be related to eating. As a result, these symptoms should not necessarily be attributed to poor dietary habits. Hiatal hernias can be

missed at initial surgery or develop de novo after bariatric surgery, leading to significant nutritional and functional disability.

#### **A246**

##### **High-Grade Small Bowel Obstruction Caused by Adjustable Gastric Band Tubing**

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Yale School of Medicine<sup>1</sup> Yale School of Medicine, Department of Surgery<sup>2</sup>

There has been a sharp decline in laparoscopic adjustable gastric band (LAGB) placement, making up less than 3% of the US bariatric procedures in 2017. This decline is due to high rate of long-term failure, and myriad of complications including device malfunction, band slippage, esophageal and pouch dilation, and gastric erosion. We present a rare case of high-grade small bowel obstruction caused by gastric band tubing.

A 37-year old female with history morbid obesity, current BMI 41.94 kg/m<sup>2</sup>, status post LAGB in 2010, presented with 24 hours of severe abdominal pain, nausea, bilious vomiting, and obstipation. Her vitals signs were within normal limits. On examination she had tenderness throughout her abdomen without signs of peritonitis. Lab was significant for leukocytosis of 14.8 x 1000/ $\mu$ L. Computed tomography of abdomen and pelvis revealed high-grade small bowel obstruction, likely caused by to the band tubing. Following nasogastric tube decompression, she was taken to the operating room for emergent laparoscopic exploration and band removal. The band tubing was wrapped tightly around the small bowel mesentery causing obstruction and intestinal ischemia, requiring extensive adhesiolysis. The band, tubing, and subcutaneous port were removed and the intestine appeared viable. Her postoperative course was uneventful as diet was advanced slowly and she was discharged home on postoperative day 5. She has been asymptomatic since surgery and is scheduled for laparoscopic Roux-en-Y gastric bypass in the near future.

#### **A247**

##### **Minor and Major Petersen's Herniation after Antecolic Roux-en-Y gastric Bypass: An Impending Catastrophe.**

Thuy Tran *Chicago IL*<sup>1</sup>, Rami Lutfi *Chicago IL*<sup>1</sup>

University of Illinois at Chicago<sup>1</sup>

Introduction: We present two patients who presented with mild and intermittent abdominal pain after antecolic Roux-en-Y gastric bypass with excellent weight loss and resolution of comorbidities. After negative diagnostic imaging studies, the patients underwent diagnostic laparoscopy to rule out internal hernia.

Methods: We identified the Roux limb, which was antecolic, and followed this down to find the jejunojejunostomy. The jejunojejunostomy was on the right, which was indicative of an internal hernia. We continued to run the Roux limb and found that there was a twist. In the first case, nearly the entire small bowel was herniated through Petersen's defect. In the second case, approximately 15-cm of the biliopancreatic limb was herniated through Petersen's defect. To reduce the hernia, lysis of adhesions was performed as to take down the adhesions between the split omentum and mesocolon. After the intestines were entirely reduced to the correct anatomic position, we closed the defect by re-approximating the base of the mesentery of the Roux limb and the mesocolon, thereby ensuring the space was completely obliterated.

Conclusion: Most surgeons who perform antecolic Roux-en-Y gastric bypass do not close Petersen's defect as it is a very large defect that is unlikely to strangulate. Although these patients who do develop herniation rarely present with severe abdominal pain or obstruction, there should be a low threshold for diagnostic laparoscopy as it has the potential to be catastrophic.

#### **A248**

#### **Robotic Conversion of Gastric Band to Single Anastomosis Duodenal Switch**

Netanel Alper *New York NY*<sup>1</sup>, Dimitar Ranev *New York NY*<sup>1</sup>, Edward Yatco *New York NY*<sup>1</sup>  
Lenox Hill Hospital - Northwell Health<sup>1</sup>

#### Introduction:

The adjustable gastric band has become increasingly disfavored in recent years, as patients frequently experience recidivism or other complications. The bariatric surgeon is often called upon to provide a solution in the form of revision. Conversion to a single anastomosis duodenal switch is feasible and highly effective, promoting further weight loss in such patients.

#### Case:

This is a 46 year old female who underwent gastric banding in 2008, lost 100 pounds and regained all weight lost, presenting with a BMI of 38.3. She opted to have the band removed and undergo conversion to single anastomosis duodenal switch.

#### Methods:

Four robotic trocars were placed, with an additional trocar for liver retraction. Adhesions surrounding the band were lysed, the omentum was divided off the greater curvature of the stomach, and the band was removed. A gastric sleeve was created with the robotic stapler, and the omentum was sutured to the new greater curvature. The first portion of the duodenum was divided, and a loop duodenoileostomy was created 300cm proximal to the ileocecal valve. A leak test was negative, and the procedure was concluded. She was discharged two days later without issue, and had no complications within thirty days post-operatively. She lost 30 pounds by her three month office visit.

#### Conclusion:

Conversion to a single anastomosis duodenal switch is a viable and effective option for patients

with recidivism following bariatric surgery. The process is aided by use of a robotic approach, and the single anastomosis technique, and provides excellent post-operative weight loss.

#### **A249**

##### **Laparoscopic Duodenal Switch After Sleeve Gastrectomy (2nd Stage). Technical Pearls.**

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Clinique Michel Gagner MD Inc.<sup>1</sup> Westmount Square Surgical Center<sup>2</sup>

Sleeve gastrectomy is one of the most popular bariatric surgical procedure in the World, currently being performed almost 3 times more than Roux-en-Y gastric bypass. After 5 years, weight regain is possible. Also, sleeve gastrectomy followed by duodenal switch has been initially described as a two-stages procedure for super-obese patients. Here, we described the technical pearls, including dissection of the antrum, inferior pyloric vessels and the first part of the duodenum, with complete duodenal transection. The upper anastomosis, a duodeno-ileostomy, end to side, antecolic is performed with the ileal loop first, with hand-sewn techniques. The second anastomosis, an ileo-ileostomy side to side follows, with both linear and hand sewn techniques. Importantly, to avoid internal hernias, both mesenteric defects are closed on the left side, the ileo-ileostomy mesenteric defect, and the Petersen's defect, between the transverse mesocolon and the ileum mesentery. We describe this in a 40 y.o. patient who had an initial sleeve gastrectomy when the BMI was 54.7 kg/m<sup>2</sup> and was successfully lowered to 24.3 kg/m<sup>2</sup>. After 6 years, the weight had progressively increased to a BMI of 39.5 kg/m<sup>2</sup> and an hypoabsorptive surgery was offered, since she was super-obese initially. After nearly 6 months, BMI had decreased to 29.3 kg/m<sup>2</sup>. The second stage is ideal for these patients because the duodenum has not been operated before, with excellent blood supply, and offer a tension free anastomosis. This hypoabsorptive surgery is also ideal when the gastric tube of the sleeve is not tremendously enlarged.

#### **A250**

##### **A case of food intolerance after sleeve gastrectomy**

Melissa Beitner *New York NY*<sup>1</sup>, Daniel Herron *New York NY*<sup>1</sup>, Aaron Birnbaum *NEW YORK NY*<sup>1</sup>,  
Aryan Meknat *Brooklyn NY*<sup>1</sup>  
Mount Sinai Medical Center<sup>1</sup>

In this video presentation we present a case of food intolerance after sleeve gastrectomy. The patient is a 68-year-old female with a BMI of 35.8kg/m<sup>2</sup> who underwent a laparoscopic sleeve gastrectomy and hiatal hernia repair at an outside hospital. Soon after her initial procedure she developed progressive dysphagia, vomiting and chest discomfort. She was seen by a gastroenterologist. Manometry was inconclusive. The patient underwent seven pneumatic balloon dilatations of a presumed esophageal stricture without durable symptomatic relief before she was referred to surgery.

An upper GI series was ordered and revealed a paraesophageal hernia. The patient underwent an uncomplicated hiatal hernia repair as shown in this video.

It is important to consider hiatal hernia in a patient presenting with dysphagia after sleeve gastrectomy. An upper GI series is a useful test to confirm the diagnosis. Though left-sided dissection may be challenging due to staple line scarring, a complete mobilization is required. Adequate intra-abdominal esophageal length may be confirmed with the use of on table endoscopy and minimizes tension on the repair. Esophageal pexy sutures may help secure the repair.

## **A251**

### **Laparoscopic conversion in two steps: From Aspire to sleeve, from sleeve to SASI**

Stephan Axer *Torsby*

Torsby Hospital

#### Background:

Aspiration-systems have previously been described as a novel procedure in bariatrics. Complications, weight-failure and inadequate improvement of obesity-related comorbidities ought to be regarded as indication for revisional bariatric surgery.

#### Method:

Case-report based on operation video-sequences illustrating the laparoscopic conversion from a “post-Aspire” status to a gastric sleeve as a first step and from sleeve to single anastomosis sleeve-ileal bypass (SASI) as a second step.

#### Result:

A 54-year old woman presented to our out-patient department three years after implantation of an “Aspire”-system. Due to a persistent local subcutaneous infection the advice had been removed after 6 months.

The BMI was 48, she suffered from hypertension and type 2 diabetes treated with Metformin and insulin. After a multidisciplinary evaluation the preliminary decision was made to perform a sleeve gastrectomy as a first step procedure followed by a duodenal switch ad modum SADI as a second step.

Laparoscopy revealed tight adhesions between the duodenum, the pylorus-region and the falciform ligament. The sleeve gastrectomy could be performed with the prior entry-point of the “Aspire”-system as a part of the specimen. Due to the adhesions distally of the pylorus, the initial strategy was revised. As a second step, a SASI-procedure was performed instead of a duodenal switch.

The postoperative course was uneventful. The patient lost 65% of excess weight, had an improvement of hypertension and a complete remission of diabetes.

#### Conclusion:

Laparoscopic conversion to SASI in two steps after prior “Aspire” is feasible regarding risk-stratification, weight-loss and improvement of comorbidities.

**A252**

**Robotic Revision of Chronic Marginal Ulcer and Bilateral Truncal Vagotomy Following a Roux en Y Gastric Bypass**

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St Luke's University Hospital and Health Network<sup>1</sup> St Luke's University Hospital<sup>2</sup>

**Background/Introduction:**

Marginal ulceration can occur in up to 20% of cases. The etiology is unclear. Many authors have suggested that smoking, fistula, H. Pylori infection, foreign bodies, NSAID use or even obstructive sleep apnea status can contribute to the development of marginal ulceration. In addition a large gastric pouch with a non-excluded fundus containing parietal cells (oxyntic cells) can produce acid which can lead to the development of marginal ulcer. The treatment of marginal ulceration is usually supportive with diet modification and PPI in addition to sucralfate. In refractory cases patient may have to undergo a revision. Revisional bariatric cases are technically challenging and are associated with increased complications. The use of the robotic platform in bariatric surgery remains controversial. However, robotic surgery can offer many advantages in revisional surgery and potentially lead to improved outcome.

**Objective:**

To illustrate the use of robotic surgery in a revisional bariatric case.

**Methods:**

In this video we demonstrate the case of a 56 yo male s/p laparoscopic gastric bypass (BMI=32) who developed a chronic marginal ulcer and failed medical management. Patient was found to have a large pouch on preoperative endoscopy which may have contributed to the development of the ulcer. Patient underwent a robotic revision of the gastrojejunostomy ulcer in addition to bilateral truncal vagotomy

**Results:**

Patient did very well and was discharged on POD#1

**Conclusion:**

Robotic revision of gastric bypass is safe and effective and provides the advantages of better dissection and easier hand sewn reconstruction of the gastrojejunostomy anastomosis

**A253**

**ICG-guided revisional bariatric surgery**

Arielle Lee *La Jolla CA*<sup>1</sup>, Ryan Broderick *La Jolla CA*<sup>2</sup>, Joslin Cheverie *La Jolla CA*<sup>2</sup>, Bryan Sandler *La Jolla CA*<sup>2</sup>, Garth Jacobsen *La Jolla CA*<sup>2</sup>, Santiago Horgan *La Jolla CA*<sup>2</sup>  
University of California, San Diego<sup>1</sup> UC San Diego<sup>2</sup>

**Introduction:** Bariatric surgery has been clearly established as a safe and effective treatment for morbid obesity and its associated comorbidities.

Prior studies have shown that reoperative bariatric surgery tends to be more technically challenging than index bariatric procedures, and has a higher rate of 30-day morbidity. It has also been shown that in the hands of a skilled surgeon with high revisional bariatrics volumes, rates of complications with revision bariatric surgery are acceptable.

**Case Report:** The patient is a 54 year old female with PMH significant for GERD and lupus, s/p laparoscopic Roux-en-Y gastric bypass at an outside hospital. She had a complicated post-operative course, which included intussusception requiring diagnostic laparoscopy and lysis of adhesions. She subsequently developed oral intolerance due to post-prandial abdominal pain, and had an unintentional 160 pound weight loss (BMI18). As a result, a G-tube was placed into her gastric remnant for nutrition. Symptoms of regurgitation and drainage of food from the G-tube were concerning for gastro-gastric fistula, although none was visualized on upper GI barium swallow. A pre-operative upper endoscopy demonstrated a marginal ulcer at the GJ anastomosis. The patient underwent laparoscopic revision of her Roux-en-Y gastric bypass, revising her gastrojejunal anastomosis by resection of the distal gastric pouch and initial portion of the jejunum to remove the marginal ulcer. Given the extensive mobilization ICG fluoroscopy was used to assess perfusion intraoperatively.

The patient did well post-operatively and reported resolution of her post-prandial abdominal pain, along with a 7 pound weight regain to BMI 21.

## A254

### **It's not you, it's me: Ecological momentary assessment using mobile technology shows affect improves and perceived control of weight shifts away from other people and towards the patient after bariatric surgery**

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Brown University & The Miriam Hospital<sup>1</sup> Beth Israel Deaconess Medical Center<sup>2</sup>

**Background:** Patients often expect that bariatric surgery will improve their day-to-day emotional experience and perceived control of their weight. However, few studies have evaluated these changes, and none have examined them in near real-time using ecological momentary assessment (EMA).

**Methods:** Patients (N=72) who underwent Roux-en-Y gastric bypass or sleeve gastrectomy used smartphones to rate (scale of 1[lowest]-5[highest]) locus of control of weight in 4 domains (self, doctors, chance/luck, other people) once daily, and affect and social support at 4 semi-random times daily, for 10 days pre, 3-, and 6-months postoperatively.

**Results:** Participants (age=44.38±11.22 years; 90% female; preoperative BMI=47.3±12.3 kg/m<sup>2</sup>) completed 8879 EMA ratings, analyzed via generalized linear mixed models. From pre- to post-



operative time points, improvements were observed in momentary ratings of feeling happy (baseline mean $\pm$ SE=3.68 $\pm$ .08; coefficient of change=.09, p=.031), nervous (baseline=1.47 $\pm$ .08; coefficient of change=-.14, p=.008), and energetic (baseline=2.98 $\pm$ .09; coefficient of change=.12, p=.009), but not determined (baseline=3.82 $\pm$ .10), attentive (baseline=3.67 $\pm$ .10), afraid (baseline=1.33 $\pm$ .07), upset (baseline=1.37 $\pm$ .06), or alert (baseline=3.52 $\pm$ .09) (p's>.05). Locus of control of weight shifted more towards the self (baseline=4.6 $\pm$ .07; coefficient of change=.05, p=.035) and away from other people (baseline=1.90 $\pm$ .11; coefficient of change=-.14, p=.001); no change (p's>.05) in doctor (baseline=3.82 $\pm$ .10) or chance/luck (baseline=4.4 $\pm$ .09). Ratings of social support were moderately high and did not change (baseline=3.97 $\pm$ .12, p>.05).

**Conclusions:** This study is the first to show that bariatric surgery improved certain real-time indicators of daily emotional experience, and patients reported their weight felt more under their control and less susceptible to social influences. These changes may contribute to improved health and quality of life.

## A255

### **Short-term Efficacy of Laparoscopic Sleeve Gastrectomy(LSG) for Severe Obstructive Sleep Apnea(OA) in Chinese Obesity Patients**

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**Background:** The prevalence of obesity is increasing in China, which is associated with obstructive sleep-disorder breathing.

**Methods:** We performed a retrospective study using the clinical data of 151 consecutive subjects (from 271 patients) with obesity and severe OSA who underwent LSG from January 2015 to October 2017. All the subjects underwent polysomnography (PSG) before and 12 months after LSG.

**Results:** 151 Chinese obesity patients with severe OSA were included in the study (71 males, 80 females), with a mean age of 31 $\pm$ 8.7 years (ranging from 22 to 55 years). 94.0% of the patients (142/151) were cured or achieved improvement of OSA, while the other 9 patients did not achieve any improvement of OSA. Significant weight loss and improvement of OSA were observed (p<0.001) as compared with the baseline data. The mean apnea hypopnea index (AHI) reduced notably from 55.4 /h (95% CI, 35-75.8) to 12.2 /h (95% CI, 7.4-21.2) after surgery, while the mean change of BMI was -11.8 kg/m<sup>2</sup> (95 % CI, -9.0 to -14.1) . In addition, there was no statistically significant correlation (p>0.05) between weight loss and the improvement of OSA, while postoperative AHI was correlated significantly with preoperative AHI (p=0.003).

**Conclusion:** Our single-center retrospective study demonstrates LSG could be an effective therapeutic strategy for severe OSA in Chinese morbidly obese patients, and preoperative AHI may can be an important predictive factor for the efficacy of LSG for OSA, which warrants a

long-term follow-up study.

## **A256**

### **The Influence of Health Literacy and Health Numeracy on Weight Loss Outcomes Following Bariatric Surgery**

Lisa Miller-Matero *Detroit MI*<sup>1</sup>, Leah Hecht *Detroit MI*<sup>1</sup>, Kellie Martens *DETROIT MI*<sup>1</sup>, Aaron Hamann *Detroit MI*<sup>1</sup>, Arthur Carlin *Detroit MI*<sup>1</sup>  
Henry Ford Health System<sup>1</sup>

Guidelines for pre-surgical psychosocial evaluations for bariatric surgery recommend that evaluators understand patients' cognitive abilities. However, existing research has focused on global cognitive functioning. The purpose of this study was to examine whether health literacy and health numeracy influence weight loss outcomes.

Patients (N=527) who underwent bariatric surgery from 2014-2017 completed a survey reporting current weight in March-April 2018. Pre-surgical weight/BMI and levels of health literacy (REALM) and health numeracy (Brief Medical Numbers Test) were collected from the pre-surgical psychosocial evaluation. Participants were categorized in the weight loss period (<2 years post-surgery) or weight maintenance period (2-4 years post-surgery). Weight loss outcomes included change in BMI ( $\Delta$ BMI), percent total weight loss (%TWL), and percent excess weight loss (%EWL).

Participants were predominantly female (83.3%), middle-aged (M=45.5 years), and Caucasian (62.3%) or African American (36.0%), with an average pre-surgical BMI of 48.06. For participants in the weight loss period, there were no significant relationships between weight loss outcomes and health literacy or health numeracy ( $p>.05$ ). However, for participants in the weight maintenance period, better health numeracy was related to greater  $\Delta$ BMI ( $p=.01$ ), %TWL ( $p=.01$ ), and %EWL ( $p=.047$ ). Additionally, there was a trend suggesting those with better health literacy had greater %EWL ( $p=.07$ ).

Findings suggest that patients with lower health literacy and numeracy may be less likely to maintain weight loss following bariatric surgery. Clinicians conducting pre-surgical psychosocial evaluations could consider assessing health literacy and health numeracy. Patients with low health numeracy may benefit from additional support, especially during the weight maintenance period.

## **A257**

### **Associations between physical activity and change in weight, depressive symptoms, and health-related quality of life following Roux-en-Y gastric bypass surgery: a multicenter prospective cohort study**

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University of Pittsburgh Graduate School of Public Health<sup>1</sup> University of Pittsburgh Graduate School of Public Health<sup>2</sup> University of Pittsburgh Medical School<sup>3</sup>

**Background:** There is sparse research relating objectively-measured physical activity to long-term outcomes of bariatric surgery.

**Methods:** 649 participants (78% female, median body mass index 46 kg/m<sup>2</sup>) of a multi-center cohort study completed research assessments pre-surgery and annually post-Roux-en-Y gastric bypass (RYGB) for up to 7 years. Measures included an activity monitor, weight, Beck Depression Inventory (BDI), and Short-Form-36 Health Survey (SF-36). Mixed models were used to test associations of quartiles of time engaged in moderate-to-vigorous-intensity physical activity (MVPA) and sedentary behavior (SB) with changes in weight, depressive symptoms and mental and physical health-related quality of life over 7 years, independent of demographics, eating behaviors, and health status.

**Results:** There was a dose-response association between SB for all outcomes. Those with the lowest versus highest quartiles of SB averaged 2.2% more weight loss as a percentage of pre-surgery weight (p=0.004), 5.2% lower percent of maximum weight lost regained (p=0.01), and better pre- to post-surgery improvements in the BDI depressive symptom score (1.4 points; p=0.02), SF-36 mental score (2.4 points; p=0.04), and SF-36 physical score (1.0 point; p=0.04). MVPA was also independently related to improvements in SF-36 mental and physical scores (highest versus lowest quartile: 1.8 (p=.04) and 3.0 (p<.001) points, respectively), but not weight loss (p=.19) weight gain (p=.99) or depressive symptoms (p=.22) (adjusting for SB).

**Conclusion:** Among a large cohort of adults with severe obesity who underwent RYGB, free-living (non-intervention related) physical activity, in particular, SB, was independently associated with modest long-term improvements in weight, mental health and physical health.

## A258

### **PREDICTING CARDIAC COMPLICATIONS AFTER BARIATRIC SURGERY: MBSAQIP VALIDATION OF THE MICA SCORE**

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Temple University Hospital<sup>1</sup> Temple University<sup>2</sup> Mayo Clinic<sup>3</sup>

**Introduction:** The Gupta Perioperative Risk for Myocardial Infarction or Cardiac Arrest (MICA) scale is a common metric for evaluating which patients are at risk of perioperative cardiac complications. However, this score has not been externally validated in the bariatric population. The MBSAQIP database, the largest bariatric-specific clinical dataset, is an ideal tool for validating the predictive power of the MICA scale in this complex population.

**Methods:** From the 2015-2017 MBSAQIP database, the MICA scores of all patients undergoing metabolic and bariatric surgery were calculated. The discriminative ability and diagnostic accuracy of the MICA score in predicting cardiac morbidity was calculated.

**Results:** A total of 474,194 patients were included in this validation cohort. The MICA scale had a fair discriminative ability between low (<0.5% risk of cardiac complications), medium (0.5–1.0%), and high (>1.0%) risk patients, with complication rates of 0.083%, 0.434%, and 1.092%,

respectively. On ROC analysis, the scale was found to have an area under the curve (c-statistic) of 0.752. While this denotes fair accuracy, it is significantly less so than other previously reported cohorts (0.874–0.884.)

**Conclusions:** While the MICA scale demonstrates moderate accuracy, validation in this external dataset shows the scale to be significantly less accurate than previously described. The MICA scale remains a valuable tool for assessing cardiac risk in bariatric patients; however, reliance on this scale alone may be insufficient to accurately predict the likelihood of cardiac complications. Findings should be supplemented with further diagnostic efforts in the setting of clinical suspicion for cardiac disease.

## A259

### **Discrimination and Correlates among Spanish- and/or English-Speaking Latinx Adults Seeking Bariatric Surgery**

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Latinx groups are characterized by substantial disparities in obesity and associated comorbidities and often experience ethnic/racial discrimination. Relevant studies with Latinx patients seeking bariatric surgery are scarce. This study examined the relationships between ethnic/racial discrimination and body mass index (BMI), psychosocial functioning, and attendance at doctors' appointments among Latinx adults seeking bariatric surgery. Participants were 260 adults (36.5% primarily Spanish-speaking) seeking bariatric surgery who identified as Latinx/Hispanic. Mean (*SD*) age and BMI were 34.9 (10.7) years and 43.6 (6.7) kg/m<sup>2</sup>, respectively. Participants completed a battery of established self-report measures (in preferred language) on experiences of and responses to ethnic/racial discrimination, mental and physical functioning, depression, loss-of-control (LOC) eating, and likelihood of attending doctors' appointments. Ethnic/racial discrimination was associated significantly with poorer mental functioning, higher depression levels, greater severity of LOC eating, and less likelihood of attending scheduled doctors' appointments, but not with BMI or physical functioning. A more active response to discrimination was associated significantly with better mental functioning, lower depression levels, and less severity of LOC eating, but not with BMI, physical functioning, or attendance at doctors' appointments. Among Latinx adults seeking bariatric surgery, ethnic/racial discrimination is associated with broad levels of psychosocial impairment and greater likelihood of missed doctors' appointments. Active responses to perceived unfair treatment may serve as a buffer against discriminatory experiences. Bariatric teams should be aware of the negative sequelae associated with ethnic/racial discrimination, be prepared to address clinical needs, and work to structurally eliminate the potential for such experiences in their settings.

## A260

### **An Interdisciplinary Team Approach for Bariatric Surgery Candidate Selection: 5-Year Outcomes**

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#### Introduction

Best practice advises a multi-disciplinary approach for evaluation of bariatric surgery candidates to optimize suitability. Few studies have addressed team evaluation processes. Standardized guidelines are lacking. This study describes the characteristics and final outcomes of high risk candidates.

#### Methods

A retrospective record review was conducted on candidates identified as high risk and reviewed by the interdisciplinary team from August 2012 through December 2017. The high risk designation was based on results of pre-surgery psychological, dietetic, surgical, medical, social/behavioral assessments and staff observations. A descriptive data analysis resulted in risk indicator and outcome categories.

#### Results

A total of 531 patients (76.8% female) were identified, having one or more risk indicators (see Table). After prescribed interventions, outcomes included: surgery 136(25.6%), not a candidate 162(30.5%), left program-no contact 193(36.3%), and reported stopping the work-up 33(6.2%). Additionally 7 (1.3%) post-surgery patients were reviewed. Patients who proceeded to surgery had less psychological (6.8%) and more dietetic (6.1%) risk indicators than the total group. %TWL at 1 year (n=62) and 2 years (n=14) were 23±11.8 and 15.1±14, respectively, outcomes comparable to those seen in non-IDT sleeve gastrectomy patients at our center (see Figure).

#### Discussion

The interdisciplinary approach of high risk candidate review supported safe surgery for 136 patients who might otherwise not been offered surgery. This process identified a subset as unstable to safely proceed to surgery. The ongoing identification of risk indicators, interventions, and monitoring outcomes informs process improvements for the program.

## A261

## **Examining Emotion-, Personality-, and Reward-Related Dispositional Tendencies in Relation to Eating Pathology and Weight Change Over Seven Years in the Longitudinal Assessment of Bariatric Surgery (LABS) Study**

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This study examined dispositional emotion-, personality/temperament-, and reward-related variables in relation to post-surgery eating pathology and weight change from surgery over seven years following bariatric surgery. The sample included 107 adults who underwent Roux-en-Y gastric bypass (RYGB) or laparoscopic adjustable gastric banding (LAGB). Annual post-surgical assessments were conducted to evaluate eating pathology, using the Eating Disorder Examination-Bariatric Surgery Version, and percent weight change from pre-surgery. Dispositional measures were administered at the 6- or 7-year assessment and included the Affect Intensity Measure, the Difficulties in Emotion Regulation Scale, the UPPS-P Impulsive Behavior Scale, the Effortful Control Scale of the Adult Temperament Questionnaire, and the Sensitivity to Punishment/Sensitivity to Reward Questionnaire. Results from a series of linear mixed models revealed significant associations of emotion dysregulation, affect intensity, positive and negative urgency, reward sensitivity, and effortful control (inverse association) with eating pathology severity across 7 years; all but two of the subscales comprising the overall scores were also significantly associated. Results were less consistent with regard to weight change; overall emotion dysregulation and overall affect intensity (along with several subscales) were significantly associated with percent weight change (i.e., less weight loss), but the negative and positive urgency, effortful control, and reward sensitivity variables did not emerge as significantly associated. The pattern of associations across the two outcomes did not differ by surgical procedure. These findings suggest that certain dispositional tendencies may relate to suboptimal long-term outcomes following bariatric surgery and thus may be important to assess in pre-surgical or early post-surgical evaluations.

## **A262**

### **Negative Affect and Loss of Control Eating among Bariatric Surgery Patients: A Preliminary Ecological Momentary Assessment Investigation**

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Evidence suggests that loss of control (LOC) eating impacts weight loss outcomes following bariatric surgery; however, mechanisms explaining the development and/or maintenance of LOC remain unclear. Research utilizing ecological momentary assessment (EMA) has demonstrated prospective relationships between negative affect (NA) and LOC within the eating disorder literature, but this effect has not been examined within a bariatric surgery population using momentary data. This study explored whether higher NA led to greater LOC among bariatric

surgery patients and if the relationship differed before versus after surgery. Fourteen pre- and 17 post-RYGB patients completed two weeks of EMA signaling. Participants responded to seven signals each day and rated their current mood and experience of LOC since the last signal. Results from a Generalized Linear (GEE) model demonstrated that higher NA predicted higher ratings of LOC at the next signal ( $B = .223, \chi^2(1) = 58.87, p < .001$ ) and that group had a moderating effect ( $B = -.163, \chi^2(1) = 15.19, p < .001$ ), wherein the post-surgery had a stronger association between NA and LOC relative to the pre-surgery group. Post-hoc analyses among the post-surgery group demonstrated that body mass index (BMI) change, percent excess BMI loss, and percent total body weight loss moderated the relationship between NA and LOC ( $p$ 's  $< .05$ ), such that the relationship between NA and LOC was stronger for those who had experienced less weight loss. These preliminary findings implicate NA as a possible target for improving weight loss outcomes. Limitations and future directions will be discussed.

## A263

### Language Matters: Patients' Preferred Terms for Discussing Obesity and Binge Eating with Health Care Providers After Bariatric Surgery

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**Background:** Patients who seek or undergo bariatric surgery are likely to experience pervasive societal biases surrounding weight (e.g., “anti-fat” stigma) and overeating behaviors, including binge-eating. A recent study supported the use of person-first obesity language among individuals seeking bariatric surgery; for example, patients were more likely to prefer “person with obesity” compared to “obese person.” Little is known about patient preferences for most acceptable terminology to discuss weight and binge-eating behaviors. This study surveyed a series of patients who had undergone bariatric surgery to indicate the desirability of different weight and binge-eating terms when speaking with health-care providers. **Method:** Participants were 168 adults (82.7% female) who underwent bariatric surgery approximately 1.5-2 years prior and were in the follow-up stage of a controlled treatment trial testing behavioral treatments. **Results:** Of the 11 terms used to describe weight, only two were viewed positively: *weight* and *BMI*. All other terms, including *obesity*, were rated negatively and many were rated extremely negatively. *Fatness* was the least desirable term. Of the 18 terms used to describe binge-eating, six were rated positively. On average, none of the weight or binge-eating terms was rated as “desirable” or “very desirable.” Analyses revealed several gender and racial differences in preferences for terminology. **Conclusions:** Our findings suggest that many weight-related and binge-eating terms are viewed as undesirable. Health-care providers should replace undesirable terms with positive or neutral terms about weight and binge-eating when speaking with individuals before/after bariatric surgery as this may improve patient-centered care and reduce perceived weight bias.

## A264

## **The impact of childhood trauma on pre-surgery status and outcomes of bariatric surgery: a literature review.**

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Graduate School of Public Health, Unive

**Background:** History of childhood trauma (CT), which is over-represented among bariatric surgery candidates, is associated with increased risk of mental disorders, eating pathology and obesity.

**Method:** A literature review was conducted to evaluate CT in relation to pre-surgery status and outcomes of bariatric surgery.

**Results:** Four studies (sample size range: 230-567) have reported significant associations between CT and lifetime history of psychiatric disorders/conditions and treatment (including mood, anxiety, binge eating and substance use disorders, emotional difficulties, depressive symptoms, suicidal ideation and antidepressant use) among pre-surgery patients. When evaluated by sex and by CT type (i.e., emotional, physical and sexual abuse, and emotional and physical neglect), associations differed. Severity of childhood emotional and physical abuse/neglect also differentiated outcomes; this was not true for sexual abuse. Six studies (sample size range: 96-424, follow-up  $\leq 2$  years in 4 of 6) have reported lack of significant associations between measures of CT (most often sexual abuse) and either post-surgery weight/BMI, weight loss and/or weight regain. Three of these studies, however, found significant associations with post-surgery depression or less improvement in depressive symptoms. Finally one study found no association with post-surgery eating disorders but another study reported significant associations with less improvement in eating pathology.

**Conclusions:** It does not appear that CT, childhood sexual abuse in particular, is related to surgery-induced weight outcomes. However, CT may result in less improvement in depressive symptomatology and eating pathology. Research with larger samples is needed to clarify differences in associations for males vs. females and by type/severity of CT.

## **A265**

### **Project HELP: A Randomized Controlled Trial Evaluating the Effect of a Remotely-Delivered Acceptance-Based Behavioral Intervention for Reducing Postoperative Weight Regain**

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Weight regain following bariatric surgery is largely attributed to reduced adherence to postoperative diet recommendations. As time from surgery increases, patients can experience internal states that make adhering to these recommendations difficult (e.g., return of hunger and food cravings). Acceptance-based behavioral treatments (ABTs) provide patients with skills to increase engagement in value-directed behavior (e.g., healthy eating), despite negative internal states. We previously developed a 10-week remotely-delivered ABT (ABTi) and preliminary results indicated high acceptability and preliminary efficacy in a small open trial (n=16). The goal of the current study was to further evaluate the effectiveness of this intervention. We



randomized 71 participants to receive ABTi or to a waitlist control (WLC) condition. Following the 10-week intervention, participants assigned to ABTi demonstrated significantly greater percent total body weight loss compared to WLC (loss of .8% ± 2.8% vs. gain of .3% ± 1.8%,  $t(69)=2.1, p = .03$ ). However, the mean weight loss achieved did not reach current standards of clinical significance. When clinically significant weight loss was operationalized as at least 3%, a significantly greater percentage of participants who received ABTi met this criteria compared to WLC (24.3% vs. 2.9%,  $\chi^2(1)=6.7, p = .01$ ). Encouragingly, participants in ABTi reported significantly greater reductions in average daily caloric intake (-602 kcal vs. +15 kcal,  $F(1)=5.4, p = .02$ ) and maladaptive eating behaviors (including binge eating and grazing) compared to WLC. These data further support the potential utility of ABTi after bariatric surgery, though future research is needed to enhance its effects.

**A266**

**DSM 5 Lifetime Psychiatric Diagnosis in 2 Bariatric Surgery Sites**

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Patients presenting for bariatric surgery are a psychiatrically vulnerable population. Previous studies have examined the prevalence of psychiatric disorders utilizing structured interviews based upon the DSM-IV. The current study examined whether similar lifetime prevalence would be shown using the DSM-5.

Participants (N=113) were evaluated as part of a longitudinal study examining post-operative weight loss outcomes. Two study sites (Cleveland and Fargo) were utilized.

Mean age of participants was 41.7 years (SD=10.2). 81.4% of the sample self-identified their gender as women. 76.1% of participants were Caucasian, 19.5% were African-American, 2.7% were more than one race and 1.8% were Latino. Participants were administered the Structured Clinical Interview for DSM-5 (SCID5) in the month preceding surgery by a licensed clinical psychologist or trained research assistant.

The Table below shows the lifetime prevalence estimates of the current study using the SCID5 in comparison to the range and mean of 3 US studies using the Structured Interview for the DSM-IV.

<b>Diagnosis</b>	<b>DSM-5 %</b>	<b>Mean DSM-IV %</b>	<b>Range</b>
Any Psychiatric Disorder	49.0	57.2	36.8 - 68.6
Any Mood Disorder	40.2	37.4	22.4 - 45.5
Major Depression	30.5	31.9	4.9 - 42.0
Alcohol Use Disorder	14.5	26.0	4.0 – 40.7
Any Anxiety Disorder	13.0	28.2	15.5 – 37.5
Post-Traumatic Stress Disorder	11.3	11.5	11.1 – 11.8
Any Eating Disorder	7.6	19.6	13.1 – 29.5

Overall, prevalence was similar or lower than prior studies. Changes to diagnostic criteria may explain differences although future studies across other sites are needed to better understand the

population.

## A267

### **Neuroimaging Lessons in Bariatric Surgery**

Paul Davidson *Boston MA*

Brigham and Women's Hospital

This presentation will summarize some of the key literature on neurological mechanisms and changes seen with bariatric surgery. In addition to the general literature, the talk will offer insights from an fMRI study we conducted related to sleeve gastrectomy. Using 18 sleeve candidates, fMRI was completed prior to surgery and then again one year following the procedure. Baseline activity in the NAcc and hypothalamus during desire for palatable food enhancement was significantly predictive of %TWL at 12 months (P (FWE)<0.05), superior to behavioral and hormone predictors, which did not significantly predict %TWL (P>0.10). Using stepwise linear regression, left NAcc activity accounted for 54% of the explained variance in %TWL at 12 months. Conclusions: Consistent with previous obesity studies, reward-related neural circuit activity may serve as an objective, relatively robust predictor of postsurgery weight loss. We now have follow-up analysis as well demonstrating that resting state functional connectivity in these patients is similarly predictive of post-surgical results.

## A268

### **Psychotropic medication use and weight outcomes 1-year post bariatric surgery**

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Centre for Addiction and Mental Health,<sup>1</sup> University of Toronto<sup>2</sup> UHN, University of Toronto<sup>3</sup> Toronto Western Hospital, UHN<sup>4</sup> Ryerson University<sup>5</sup>

**Objective:** Given the high rates of psychiatric comorbidity in bariatric surgery patients, pharmacotherapy is common and could potentially influence weight loss outcomes. Approximately 40% of bariatric surgery candidates are prescribed psychiatric medication with antidepressants being the most common medication. In this study, we aimed to identify the impact of psychotropic medication use on percent total weight loss (%TWL) one year after bariatric surgery.

**Methods:** In this prospective cohort study, 190 patients were compared based on demographic variables (age, sex, relationship status, employment status), body mass index (BMI), %TWL, and

psychotropic medication use pre- and 1-year post-bariatric surgery. ANOVA test was used as global test of significance for psychotropic medication comparisons related to %TWL. Significance of post hoc comparisons were calculated with the Tukey's Honestly Significant Difference test.

**Results:** 32.1% (61/190) of patients were taking psychiatric medications pre-surgery; of those, 82% (50/61) continued to take psychiatric medications 1-year post-surgery. %TWL did not significantly differ between patients taking no psychiatric medications, one medication, or more than one medication 1-year post-surgery (31.4% vs 29.9% vs 34.4%, respectively). Among patients taking antidepressants, those taking Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs)[SC1] had a significantly higher %TWL compared to those taking Selective Serotonin Reuptake Inhibitors (SSRIs[SC2] ) (36.4% vs 27.8%;  $t(30) = -2.677, p = 0.012$ ).

**Conclusion:** This longitudinal study suggests that general psychiatric medication use was not associated with poorer %TWL at 1-year post-bariatric surgery. Within class antidepressant use may have differential effects on weight loss after bariatric surgery and warrants further investigation.

## A269

### **Interpersonal Contact and Weight Bias throughout Medical Training: Testing a Hypothesized Model from the Cognitive Habits and Growth Evaluation Study (CHANGES)**

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Gundersen Health System<sup>1</sup> Gundersen Medical Foundation<sup>2</sup> Mayo Clinic<sup>3</sup> Oregon Health & Sciences University<sup>4</sup>

*Background:* Weight bias is pervasive among healthcare providers/trainees. Positive interpersonal contact can reduce weight biases. The objective of this study was to test a model of the relationships among quantity and favorability of contact, implicit and explicit weight bias, perceived skill in weight loss counseling, and demographics among medical trainees longitudinally.

*Methods:* A cohort of 2370 trainees completed web-based surveys at years 1 and 4 of medical school and again after their 2nd year of residency. Structural equation modeling was used to test the fit of a hypothesized model of contact, weight bias, and perceived skill, over the course of medical training.

*Results:* Model fit was adequate;  $\chi^2(70, N = 1432) = 614.99, p < .001, CFI = 0.93, SRMR = 0.08$ ; Figure). At year 1, quantity and favorability of interactions were inversely correlated with explicit weight bias; each year positively predicted subsequent year implicit and explicit bias levels. Favorability of contact mediated the change in explicit bias over time, and mediated change in implicit bias only from year 1-4. BMI was related to explicit weight at baseline but did not moderate the relationship between contact and weight bias over time. Similarly, race and

gender did not moderate these relationships.

*Conclusions:* Results support a relationship between quantity and favorability of contact, implicit and explicit weight bias, perceived skill in weight loss counseling, and demographics among medical trainees longitudinally. Increasing frequent, positive contact with obese individuals may result in less weight bias for medical providers over time.

## **A270**

### **Validation of the Yale Food Addiction Scale 2.0 in Bariatric Surgery-Seeking Patients**

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Gundersen Health System<sup>1</sup> Mayo Clinic<sup>2</sup> University of Michigan<sup>3</sup>

*Background:* The Yale Food Addiction Scale (YFAS) was developed in 2009 to assess food addiction; a revised version was released in 2016 (YFAS 2.0). Little research has examined food addiction in a bariatric surgery population specifically. The objective of this study was to validate the YFAS 2.0 in a sample of adults seeking bariatric surgery.

*Methods:* This multi-center study included patients who underwent a preoperative psychological evaluation during 2015-2018. Only those who completed the YFAS 2.0 were included. Responses to the YFAS 2.0 were validated against the PHQ-9, GAD-7, MDQ, ACES, AUDIT, WEL-SF, and EOQ. Statistical analysis included chi-square tests and Spearman Correlations.

*Results:* Overall, 1208 patients were included; 74% female. Mean age and BMI were  $47.2 \pm 12.7$  years and  $46.9 \pm 12.9$  kg/m<sup>2</sup>, respectively. There were 195 (16%) patients who screened positive on the YFAS 2.0 (21% mild, 24% moderate, and 56% severe food addiction). More women screened positively on the YFAS 2.0 compared to men (18% vs. 12%;  $P < 0.01$ ). Of patients who screened positive on the YFAS 2.0, 15% also met criteria for binge eating disorder. Mean scores for the PHQ-9, GAD-7, MDQ, ACES, and EOQ were highest among those who screened positive for food addiction (Table).

*Conclusions:* The YFAS 2.0 was significantly correlated with total scores for the PHQ-9, GAD-7, MDQ, ACES, WEL-SF, and EOQ. Consistent with previous literature, the YFAS 2.0 did not correlate with patient BMI or AUDIT. The YFAS 2.0 is a valid measure to assess food addiction in patients pursuing bariatric surgery.

## **A271**

### **Behavioral and Psychosocial Predictors of Adherence to Dietary Recommendations One-year post-bariatric Surgery**

Susan Wnuk *Toronto*<sup>1</sup>, Batool Azim *TORONTO*<sup>1</sup>, University Network *Toronto*<sup>1</sup>, Sanjeev Sockalingam *Toronto*<sup>1</sup>  
University Health Network<sup>1</sup>

## Background

Adherence to dietary guidelines is critical for optimizing the health and weight outcomes of bariatric surgery patients, yet many patients struggle to adhere to these guidelines.

## Objectives

To evaluate the types and frequency of problematic dietary behaviors one-year post-surgery and to examine pre-surgery predictors of adherence to dietary recommendation at one-year post-surgery.

## Setting

University Hospital, Canada

## Methods

We completed a prospective cohort study of adult patients who underwent sleeve gastrectomy (n=25) or Roux-en-Y gastric bypass (n=323) between 2013 and 2017. Pre and post-surgery parameters included demographics, problematic pre and post-surgery dietary behaviors as assessed by dietitians in clinical interviews, and mental health symptoms as measured by self-report questionnaires.

## Results

Pre-surgery, 264 (75.9%) participants were classified as low risk in terms of eating behavior. At one-year post-surgery, 145 (41.7%) were not adherent to dietary guidelines. The three most frequent problematic eating behaviors were insufficient protein intake (32.4%), inadequate vitamin intake (26.1%) and grazing (21.1%). Significant predictors of post-surgery dietary adherence were pre-surgery dietitian disposition ( $\beta=0.68$ , 95% [1.06, 3.69],  $p = 0.03$ ), perceived social support ( $\beta=0.01$ , 95% [1.00, 1.03],  $p = 0.05$ ) and gender ( $\beta=0.69$ , 95% [0.10, 3.98],  $p = 0.05$ ), with women being more likely to be adherent.

## Conclusions

Various problematic eating behaviors were identified as common across patients. Pre-surgery dietitian disposition was a predictor of adherence to dietary guidelines as were better perceived social support and female gender.

## A272

### **Beyond A Single Identity: Using an Intersectional Approach to Improve Equity in Access and Outcomes in Bariatric Surgery**

Allyson Diggins *Cleveland OH*<sup>1</sup>, Allison Holgerson *Gainesville FL*<sup>2</sup>, Karen Stewart *Nashville TN*<sup>3</sup>, Ninoska Peterson *Cleveland OH*<sup>1</sup>

Cleveland Clinic<sup>1</sup> University of Florida<sup>2</sup> Vanderbilt University Medical Center<sup>3</sup>

Epidemiological studies consistently note that the populations most affected by obesity not only have less access to treatment but also have poorer responses to standard treatment modalities. In

particular, varying outcomes within bariatric surgery are seen among patients of different race/ethnicities, genders, and socioeconomic status. Drawing on intersectionality theory, this panel discussion will include an overview of how systems of inequality shape access to and benefit from bariatric surgical procedures. Through a series of case studies, the audience will consider the importance of moving beyond the use of single, distinct factors or an additive approach (e.g., gender + socioeconomic status + race/ethnicity) to provide a more complete understanding of differential access and outcomes in bariatric surgery. We hope to provide clinicians with practical strategies for examining the multi-level influence of interacting social identities and ways to use an intersectional approach to inform the development and delivery of behavioral interventions for patients presenting for bariatric surgery. Three case studies will highlight intersections between race/ethnicity, gender, sexual orientation, socioeconomic status, physical disability, and geographical location.

- Allyson Diggins, Ph.D. (Cleveland Clinic): Describe intersectionality and its role in surgical treatment for obesity
- Allison Holgerson, Ph.D. (University of Florida): Case Example #1
- Karen Stewart, Ph.D. (Vanderbilt University): Case Example #2
- Ninoska Peterson, Ph.D. (Cleveland Clinic): Case Example #3

## A273

### **Internalized Weight Bias and Experienced Weight Stigma in a Medical Weight Loss Patient Sample**

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Hartford Hospital/Institute of Living<sup>1</sup> Hartford Hospital<sup>2</sup> University of Connecticut<sup>3</sup>

**Background:** Previous research in behavioral and surgical weight loss suggests patients with higher internalized weight bias (IWB) and experienced weight stigma (EWS) are at-risk for negative outcomes, including unhealthy eating behaviors, depression, and weight loss difficulties. However, no studies have examined IWB or EWS in medical weight loss (MWL) programs, which combine behavioral and pharmacological interventions.

**Methods:** New patients (n = 71) in a MWL program were assessed with the Weight Bias Internalization Scale Modified (WBIS-M), Weight Self-Stigma Questionnaire (WSSQ), and a survey of EWS history. Sociodemographic, medical, and psychological correlates of IWB and EWS were assessed.

**Results:** Participants (age = 48.1 years; 50.7% Caucasian; BMI = 41.7 kg/m<sup>2</sup>) were predominantly female (78.9%) with no bariatric surgery history (69%). Two-thirds (66%) reported experiencing at least one type of weight stigma (teasing = 63.4%; unfair treatment = 42.3%; discrimination = 32.4%), with the highest rates occurring during adolescence/young adulthood. Greater IWB was associated with younger age ( $r(68)=-.38, p < .01$ ), male sex ( $t(37.1)=2.41, p < .05$ ), higher BMI ( $r(69)=.32, p < .01$ ), and higher PHQ-9 score ( $r(68)=.31, p < .05$ ). Higher incidence of EWS was associated with higher PHQ-9 score ( $r(69)=.28, p < .05$ ) and

bariatric surgery history ( $t(67)=-2.12, p < .05$ ).

**Conclusion:** Participants who were younger, male, with higher BMI, and more depressive symptomatology reported higher internalized weight bias, while those with bariatric surgery history and higher depressive symptomatology endorsed greater experienced weight stigma. Future analyses will assess the relationship between these constructs and weight loss outcomes over time.

#### A274

##### **Is initial psychological clearance status related to weight loss outcomes in patients seeking bariatric surgery?**

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West Virginia University<sup>1</sup>

**Background:** West Virginia University Metabolic and Weight Loss Surgery Program requires that potential patients who demonstrate psychosocial distress (e.g., a diagnosable psychiatric disorder) complete an intervention before being cleared for bariatric surgery. This study compares 6- and 12-month weight loss in this group and those who did not require an intervention.

**Methods:** Bariatric surgery patients were cleared for surgery and follow-up data were collected at 6- (n=172) and 12-months (n=132), post-surgery. Descriptive statistics were derived and a generalized linear model (GLM) tested the associations between initial clearance status (intervention/no intervention) and percent excess BMI loss (%EBMIL) at 6-months controlling for age, sex, race, the clinician conducting the evaluation, and surgery type (sleeve gastrectomy [SG]/Roux-en-Y gastric bypass). A separate model tested the association between clearance status and %EBMIL at 12-months and included the same covariates.

**Results:** Patients with 6-months post-surgical weight data were white (97.7%), mostly female (77.9%), and middle-aged ( $M=43.88, SD=18.67$ ) and had a mean pre-surgical BMI of 44.07 ( $SD=5.58$ ). Most patients received initial surgery clearance (69.2%), SG (62.2%), and the %EBMIL was 41.95% ( $SD=18.66$ ). The 12-month sample was sociodemographically and clinically similar; the %EBMIL was 50.54 ( $SD=24.98$ ). GLMs showed that those who required an intervention had a lower %EBMIL at 6- and 12-months, but the differences were not significant (6-month adjusted means: 38.83% vs. 43.35%,  $p=0.10$ ; 12-month adjusted means: 48.46% vs. 51.48%,  $p=0.46$ ).

**Conclusions:** In general, at 6- and 12-months post-surgery, all patients lost weight and clearance status was not a significant predictor of weight loss success.

#### A275

## **Weight Loss Surgery Post-Op Day 1: Inpatient Behavioral Health Assessment & Intervention**

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McLaren Flint<sup>1</sup>

While the behavioral health team is often involved in the pre-surgical bariatric surgery process, the empirical literature to date has done little to address the potential role of the behavioral health team post-operatively. A 2018 article by Pearl, Allison, Tronieri, and Wadden suggested that patients may greatly benefit from post-operative engagement with behavioral health providers to address new or persistent barriers to success. Further, the post-operative engagement of psychologists can allow systematic issues that impact patients throughout the recovery process to be identified and assessed via needs assessments and quality improvement projects. At an urban bariatric and metabolic institute affiliated with a 378-bed medical center, a doctoral-level health psychologist, whose primary responsibilities include: completion of pre-surgical assessments, individual therapy, and facilitation of pre and post-operative group-based interventions, is embedded within the clinic. Yet, still a gap in behavioral health care was identified during the time between surgery date and initial follow-up appointment as patients struggled to adjust to the effects of surgery, the magnitude of the lifestyle changes required, and the interference of mental health symptoms with acute recovery. To address this gap, as of January 2018, the primary psychologist completes an inpatient assessment and brief intervention, as appropriate, for each patient one day post-operatively. Overall, patients and staff have been highly receptive to this process, and medical errors have been reduced. Further details regarding the process of developing this form of billable behavioral health rounding within a health care system will also be addressed.

### **A276**

#### **Trends in revisional bariatric surgery: an analysis of the MBSAQIP database 2015-2017.**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Introduction:** The third most common bariatric surgery is revisional bariatric surgery. The American College of Surgeons tracks outcomes using the Metabolic and Bariatric Surgery Accreditation Quality Initiative Program (MBSAQIP) database. We used this database to examine trends in revisional bariatric surgery (RBS). We asked how have trends in bariatric revisional surgery changed in the recent years?

**Methods:** The MBSAQIP database for 2015-2017 was examined for revisions of bariatric surgery. Patients that underwent RBS were identified by the primary CPT code, the REVCONV and PREVIOUS\_SURGERY field as well as secondary CPT codes. There is no exact code for gastric bypass (GB) to sleeve gastrectomy (SG) so we used 43644 (GB)+REVCONV+PREVIOUS\_SURGERY for this.



Results: For the years 2015-2017 there were 64,567 revisions/conversions out of 517,937 patients. The number of revisions increased over the study period by 5,653 cases. The most common revision was adjustable gastric band (AGB) to SG with 18,568 cases and the second was AGB to GB with 12,497 cases. There were 17,091 AGB removals. It is more difficult to track SG to GB but there were 9,591 unlisted cases, that may have been sleeve to bypass.

Conclusion: AGB are being taken out or converted and this group makes up the largest portion of revisions and conversions. It is difficult to track SG to GB but the number of unlisted cases continues to climb. This will likely surpass AGB conversions with time. The MBSAQIP should be modified to capture revisions/conversions of SG.

## A277

### **Acute Abdominal Pain in Pregnant Women After Roux-en-Y Gastric Bypass: Encouraging Results from a National Referral Centre**

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Máxima Medical Center<sup>1</sup>

*Background:* Pregnant women with a history of Roux-en-Y Gastric Bypass (RYGB) may develop acute abdominal pain related to the RYGB. Previous studies published alarming results regarding foetal and maternal morbidity and mortality.

*Objective:* Aim of this study is to analyse these outcome parameters for patients referred to the emergency department (ED) of our specialised centre with a national referral function in the Netherlands.

*Methods:* A single-centre retrospective cohort study. Pregnant women with a history of a RYGB who were referred to our ED between January 2014 and January 2019 with acute abdominal pain possibly related to a bariatric complication were included. Perioperative data were collected from the electronic patient files.

*Results:* Thirty-one patients were analysed. Median age was 30.0 (27.0, 35.0) years and median gestational age was 28<sup>+3</sup> (25<sup>+6</sup>, 30<sup>+3</sup>) weeks. Seven patients were treated conservative. 23 patients had to undergo surgery. Diagnosis was internal herniation (IH) (n=15), no active IH but closure of the mesenteric defect(s) with improvement of abdominal complaints (n=3) and invagination (n=5). One patient underwent an acute caesarean section due to suspicion of IH. Three patients required small bowel resection (13%). There were no maternal or foetal deaths.

*Conclusion:* Acute abdominal pain in pregnant women with a history of a RYGB may be related to bariatric complications. Centralization has a positive effect on maternal and foetal morbidity and mortality. Further awareness of bariatric complications within the obstetric care, prevention of diagnostic delay and transferal to specialized care is necessary to improve maternal and neonatal outcome.

**A278**

**Sleeve Gastrectomy Does Not Have Equivalent Improvement in Renal Function in All Patients with Chronic Kidney Disease**

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University of Cincinnati<sup>1</sup>

**Introduction**

Although sleeve gastrectomy (SG) is known, in general, to improve renal function in patients with chronic kidney disease (CKD), the impact on estimated glomerular filtration rate (eGFR) stratified by stage of CKD is less clear.

**Methods**

We performed a retrospective review on 1,932 patients who met NIH guidelines for metabolic surgery and underwent SG performed by one of three surgeons. 164 patients with CKD stages 1 through 4 were identified.

**Results**

Mean follow-up period was 1.57±1.0 years. Mean age was 56.4±9.9 years with a preoperative BMI of 47±9 kg/m<sup>2</sup>, which decreased to 38.9±8.7 kg/m<sup>2</sup> at most recent follow up ( $p < 0.001$ ). Significant decreases were observed in HbA1c level, daily number of oral hypoglycemics, daily long acting insulin use, and daily number of anti-hypertensives ( $p < 0.001$  each) (**Table 1**). Of the 67 patients with diabetes, 34.3% (n=24) achieved remission. 22.3% (n=31) of the 133 patients with hypertension discontinued all antihypertensives. Patients with CKD stages 2, 3a, and 3b showed significant improvement in eGFR. Reinforcing this evidence of improvement, patients with CKD 3a and 3b were more likely to downstage disease compared to those with CKD 4 (58.1% vs 73.1% vs 22.7%) ( $p < 0.001$ ) (**Figure 1**).

**Conclusion**

Renal function in patients with CKD stages 1 and 4 was not improved following SG; in contrast, patients with CKD stages 2 and 3 significantly improved. Early surgical referral and intervention are key in achieving the greatest improvement in eGFR and possibly delaying or reversing progression to end stage renal disease.

**A279**

**Effect of bariatric operation on gout disease: literature review and retrospective study on 68 gout patients**

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Asaf harofeh medical center

Methods 2200 obese subjects from Asia medical center from January 2011 until January 2017 , of them 201 patients had gout disease, of them 68 had follow up in our system. we reviewed these patients retrospectively . Parameters assessed included weight, body mass index (BMI), weight

loss, type of bariatric operation, uric acid level before and until 2 years after the operation, a medical history of gout, any onset of acute gouty attacks after the operation. Results These patients had a mean age of 50.7 (range 20 to 74) years and a mean BMI of 41.1 kg/m<sup>2</sup>. All patients were preoperatively diagnosed with gout and were taking medications such as non-steroidal anti-inflammatory drugs (NSAIDs) or allopurinol. 17 patients (25%) presented with acute gouty attacks in the first month postoperatively. 58 patients (85%) had at least one gout attack until one year before the operation in comparison to 23 patients (33%) one year after the operation. There was a decrease in uric acid level after the operation at one year and two years with p value less than 0.001. In our series, the prevalence of gout was of 9.1% and the incidence of acute attacks was 25% in the patients with a previous diagnosis of gout in the first month after the operation. There was resolution of the disease due to weight loss in our series of 46 patients (67%).

## A280

### **Revisional Robotic Bariatric Surgery: Three Years of Data from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program**

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#### Background:

Robotic surgery has been gaining popularity in the bariatric community. No large database studies have been done to date examining revisional surgery. The MBSAQIP database was used to determine if robotic surgery has an impact on outcomes of revisional bariatric surgery.

#### Methods:

We obtained the MBSAQIP PUF for 2015 – 2017. We selected all revisional cases in the database. We eliminated those which were done under emergent conditions. We selected all robotic, open, and conventional laparoscopic cases using the CPTs for open or laparoscopic Sleeves and Roux-en-y bypasses. Twelve open revisional sleeves were identified so these were excluded.

#### Results:

The resulting cases had 18414 sleeves (17263 laparoscopic and 1151 robotic) and 17463 roux-en-y bypasses (15211 laparoscopic, 618 open, 1634 robotic). Primary outcomes were serious adverse events, mortality, organ-space infections, bleeding, LOS, and operative time. Neither series demonstrated differences outside of operative time. Robotic surgery (sleeve = 144.37, Roux = 194.15) had a longer operative time than laparoscopic (sleeve = 101.95, Roux = 151.52) or open (171.32) surgery. This is the largest number of revisional surgeries studied to date using MBSAQIP.

#### Conclusions:

Robotic surgery has a similar outcomes to laparoscopic surgery in revisional surgery. As has been demonstrated across several studies robotic surgery has longer operative times. The question remains whether the majority of these cases are still within the learning curve of the

surgeons as has been theorized or if robotic surgery in the setting revisional bariatric surgery is longer due to the platform or some variation of the technique.

## **A281**

### **Weight Regain After Vertical Gastric Plication: What Surgical Options?**

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#### **Introduction:**

Vertical Gastric Plication (GP) has been performed as a weight loss procedure in France since 2010. The goal of this study was to assess the indications and outcome of revision for weight regain in patients with GP.

#### **Methods:**

If conservative treatment for weight regain or insufficient weight loss was unsuccessful or in case of anatomical anomaly, surgical revision was indicated.

#### **Results:**

Between February 2011 and September 2016, 300 patients had GP. The rate of patients with excess weight loss (EWL) > 50% was only 50%. 120 patients had either inadequate weight loss (66 patients) or weight regain (54 patients) and eventually required surgery. Roux en Y Gastric Bypass (RYGB) was performed in 52 patients (43.3 %). Sleeve Gastrectomy (SG) was performed in 44 patients (36.7 %). 24 patients (20.0 %) had miscellaneous procedures including mainly replication, or single anastomosis duodeno-intestinal shunt (SADI). Mean operative time was 168 min (range, 100–228) for RYGB, 108 min (range, 40–155) for SG, and 82 min (range, 50–220) for SADI, respectively. Median length of stay was 3 days (range, 2–5), regardless of the procedure. Major complications (occurred in 6 patients (5 %) including 3 leaks and 3 intra-abdominal abscess, all after SG.

#### **Conclusions:**

GP is associated with high rates of weight regain or inadequate weight loss. As compared to SG, RYGB or SADI seem to be safer revisional alternatives after failed GP.

## **A282**

### **Oral Opioids Are Not Needed After Bariatric Surgery**

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#### **BACKGROUND:**

The national opioid crisis has led to reduced utilization of opioid pain medications following minimally invasive surgery. In November 2018, our bariatric surgery program eliminated the use of all oral opioids following primary bariatric procedures.

## METHODS:

Between November 2018 and February 2019, 136 consecutive patients underwent laparoscopic sleeve gastrectomy (SG) or laparoscopic Roux-en-Y gastric bypass (LGBP) and did not receive any oral opiates following surgery. A multimodal pain regimen with judicious use of intravenous opioids was utilized, and an opioid free regimen was prescribed at the time of discharge. Data from this cohort was compared to data from 189 patients who received oral opioids following SG or LGBP between July 2018 and October 2018.

## RESULTS:

The average total morphine equivalents received were 17.41 for patients that received oral opiates and 10.45 those who did not ( $p < 0.001$ ). The average delta pain scores for each respective cohort were 0.46 and -0.16 ( $p < 0.001$ ). Average length of stay for each cohort was 1.38 and 1.34 days ( $p = 0.44$ ). The rates of emergency room presentation within 30 days of surgery were 20.7% and 19.8% ( $p = 0.83$ ). The rates of readmission within 30 days were 4.1% and 2.9% ( $p = 0.57$ ).

## CONCLUSION:

Eliminating oral opioids from post-operative pain regimens following bariatric surgery significantly reduces the total number of morphine equivalents administered following bariatric surgery and it significantly improves delta pain score. Removing oral opiates from discharge pain regimens following bariatric surgery does not result in higher rates of 30-day ED visits or readmission.

## A283

### **Endoscopic Gastric and Gastrojejunostomy Plication for Revision of Gastric Bypass**

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University of California, San Francisco<sup>1</sup>

## **Introduction:**

Nearly 20% of patients either fail to achieve goal body weight or experience weight regain following Roux-en-Y gastric bypass (RYGB). Endoscopic reduction of gastric pouch volume and gastrojejunostomy diameter carries reduced risk relative to operative revision, but long-term results have not been demonstrated. We hypothesized that endoscopic revision of prior RYGB may be an effective weight loss technique.

## **Methods:**

Sixteen post-RYGB patients underwent endoscopic gastric and gastrojejunostomy plication between 2014 and 2017 at a single academic institution. Patients lost to follow-up post-revision before 12 months were excluded. Post-RYGB weight loss failure was defined as  $< 50$  percent excess weight loss (%EWL); excessive weight regain was defined as  $\geq 25\%$  of total weight lost two years post-operatively.

## **Results:**

Twelve patients underwent endoscopic revision of RYGB and had follow-up of at least 1 year. 3

(25%) patients had experienced weight loss failure; the remaining 9 patients had excessive weight regain, with mean percent weight regain of 51.7% (SD±20.1). Following endoscopic intervention, mean maximum %EWL was 25.9% (SD±17.2); at 1 year, mean %EWL was 23.1% (SD±19.9). No correlation was found on linear regression analysis between post-plication weight loss and pre-RYGB BMI, %EWL post-RYGB, or percent weight regain pre-plication. Patients with initial weight loss failure on average had greater %EWL post-plication than those with excessive weight regain, but this was not statically significant (30.9±17.3% vs. 24.3±17.9%;p=0.59).

### **Conclusion:**

Endoscopic revision of RYGB effectively induced weight loss and these results were sustained at 1 year. Additional research is needed to identify characteristics which predict success with this technique.

### **A284**

#### **Single institution 10 year review of over 1700 vertical sleeve gastrectomies. Effect of Preoperative BMI on the Long-term Weight Loss Outcome**

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Abington Hospital<sup>1</sup>

### **Introduction**

Sleeve gastrectomy (SG) is an effective bariatric surgery, but its application to all patients may not portend to enough long term weight loss for some based on their initial BMI. It remains unclear if patients of various preoperative BMI's will benefit equally from SG.

### **Methods**

Ten year review of 1724 patients who underwent SG at Abington Jefferson Health. Data includes demographics, length of stay, perioperative complications, and weight-loss outcomes at 12-24-36 months. We defined BMI goals above the ideal body weight of 30 and 35 Kg/m<sup>2</sup> since failing to achieve these would allow for the conversation of the role of subsequent bariatric procedures.

### **Results**

There is strong evidence to support that patients with lower initial-BMI had far greater success in reaching the goal, both <30 and <35.

For the goal of achieving a BMI <30, there is no evidence to show an association between initial-BMI and reaching the goal at any interval post-surgery. A longer interval of time post-surgery was not related with higher success.

Success as expressed in terms of achieving BMI benchmarks is significantly compromised when the starting BMI requires a goal of dropping more than 10 BMI points.

### **Conclusion**

Starting BMI seems to be a major contributor to long term weight loss after VSG. This procedure is a safe intervention that will allow most patients to drop their starting BMI by 10 points. This

will be true at 1, 2 and 3 years after surgery. Second stage procedures may be needed for patients of highest BMI.

## **A285**

### **It's Never Too Late: Revisional Bariatric Surgery Appears Safe and Effective for Refractory Obesity in Advanced Age Patients**

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Tori Holtstaul <sup>1</sup>, Jason Bingham *Tacoma WA*<sup>1</sup>, James Sebesta <sup>2</sup>, Angel Reyes *Tacoma WA*<sup>1</sup>  
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**Introduction:** Bariatric surgery in geriatric patients (>65-years-old) has been proven safe and effective. Revisional bariatric surgery is infrequently required for cases of refractory obesity. Given rising life expectancy and the ever-growing obesity epidemic, revisional bariatric surgery will undoubtedly become more common in older patients. There is a paucity of data regarding revisional surgery the advanced age population. We hypothesize that revisional bariatric surgery is a viable and safe option in patients of advanced age.

**Methods:** Retrospective chart review of bariatric revisions performed at two bariatric centers of excellence between 2011 and 2017. Perioperative and long-term outcomes were compared between patients >65-years-old and those <65.

**Results:** 135 bariatric revisions were performed for weight loss purposes. Of these 10% (N=13) were >65 years old and 95% (N=122) were female. There were no differences between groups for preop BMI or co-morbidities. Types of revision (conversion to sleeve, conversion to bypass, limb lengthening and duodenal switch) were similar within and between groups. There were no differences between morbidity and mortality between the two groups, although the older cohort did require longer hospital length of stay (Table). Excess weight loss was similar between groups at 12-months (Figure), as was resolution of obesity related co-morbid conditions (Table).

**Conclusions:** Bariatric revisions in patients over 65-years-old appears to be safe and effective. Revisional surgery in this population was not shown to have increased morbidity or mortality with similar excess body weight loss and resolution of obesity associated comorbid conditions when compared to a younger cohort.

## **A286**

### **THE IMPACT OF CHRONIC KIDNEY DISEASE STAGE ON METABOLIC AND BARIATRIC SURGERY OUTCOMES**

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**Introduction:** Chronic kidney disease (CKD) independently increases the risk of 30-day adverse outcomes following metabolic and bariatric surgery (MBS). However, no studies have evaluated the stage of CKD at which increased perioperative risk is manifested. Here, we correlate 30-day major morbidities after MBS with extent of renal disease based on CKD Stage.

**Methods:** From the 2017 MBSAQIP database, we identified patients with CKD who underwent

sleeve gastrectomy or laparoscopic gastric bypass surgery. GFRs were calculated and cohorts were generated based on CKD Stage. Complication rates and rates of morbidity and mortality were compared between stages, and strengths of correlation were calculated.

**Results:** GFR and CKD Stage were calculated for 150,346 patients. There was a significant increase in the risk of major morbidity at each progressive stage of CKD ( $p < 0.001$  for all compared stages). There was a strong positive linear correlation between increasing CKD Stage and total morbidity ( $r=0.998$ ), including reoperation ( $r=0.885$ ), readmission ( $r=0.972$ ), unplanned ICU transfer ( $r=0.902$ ), and aggregate complications such as pulmonary ( $r=0.900$ ), bleeding ( $r=0.878$ ), or progressive worsening of renal function ( $r=0.845$ ). In logistic regression, for every 10-point decrease in GFR, odds of total morbidity increased by 8%.

**Conclusions:** An increased risk of perioperative complications may be seen in early stages of CKD, and risk is compounded in more advanced stages. Bariatric surgical candidates should be counseled on their increased risk of surgical complications even with mild CKD, and the benefits of bariatric surgery should be carefully weighed against significantly increased risks of complications in severe CKD.

## A287

### Effect of Gastric Bypass and Very-Low Energy Diet on cardiometabolic risk factors

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**Background:** Gastric bypass (GBP) may have a weight-loss independent effect on cardiometabolic risk factors (CMRF). We compared the effects of GBP and an isocaloric very-low-energy diet (VLED) on body composition and CMRF.

**Methods:** Non-randomized, single-center study, 3-week run-in-phase with a low-energy-diet (<1200 kcal/d) followed by GBP or 6-week VLED (<800 kcal/d). Statistics: Independent and dependent samples t-test, Mann-Whitney U test and ANCOVA; between-group differences adjusted for % weight-loss and baseline values.

**Results:** Seventy-eight subjects (52 women), mean (SD) age 48 (10) years, weight 128 (24) kg, BMI 43 (6) kg/m<sup>2</sup>, underwent GBP (n=40) or VLED (n=38). Mean 9-week weight-losses were 16.7 (3.6) and 13.9 (4.6) kg, respectively,  $P=0.005$ . Fat-mass was reduced by 12 (3.4) and 10.8



(3.5) kg,  $P=0.15$ , and fat-free mass by 4.7 (3.2) and 3.1 (2.2) kg ( $P=0.018$ ). Baseline-values of CMRF did not differ significantly between groups, while total-cholesterol and LDL-cholesterol declined significantly more in the GBP-group (Table).

**Conclusion:** Our results support the hypothesis that GBP reduces LDL-cholesterol independent of short-term weight-loss.

## A288

### **A Novel Digital Approach to Informed Consent for Roux-en-Y Gastric Bypass: A Randomized Controlled Trial.**

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Informed consent is of outmost importance in surgery. Modern technology, such as digital education platforms (DEP), can aid surgeons and patients in obtaining and documenting an informed consent.

We are conducting a prospective randomized controlled trial to compare the impact of adding DEP – an interactive, video-supplemented module on laparoscopic Roux-en-Y gastric bypass (LRYGB) – to a standard verbal consent (SVC) on patients' immediate and delayed retention of procedure-specific knowledge (multiple choice test), satisfaction with the clinical encounter (Client Satisfaction Questionnaire CSQ-8), and the duration of time required to obtain an informed consent.

For this interim analysis, we have 13/20 patients in control (SVC) and 10/20 patients in intervention (SVC+DEP) groups. Baseline demographic data (sex, level of education, and English literacy) were similar between groups, except for age ( $51.1\pm 12.2$  vs  $41.4\pm 6.8$  yrs;  $p=0.03$ ). Baseline procedure-specific knowledge was similar ( $75.0\pm 4.5\%$  vs  $77.4\pm 11.7\%$ ;  $p=0.52$ ). Knowledge retention post-consent was higher in SVC+DEP group ( $79.4\pm 5.2\%$  vs  $88.9\pm 5.2\%$ ;  $p<0.01$ ), with greater increase in knowledge from pre to post-consent ( $4.4\pm 6.2\%$  vs  $11.6\pm 5.2\%$ ;  $p=0.04$ ). Duration of time to obtain consent was shorter in SVC+DEP group ( $696\pm 130$  sec vs  $357\pm 220$  sec;  $p<0.01$ ). Participants in both groups were very satisfied with the consent process ( $97.1\pm 4.3\%$  vs  $98.4\pm 2.6\%$ ;  $p=0.42$ ). At 4-6 weeks, retention of procedure-specific knowledge was equivalent between groups ( $81.8\pm 7.9\%$  vs  $86.5\pm 5.1\%$ ;  $p=0.21$ ).

Addition of a DEP to a standard verbal consent for LRYGB improves patients' procedure-specific knowledge and shortens the duration of time required to obtain informed consent, while maintaining high patient satisfaction.

## A289

### **BMI LOSS AND RESOLUTION OF DIABETES FIVE YEARS AFTER STANDARD AND DISTAL ROUX- EN-Y GASTRIC BYPASS**

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**Background:** Standard Roux-en-Y gastric bypass (RYGB) may not ensure adequate weight loss or improvement of comorbidities in patients with body mass index (BMI)  $\geq 50 \text{ kg/m}^2$ .

**Objectives:** Evaluate if distal RYGB (50cm biliopancreatic and 150cm common channel) improves BMI loss and remission of type 2 diabetes compared to standard RYGB (50cm biliopancreatic and 150cm alimentary limb) in patients with BMI 50-60 $\text{kg/m}^2$ .

**Methods:** 113 patients were randomized to standard (n=57) or distal (n=56) RYGB. Patients and follow-up personnel were blinded. Group comparison was performed using ANCOVA or Fisher's exact test as appropriate.

**Results:** At five years, 48 (84%) patients with standard and 44 (79%) with distal RYGB attended follow-up. Mean(SD) BMI loss was 15.3(5.8)  $\text{kg/m}^2$  after standard and 15.5(5.5)  $\text{kg/m}^2$  after distal RYGB (p=0.82). Mean HbA1c level was 5.4(0.7)% after standard and 5.2(0.6)% after distal RYGB (p=0.013).

Seven of 10 patients after standard (70%) and 10 of 13 after distal RYGB (77%) achieved complete diabetes remission (p=1.00). Two patients in both groups had partial remission. One patient in each group had unchanged diabetes status; both preoperative insulin users. There was no de-novo diabetes. Mean (95% CI) HbA1c reduction for subjects with diabetes was -1.6(-0.5,-2.5) and -2.1(-1.3,-2.8), respectively (p=0.11). Ten of 12 patients after standard (83%) and seven of eight patients after distal RYGB (88%) had remission of prediabetes (HbA1c:5.7-6.4%), with complete normoglycemia after five years (p=1.00).

**Conclusion:** We observed comparable BMI loss five years after standard and distal RYGB. Both procedures had high and comparable diabetes and prediabetes remission rates.

## A290

### **Risk factors for postoperative pneumonia after weight loss surgery: A query of the 2015-2017 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Project (MBSAQIP) Database**

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**Introduction:** Patients undergoing bariatric surgery have been shown to be at increased risk of pneumonia compared to the general population. Although postoperative pneumonia is uncommon, it represents a serious potential morbidity, but to our knowledge there are few papers looking at specific factors that increase this population's likelihood of postoperative pneumonia. Our aim is to identify risk factors for postoperative pneumonia in patients having weight loss surgery.

**Methods:** MBSAQIP patient use files, 2015-2017 were queried for all patients who developed postoperative pneumonia after bariatric surgery. Patient characteristics were analyzed using Chi-square test to look at categorical variables. Logistic regression modeling was used to control for confounding variables. Significance was considered at  $p < 0.05$ .

**Results:** 553,750 patients had weight loss surgery. 1489 (0.27%) cases of postoperative pneumonia were identified. Each additional operative minute and each year of life significantly increased risk of pneumonia by 0.4% and 1.8%, respectively. Multiple other demographic and medical comorbidities were identified as risk factors (Table 1). Patients undergoing Roux-en-Y gastric bypass and duodenal switch were at significantly increased risk of pneumonia compared to gastric sleeve (OR 2.17 and 2.46), respectively.

**Conclusion:** We identified several significant risk factors for postoperative pneumonia in bariatric surgical patients which may help guide choice of operation. We suggest recognition of patients at increased risk of pneumonia after weight loss surgery and strategies to minimize this risk.

## A291

### **Alterations of Liver Fat Fraction Features Examined by Magnetic Resonance Imaging following Bariatric Surgery: A Self-Controlled Observational Study**

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Background. Obesity is a worldwide epidemic leading to non-alcoholic fatty liver disease. Alterations of liver fat by magnetic resonance imaging (MRI) following bariatric surgery is a promising feature, but few studies have been fully elucidated. Purpose. MRI was used to determine alterations of liver fat fraction (LFF) features following surgery. These were compared with the clinical non-alcoholic steatohepatitis score (C-NASH score) and evaluated for predictive factors for score changes postoperatively. Methods. Patients (n=69) underwent MRI to measure the LFF at baseline and 3 months after surgery. Paired sample t-tests were applied to investigate alterations of major parameters. Univariate analyses were performed to evaluate factors predicting C-NASH score changes at the 3-month follow-up. Results. Compared with baseline levels, LFF decreased significantly 3 months after surgery ( $P < 0.001$ ). Significant positive correlations were detected between C-NASH score and LFF levels ( $P < 0.001$ ). In

comparison, among the receiver operating characteristic (ROC) curves for C-NASH score change, the area under curve (AUC) of ROC curve of LFF was 0.812 [95% CI (0.707, 0.916)] and the cut-off value was 6.16%. Weight at baseline was a significant predictive factor for postoperative changes when the C-NASH score was  $\geq 3$  ( $P < 0.001$ ). The AUC of ROC curve of weight was 0.897 [95% CI (0.782, 1.000)] and 117 kg was the cut-off value. Conclusions. LFF decreased following bariatric surgery, which predicted C-NASH score changes after surgery. Patients with a higher risk of NASH (score point  $\geq 3$ ) at baseline and lower preoperative body weight had significantly increased effects of surgery on score change value.

## A292

### **Long Biliopancreatic Limb Roux-en-Y Gastric Bypass: Is it Superior than Regular Bypass?**

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Orlando Regional Medical Center<sup>1</sup>

**Background:** Up to 30% of Roux-en-Y gastric bypass (RYGB) patients fail to lose sufficient weight or regain the weight. Long biliopancreatic limb RYGB may be better in decreasing the chances of weight loss failure. This study aims to compare the safety and effectiveness of long biliopancreatic limb RYGB to regular RYGB.

**Methods:** A retrospective chart review was performed on 89 consecutive patients who underwent RYGB between Feb 4<sup>th</sup>, 2014, and Mar 12<sup>th</sup>, 2015. Of these, 43 underwent long biliopancreatic limb RYGB.

**Results:** Baseline characteristics including age and preoperative body mass index (BMI) were similar between the long and regular limb RYGB patients. The median length of hospital stay was similar (2 days for both groups). In the long limb RYGB group, the mean percentage of total weight loss (TWL) was 22.2%, 32.3%, 32.2%, and 35.8% at 6, 12, 24, and 36 months after the procedure, respectively. In the regular limb RYGB group, the mean TWL was 22.1%, 30.2%, 31.1%, and 33.1% during the same follow-up period. No significant difference in weight loss was observed between the two groups at any time point. Two patients in each group required 30-day readmission (4.7% and 4.3%). Two patients in each group required 30-day reoperation. One death occurred in the regular limb group due to a cerebrovascular accident after discharge.

**Conclusions:** Long biliopancreatic limb RYGB was not associated with a more significant weight loss after RYGB. The two procedures were similar in 30-day complications.

## A293

### **Weight regain following bariatric surgery: a literature review and comparison across studies using a large reference sample**

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**Background:** Understanding post-surgical weight regain is critical for informing expectations and planning interventions.

**Methods:** Articles published through January 2019 reporting weight regain following Roux-en-Y gastric bypass (RYGB) were identified and reviewed. The literature search yielded 2095 studies; 12 met inclusion criteria. To enable comparison across studies, weight regain (using the measure(s) and timing from each study) was recalculated for participants in a multi-center prospective cohort study (LABS-2) who underwent RYGB (N=1433), as a reference study.

**Results:** Including the LABS-2 study, median sample size was 108 (range 33-1433) (Table 1). Nadir weight was determined prospectively in 2 studies, by chart review in 5 studies and by self-report in 5 studies. Weight regain was reported by time since surgery in 11 of 12 studies (all but LABS-2). Among these 11, weight regain was reported a median of 4.6 years post-RYGB (range 3.4-8.9), with several continuous weight regain measures (i.e., mean 8.2-12.7kg; mean 9.7% of weight nadir; mean 19.5-30% of maximum weight lost) and minimum weight thresholds (i.e., 23.8-60.6%  $\geq$ 10% of weight nadir; 3.4-28.1%  $\geq$ 15% of weight nadir; 30.6%  $\geq$ 10% of maximum weight lost; 50.5-59%  $\geq$ 20% of maximum weight lost). Weight regain in the three largest studies, including the only other prospective study, was similar to LABS-2 (Table 1).

**Conclusion:** Published estimates of weight regain following RYGB appear to vary greatly. However, when using a large reference sample, with the same measures and timing as each comparator study, variations in weight regain were less pronounced, pointing to the need for uniform reporting.

## A294

### **Evaluation of Early Postoperative Pregnancy after Bariatric Surgery and Effects on Long-Term Weight Loss**

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**PURPOSE:** The American College of Metabolic and Bariatric Surgery (ASMBS) and the American College of Obstetrics and Gynecologists (ACOG) recommend delaying pregnancy for 12-24 months after bariatric surgery. However, weight loss is known to augment fertility and patients may pursue bariatric surgery for this benefit. Despite studies evaluating maternofetal outcomes after bariatric surgery, long-term weight loss has rarely been evaluated in patients becoming pregnant before the current guideline recommendations. We sought to determine patient adherence to these recommendations and the effect of early postoperative pregnancy (PoP) on long-term weight loss.

**METHODS:** A retrospective review of female patients undergoing initial bariatric surgery from 2008-2017 at a military bariatric center was performed. Cohorts were separated by presence and timing of PoP (not pregnant, <12 months, 12-24 months, and >24 months). BMI and percent excess weight lost (%EWL) were collected at 6 months and yearly for 5 years. Patient characteristics and comorbidities were evaluated.

**RESULTS:** Four hundred fifty-one patients were evaluated. Fifteen percent became pregnant

(n=67). Thirty-seven percent of PoP occurred within 12 months; 35% occurred at 12-24 months; 27% occurred after 24 months. PoP did not negate weight loss, as all groups had EWL>50% at 24 months. Additionally, no difference in %EWL was seen between pregnant and non-pregnant patients when followed for 5 years (p=0.29).

**CONCLUSION:** Current guidelines recommend delaying pregnancy for at least 12 months after bariatric surgery. Many patients may not adhere to these guidelines. However, postoperative pregnancy before 12 months does not affect initial or overall weight loss.

## A295

### **More than 5 years effects of Roux-en-Y gastric bypass versus sleeve gastrectomy on Chinese T2DM patients with BMI < 35**

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First Affiliated Hospital of Jinan Univ<sup>1</sup>

**Background** There were rare data about long term results for comparison of Roux-en-Y gastric bypass(RYGB) versus sleeve gastrectomy(SG) in Chinese lower BMI diabetic patients.

**Objectives** To investigate long term(more than 5 years follow up) results compared RYGB to SG in Chinese diabetic patients with BMI 27.5-35 kg/m<sup>2</sup>.

**Methods** Retrospectively analysed the patients underwent bariatric surgery from 2009 to 2014. All the patients met the criteria of BMI 27.5-35 kg/m<sup>2</sup>, aged 16-65 years, and with type 2 diabetes mellitus. All surgery were performed by one surgical team in two hospitals affiliated to Jinan University, Guangzhou ,China.

**Results** Seventy cases in RYGB group and 29 in SG group were included analysis. Mean follow up time for 6.7 years. All the characteristics at baseline were comparable. From 3 to 8 years follow up, RYGB gained significant excess weight loss percentage than SG( 91.2 vs.73.6, 85.4 vs. 50.6, 69.5 vs.43.1, 67.5 vs.42.0, and 70.4 vs.42.7 respectively). From 5 years after surgery, RYGB achieved lower HbA1c and fasting blood glucose(FBG) level than SG( 6.35 vs. 6.64, 6.25 vs.7.13, 6.13 vs.7.15, 6.56 vs. 7.20 for HbA1c, and 6.13 vs.6.9, 6.21 vs.6.9,6.21 vs.7.2 and 6.58 vs.7.1 for FBG respectively.) At five-year follow up, RYGB gained 48.6% complete and 42.9% partial remission rate, and SG gained 24.1% complete and 31.0 partial remission rate(P<0.01). Both groups achieved similar improvement of hyperlipidemia and hypertension.

**Conclusion** For more than 5 years follow up, RYGB seemed more effective for weight loss and remission of T2DM than Sleeve gastrectomy.

## A296

### **The association between body composition, 25(OH)D, PTH, systemic inflammation and bone mineral density in Chinese Bariatric surgery candidates**

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**Background** There are few data on the contribution of body composition and other factors to bone mineral density (BMD) in Chinese obese populations.

**Objectives** To investigate the association between body composition, 25(OH)D, Parathyroid hormone(PTH), systemic inflammation and bone mineral density in Chinese Bariatric surgery candidates.

**Methods** 764 patients were studied. Aged 18-68 yrs. BMD and body composition were measured using dual x-ray absorptiometry. 25(OH)D, PTH and c-Reaction Protein(CRP) were measured.

**Results** BMD at all sites were significant higher in male than in female ( $P < 0.01$ ). Femoral neck BMD in hypertension group was lower than in non hypertension candidates ( $P = 0.025$ ). Diabetes, smoke, and Helicobacter Pylori infection conditions had no association with BMD. Body weight, body mass index(BMI), lean mass, fat mass and hip circumference(HC) positively associated with total BMD, femoral neck and hip BMD ( $P < .005$ ). Waist circumference(WC) positively associated with total and hip BMD. Percentage of fat mass positively associated with hip BMD. No association was found between percentage of lean mass and BMD at all sites. BMI, body weight, lean mass, fat mass, WC and HC inversely associated with lumbar BMD. Age also inversely associated with BMD at all sites. No association between serum 25-hydroxyvitamin D, PTH and BMD. CRP positively associated with total BMD and hip BMD ( $P < 0.05$ )

**Conclusions** Significant differences in whole-body and site-specific BMD between the genders of Chinese bariatric candidates. Lean mass, fat mass and BMI had the similar contribution to specific BMD. 25(OH)D and PTH had no contribution to BMD at all sites.

## A297

### TOTAL JOINT ARTHROPLASTY CARE COLLABORATIVE INCREASES PATIENT TREATMENT FOR OBESITY

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Novant Health<sup>1</sup> OrthoCarolina<sup>2</sup> Johnson & Johnson<sup>3</sup> Janssen R&D<sup>4</sup>

#### **Background:**

Of the 24 million Americans with morbid obesity, 0.9% received surgical treatment in 2016. Based on our previous studies, a new referral program, the Total Joint Arthroplasty Care Collaborative (TACC), was initiated between a community bariatric practice and a total joint program. The aim of our current study is to investigate the implementation of TACC and determine if it improves access to treatment for obesity.

#### **Methods:**

A retrospective comparative cohort analysis of total joint patients referred to a bariatric program was performed comparing the number of referrals received from 2015-2017 during standard referral practices (SRP) to those received since 2018 during TACC. Outcomes analyzed included number of: referrals, bariatric consults, patients undergoing medical weight management (MWM), and patients undergoing bariatric surgery. Differences in rates were assessed using a Chi-square test.

**Results:**

There were 327 referrals (109/year) for SRP and 188 (150/year) for TACC. There were 72 bariatric consults (22%) for SRP and 89 (47%) for TACC ( $p<0.001$ ). 25 SRP patients (7.6%) and 26 TACC patients (13.8%) received MWM ( $p<0.031$ ). The proportion of patients having bariatric surgery has increased 3.1% (10) for SRP and 5.3% (10) for TACC with 10 more patients in the pathway.

**Conclusion:**

TACC has resulted in an increase in referrals, a significant increase in bariatric consults, a significant increase in patients receiving MWM, and an increase in bariatric surgery compared to SRP. Results will be updated as on-going patient accrual continues. Phase III of this project will evaluate surgical optimization and total joint arthroplasties performed.

**A298**

**Long-Term Weight Regain After Bariatric Surgery: Does Postoperative Percent Excess Weight Loss Matter?**

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**Introduction**

Weight loss (WL) trajectories can help guide bariatric patients towards postoperative WL goals. We evaluated the effect of preoperative BMI and short-term postoperative WL on weight maintenance of patients undergoing Roux-*en*-Y Gastric Bypass (RYGB) or Sleeve Gastrectomy (SG).

**Methods**

A single-institution retrospective review was done for patients undergoing laparoscopic primary SG or RYGB during 2013-2016. Patients were stratified by preoperative BMI (BMI<50 kg/m<sup>2</sup> vs BMI >50kg/m<sup>2</sup>) and into those achieving percent of excess weight loss (%EWL) <50% and ≥50% by 12-months. Follow-up occurred at 6 weeks, 3-, 6-, 9-, and 12-months and long-term. Statistical analysis were performed within each procedure, using SPSS v25.0,  $\alpha=0.05$ .

**Results**

158 (RYGB:N=63,SG:N=95) patients were included. Median long-term follow-up was 4 years [1.5-5.2 years] for RYGB and 4 years [1.5-5.5 years] for SG. RYGB patients with preoperative BMI<50kg/m<sup>2</sup> had a mean %EWL of 66.9±19.3% at 12-months, and 59.3±22.78% at long-term [Figure 1]. RYGB patients with initial BMI ≥50kg/m<sup>2</sup> had a mean %EWL of 48.8±10.6% at 12-



months, and 42.5±20.08% at long-term. For SG, patients with preoperative BMI<50kg/m<sup>2</sup> had a mean %EWL of 50.6±19.1% at 12-months, with a subsequent %EWL of 38.54±23.97% at long-term. SG patients with preoperative BMI≥50kg/m<sup>2</sup> had a mean %EWL of 39.3±15.3% at 12-months, and 22.80±22.42% at long term.

### **Conclusion**

Our data demonstrates that those with a preoperative BMI<50kg/m<sup>2</sup> and those who reached at least 50%EWL at one-year postoperatively, were less likely to have weight recidivism long-term. Future studies focused on patient selection and interventions to increase weight maintenance at long-term are required.

### **A299**

#### **Safety of sleeve gastrectomy in patients with a previous organ transplant: a propensity-score matched analysis of the MBSAQIP**

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**Background:** In patients with a previous organ transplant sleeve gastrectomy showed positive outcome in terms of weight loss and improvement of comorbidities, renal function, and quality of life. The safety of the procedure in this highly specific population is not well known.

**Objective:** The aim of this study was to assess the safety of sleeve gastrectomy (SG) in patients with a previous organ transplant.

**Methods:** In an observational MBSAQIP registry study, we compared the 30- day outcomes in patients with previous organ transplant who underwent sleeve gastrectomy with controls. The primary outcome was mortality. Secondary outcomes were reoperation, readmission, leak and bleed rates. Propensity-score matching was used to assemble a cohort of patients with similar baseline characteristics.

**Results:** Among 135, 938 eligible patients, 301 patients with previous organ transplant who underwent LSG and 301 controls had similar propensity scores. SG in patients with previous organ transplant, as compared with controls, was associated with similar risks of death (0.33% vs 0.33%; relative risk [RR], 1.00; 95% confidence interval [CI], 0.06 to 15.99, P=1.000), reoperation (1.00% vs 1.00%; RR, 1.00; 95% CI, 0.201 to 4.95, P=1.000), leakage (1.33% vs 1.00%; RR, 1.33; 95% CI, 0.30 to 45.96, P=0.705), and bleeding (1.99% vs 1.00%; RR, 2.00; 95% CI, 0.50 to 8.00, P=0.317). SG in patients with previous organ transplant was associated with higher risks of readmission (7.97% vs 3.99%; RR, 2.00; 95% CI, 1.00 to 4.00, P=0.045).

**Conclusions:** SG in patients with previous organ transplant leads to higher risk of readmission.

### **A300**

#### **Safety of Roux-en Y gastric bypass in patients with a previous organ transplant: a propensity-score matched analysis of the MBSAQIP**

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Texas Tech University Hospital<sup>1</sup>

**Background:** Roux-en Y gastric bypass (RYGB) is one of the options for patients with previous organ transplant who require bariatric treatment. The safety profile of RYGB in this specific patients group is not well known.

**Objective:** The aim of this study was to assess the safety of RYGB in patients with a *previous organ transplant*.

**Methods:** Observational registry study was performed. The 30-day outcomes in patients *with previous organ transplant* who underwent Roux-en Y gastric bypass were compared to controls. The primary outcome was mortality. Secondary outcomes were reoperation, readmission, morbidity, leak and bleed rates. Propensity score matching was used to control for potential confounding.

**Results:** Out of 51, 619 eligible patients, 97 patients *with previous organ transplant* who underwent RYGB and 97 controls had close propensity scores and were included in the analyses. At follow up of 30 days, no fatal cases were observed. RYGB in patients *with previous organ transplant* was associated clinically higher risks of readmission (17.53% vs 8.25%; relative risk [RR], 2.12; 95% confidence interval [CI], 0.98 to 4.59, P=0.049), leakage (5.15% vs 1.03%; RR, 5.00; 95% CI, 0.58 to 42.80, P=0.102), morbidity (10.03% vs 4.12%; RR, 2.50; 95% CI, 0.78 to 7.98, P=0.109) and similar risks of reoperation (6.19% vs 4.12%; RR, 1.50; 95% CI, 0.433 to 5.31, P=0.527), bleeding (5.15% vs 3.09%; RR, 1.67; 95% CI, 0.40 to 6.98, P=0.479).

**Conclusions:** Findings suggest that RYGB in patients with previous organ transplant might associated with clinically higher risk of readmission, leakage and morbidity.

### A301

#### **Sleeve gastrectomy histopathology practice: A survey of ASMBS surgeon members**

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Penn State Hershey Medical Center<sup>1</sup>

#### Background

Histologic examination of surgical specimens is fairly routine, and is mandated in many, but not all, states. Studies indicate that histopathologic abnormalities are common in sleeve gastrectomy specimens and could alter patient care. The purpose of this study was to survey bariatric surgeons about sleeve pathology practice patterns. There is currently no “standard” approach to specimen analysis throughout the bariatric community.

#### Methods

An eleven-question survey was distributed to the surgeon members of the American Society for Metabolic and Bariatric Surgery (ASMBS). Participation was voluntary and had no impact on societal membership. The SurveyMonkey Inc. (San Mateo, CA) questionnaire was distributed via email and was available for 8 weeks.

#### Results

The questionnaire was distributed to 1688 individuals, of whom 506 (30%) responded. Most respondents (59.6%) perform over 100 bariatric procedures per year, with a minority (36.62%)

performing 25-100, or (4%) less than 25. 98.8% of surgeons performed SG and 18.6% performed the duodenal switch procedure. Routine pathologic analysis was used by 83.64%, while 6.2% never send specimens for pathology and 10.1% send them intermittently. Poor clinical utility (n=42), cost (n=30), and rarity of abnormal findings (n=22) were identified as reasons not to send. However, pathologic analysis was found to have impacted clinical management by 232 surgeons (50.2%) within the prior year.

#### Conclusion

Sleeve histopathology was not routinely requested by all bariatric surgeons although more than half found it could change patient management. Since preoperative endoscopic analysis is also not routinely performed, SG pathology should probably be routinely requested.

### A302

#### **Low incidence of GERD after laparoscopic sleeve gastrectomy. Comparison of three techniques and with laparoscopic Roux-en-Y gastric bypass.**

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GERD after LSG is due to turbulent flow resulting from uneven sleeve diameter. Uneven sleeve diameter is due to incomplete fundal resection, stricture, sleeve rotation from division of lateral attachments and “zig-zag” staple line formation from use of 60mm staple loads (SL) in a curved line.

The validated GERD-Health Related Quality of Life (GERD-HRQL) instrument (0-45: none-severe GERD) was used preoperatively, 6/12 months and annually thereafter. Postoperative score at last follow-up was used. GERD was defined as GERD-HRQL  $\geq 10$ . LSG techniques included 38Fr bougie and 60mm SL (A), A plus gastropexy (B) and no bougie, 45mm SL and gastropexy (C).

122 LSG and 749 LRYGB patients with mean follow-up of 12.8 (6-72) and 23.7 (6-120) months were included. Hiatal hernia repair (HHR), or gastropexy was performed in 13/122 and 100/122 LSG patients. GERD-HRQL score difference (GERDscdiff) from baseline improved with HHR ( $12.5 \pm 12.7$  vs.  $5.0 \pm 11.6$ ,  $p = .0048$ ) and gastropexy ( $-2.1 \pm 11.3$  vs.  $7.8 \pm 11.1$ ,  $p = .0011$ ). Technique C had the best GERDscdiff (A:  $-2.1 \pm 11.3$ , B:  $6.2 \pm 9.0$ , C:  $7.9 \pm 11.2$ ,  $p = .0011$ ). There was a significant reduction of GERD postoperatively (41/122 (A: 3/22, B: 2/7, C: 36/93), vs. 11/122 (A: 4/22, B: 1/7, C: 6/93,  $p < .0001$ ). Postoperative de-novo GERD reduced from technique A to C (A: 4/22, B: 1/7, C: 2/93,  $p = .0088$ ). LSG and LRYGB had similar GERD-HRQL scores preoperatively ( $8.7 \pm 10.6$  vs.  $7.7 \pm 10.3$ ), and postoperatively ( $2.9 \pm 5.8$  vs.  $5.4 \pm 10.1$ ).

Postoperative GERD is not an inherent issue of LSG but technique-related. Gastropexy, avoidance of bougie and use of 45mm SL may achieve postoperative GERD scores comparable to LRYGB.

### A303

#### **Change in predicted 10-year and lifetime cardiovascular disease risk following Roux-en-Y gastric bypass: a 7 year multicenter prospective cohort study**

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University of Pittsburgh<sup>1</sup>

**Background:** The long-term change in cardiovascular disease (CVD) risk following bariatric surgery is not well characterized.

**Methods:** 1700 adults from 10 hospitals who underwent Roux-en-Y gastric bypass (RYGB) between 2006-2009 enrolled in a prospective cohort study. Research assessments were conducted pre-surgery and annually over 7 years. Sex-specific predicted 10-year and lifetime CVD risk were calculated using the Framingham-lipid, Framingham-BMI and Atherosclerotic (ASCVD) scoring algorithms among participants with no history of CVD.

**Results:** Of 1625 eligible participants, 1234 (75.9%) with CVD risk determination pre- and post-surgery were included (1013 females, 221 males). Data completeness was 64.8-66.6% across annual follow-ups. Based on the ASCVD, the percentage of females categorized as having high ( $\geq 7.5\%$ ) 10-year CVD risk declined from pre-surgery (12.7% [95% CI:11.2-15.4]) to 1 year post-surgery (3.4% [95% CI:2.3-4.5];  $p < 0.001$ ), then appeared to increase from 1 year to 7 years post-surgery (5.0% [95% CI:3.6-6.5];  $p = 0.14$ ). However, the percentage of females with high 10-year CVD risk was lower at 7 years versus pre-surgery ( $p = 0.007$ ). Time trends were similar for both sexes and all evaluated risk scores. However, the percentage identified as high risk varied by sex (higher in males vs females) and by specific score (higher with 10-year Framingham-BMI, lower with Framingham-lipids) across time points.

**Conclusions:** Although there was some worsening in predicted CVD risk across long-term follow-up, both females and males had lower predicted 10-year and lifetime CVD risk 7 years post-RYGB than pre-surgery, suggesting RYGB surgery can lead to sustained improvements in short- and long-term CVD risk.

### A304

#### **Comparison of the Outcomes of Single Stage Band to Sleeve Conversion to Sleeve Gastrectomy**

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University of Miami<sup>1</sup>

**Objective:**

To analyze the outcomes of single stage band removal and sleeve gastrectomy (BR-LSG)

compared to laparoscopic sleeve gastrectomy (LSG).

#### Methods:

MBSAQIP 2016 was the data source. Patients who underwent BR-LSG and LSG were identified. Patient characteristics (age, sex, BMI, cardiac disease, hypertension, hyperlipidemia, DVT, diabetes, dialysis, mobility, smoking use, steroid use, albumin, and hematocrit) and perioperative outcomes (hospital stay, renal failure, leak, myocardial infarction, pneumonia, pulmonary embolism, sepsis, septic shock, transfusion, re-intubation, ICU admission rate, DVT, death, conversion to open re-operation, and readmission rate) were recorded. Multivariable regression analyses were performed to evaluate the effect of BR-LSG versus LSG on outcomes and binary and linear regression models were studied to analyze the outcome variables effected.

#### Results:

101,217 patients were identified (96,763 LSG, 4,454 BR-LSG). Mean operative time was longer for BR-LSG (116.4 vs. 78.4 minutes). After correction for confounding factors, conversion to open(OR 1.910, p

#### Conclusion:

BR-LSG can be performed with low risk of mortality and adverse events. However, the risk of readmission and reoperation rates are higher. Older patients and patients with previous cardiac surgery are under increased risk of complications.

### A305

#### **Prevalence of thiamine deficiency is significant in patients undergoing primary bariatric surgery.**

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Bariatric patients are prone to micronutrient deficiencies, necessitating life-long nutritional supplementation and monitoring. Historically these deficiencies were thought to be driven by post-surgical changes in absorption, though recent data have demonstrated that obesity alone is also associated with micronutrient deficiencies. Despite the associated risks, many insurance plans do not cover costs associated with preoperative nutritional assessment that could identify patients prone to severe deficiencies postoperatively. Thiamine deficiency in particular can lead to permanent neurologic deficits and we aimed to identify its prevalence in our preoperative bariatric surgical patients. A retrospective review of deidentified data was examined that included whole blood thiamine measured from consecutive patients from 4/2018 to 4/2019 (n=274). Cohort characteristics were assessed including age, operation, preoperative body

weight, and race/ethnicity. The majority of the cohort were women (83%) with an average age of 45.7 years. Racial representation included White/Caucasian (73%) and Black/African American (20%), while operations included Roux-en-Y gastric bypass (61%), sleeve gastrectomy (31%), and revisions (8%). Thiamine concentration was normally distributed with a mean of 146nM. Overall, 5% of patients had preoperative thiamine concentrations below the lower limit of normal (<70nM). These patients were younger (40.8 years) and were all undergoing primary procedures (50% gastric bypass, 50% sleeve gastrectomy). Quoted rates of thiamine deficiency in the preoperative patient are variable, but we describe a significant number of patients at risk for thiamine deficiency. This warrants preoperative thiamine measurement in all bariatric patients due to the potential for permanent neurologic sequelae as well as other micronutrient assessment.

### **A306**

#### **CRP levels and post-operative complications in bariatric surgery: a single institution experience**

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#### **Background**

High CRP levels (> 70 mg/L) during the early post-operative course seem to have a strong predictive value for post-bariatric surgery (BS) complications. The aim of this study was to evaluate whether CRP levels can be used as an early predictor of unfavourable outcomes.

#### **Methods**

CRP levels were assessed before operation and on POD1 and POD3 and correlated with post-operative course and follow-up after discharge. Sensitivity, specificity and Chi-square test were used to compare CRP levels and occurrence of complications.

#### **Results**

From June 2017 to December 2018, 259 patients (206 F and 53 M) were prospectively assessed for CRP levels. This cohort included 236 laparoscopic sleeve gastrectomy (LSG), 12 laparoscopic Roux-n-Y gastric bypass (LRYGB) and 12 one-anastomosis gastric bypass (OAGB), respectively. Complications were detected in 12 out of 259 patients (4.6%), in particular 5 leaks, 6 perigastric hematomas, 1 anastomotic stenosis.

Thirty-four patients (13.1%) had CRP levels >70 mg /L on POD3, but only 6 of them had complications. Six more patients had complications with CRP levels <70 mg/L. CRP sensitivity and specificity were 50% and 89%, respectively, while high levels of CRP were associated with greater risk of complications (p=0.0006).

#### **Conclusions**

From our experience, CRP levels < 70 mg/L at discharge seem to bear low probability of post-operative complications, while the same cannot be said CRP levels > 70 mg/L. Further studies

and larger series are needed to confirm these results.

### **A307**

#### **Correlation between Obesity and Thyroid Cancer. Is there a link ?**

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Cleveland Clinic Florida<sup>1</sup>

#### **INTRODUCTION**

In the past three decades, thyroid cancer has become the fastest growing cancer of all malignancies in the United States. Based on data from the Surveillance, Epidemiology and End Results programme, thyroid cancer incidence increased 2.4-fold from 1973 to 2012. A link between obesity and thyroid cancer appears to be plausible, but the exact mechanism remains incompletely understood. The aim of our study is to determine if there is an association between severe obesity and risk of thyroid cancer.

#### **METHODS**

After IRB approval, a retrospective chart review was performed of patients who were diagnosed with thyroid nodules and had biopsies performed, from 2011 to 2017 at the Cleveland Clinic Florida. Two groups were created, the Study Group (SG); obese patients with thyroid cancer, and a Control Group (CG) non-obese patients without thyroid cancer. Analyzed variables included demographics, BMI, anatomic location of nodules and histopathologic reports. SPSS software version 25 was used to performed statistical analysis.

#### **RESULTS**

A total of 1,574 patients with biopsied thyroid nodules were reviewed. Of these, 382 (24.3%) had malignant findings. The SG was composed of 382 obese patients with thyroid cancer and the CG of 1,192 non-obese patients with benign findings. The mean age in CG was 56±6 years vs. 57±7 years in the SG. The predominant gender in both groups was female (CG=71% vs SG=72%), of Caucasian ethnicity (CG=79% vs SG=84%). Patients with thyroid malignancy had a higher BMI (CG=27±4 vs. SG=32±3 kg/m<sup>2</sup>; p=0.012\*).

#### **CONCLUSIONS**

Our results support previous reports that thyroid nodules are more often malignant in obese patients. Further studies are necessary to confirm these findings.

### **A308**

#### **Changes in Adipocyte (Ad) Retinol Metabolism May be Associated with Reduced Adipose Tissue Regulatory T Cells (AT-Tregs) after Bariatric Surgery**

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The Ohio State Wexner Medical College<sup>1</sup> The Ohio State University<sup>2</sup> The Ohio State Wexner Medical Center<sup>3</sup>

**INTRODUCTION:** Adipocytes are a storage site for retinol and function as antigen presenting cells (APCs) to stimulate AT-Tregs, which are key determinants of insulin sensitivity. While AT-Tregs are reduced in obesity, we unexpectedly found AT-Tregs decreased after bariatric surgery (BS). Given retinol's role in Treg differentiation, we hypothesize that post-operative vitamin A deficiency contributes to this reduction. We determined changes in Ad retinol-associated (RA) gene expression after BS and their association with plasma retinol and APC genes. **METHODS:** Subcutaneous Ad were isolated at the time of BS and 12 months post-operatively (n=24) and evaluated for genes related to retinol (LRAT, RDH, BCMO1, ALDH1A, RBP1-6) and APC (CIITA, CD80, CD74, CD86, HLA-DPA1). AT-Treg abundance (CD4+/CD25+/FOXP3+) was characterized using flow cytometry. **RESULTS:** Retinol binding proteins (CRBP1,5) and storage enzymes (LRAT) were significantly reduced in Ad after BS, suggesting reduced Ad retinol. Ad-RBP4, which binds plasma retinol, was increased post-operatively (2.8 vs 1.1, p=0.0007) but inversely correlated to plasma retinol (R= -0.67, p=0.02). Ad-LRAT positively correlated to Ad-CD80 (R=+0.69, p=0.01) and Ad-CD86 (R=+0.65, p=0.03), both important for Treg differentiation, while Ad-RBP4 inversely correlated to Ad-CD80 (p=0.0003) and Ad-CD86 (p=0.0004). Finally, the reduction in AT-Tregs was higher for patients with decreased post-operative plasma retinol compared to those with stable or increased levels (-60.9% vs -26.9%, p=0.08). **CONCLUSIONS:** Post-operative alterations in Ad gene expression suggest depleted retinol stores, which may decrease essential Treg co-activators. Along with the association between plasma retinol and AT-Treg abundance, this suggests a novel role for post-operative vitamin A supplementation.

### A309

#### **Improved glycemic control after bariatric surgery: Experience of a Minority Serving Hospital**

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Howard University Hospital<sup>1</sup> Howard University Hospital<sup>2</sup>

#### Introduction

Obesity disproportionately affects blacks in the US and is closely associated with multiple comorbidities, including diabetes. The aim of our study was to determine the effect of bariatric surgery on predominantly black diabetic patients who were severely obese.



## Methods

A retrospective chart review was conducted on bariatric surgery patients with diabetes (HbA1c>6.5 or use of anti-glycemic medications). Patient demographics, type of procedure and pre and postoperative HbA1c, medications and weight were evaluated. Improvement in glycemic control defined as HbA1C decrease >10% or decrease in number of medications including insulin. Descriptive analyses were performed to compare these groups.

## Results

A total of 157 patients were selected with a mean age (SD) of 48 +/-9 years, mean preoperative weight and BMI of 296.9 lbs and 47.5 respectively. 94% were African American and 76% were female. 79% of patients underwent a Roux-en-Y gastric bypass(RYGB) while 21% underwent a sleeve gastrectomy(SG). At 6 months post op, improvement in glycemic control was seen in 70/89 patients (79%) following RYGB compared to 13/23 patients (56%) following SG, p=0.031. Similar rates of improvement in glycemic control were seen in 43/50 patients (86%) following RYGB compared to 10/16 patient (63%) following SG at 24 months post op, p=0.04.

## Conclusion

Improved glycemic control was observed following bariatric surgery in this predominantly minority diabetic population; RYGB was found to be superior to SG in achieving this. Further studies are needed to assess the long-term durability of these procedures on diabetic improvement and remission in this population.

## A310

### THE STATE OF ADOLESCENT BARIATRIC SURGERY, 2015-2017: AN MBS-AQIP ANALYSIS

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**Introduction:** With the increasing prevalence of obesity in adolescents, bariatric surgical procedures represent an increasingly attractive treatment option. It is unclear to what extent adolescent bariatric surgery is being adopted, and which patient and provider characteristics are most to lead to bariatric surgery among adolescents.

**Methods:** Using the MBSAQIP database, we identified adolescent (< 19 years old) patients who underwent either sleeve gastrectomy or gastric bypass from 2015 – 2017. The overall prevalence and the percentage of the general bariatric population was compared by year, and regression analysis was performed to identify the patient and provider characteristics most commonly identified in adolescents compared to the general bariatric population.

**Results:** A total of 2,141 adolescent bariatric weight loss procedures were performed from 2015 – 2017. Both the total number of adolescent bariatric surgical procedures and the percentage of bariatric surgical procedures performed in adolescents increased in a linear fashion during this time (R<sup>2</sup>=0.9974, p=0.036). On regression analysis, adolescent bariatric patients were more likely to be male (OR=1.93, p<0.001) and less likely to be African American (OR=0.767,

p=0.007) compared to general bariatric patients. They also had a significantly higher BMI and were more likely to undergo sleeve (OR=1.398, p=0.009), rather than bypass.

**Conclusions:** While adolescent obesity represents a rare indication for bariatric surgery, its prevalence is increasing. Further research is warranted into the changing practice patterns surrounding adolescent bariatric surgery, including its safety and effectiveness in this population, as well as disparities in the availability of adolescent bariatric surgical care.

### A311

#### **Estimating the Impact of Obesity on Re-hospitalization of Women with Total Joint Arthroplasty**

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**Background:** Obesity (Body Mass Index  $\geq 30\text{kg/m}^2$ ) represents a staggering public health concern, affecting nearly 78 million adults in the United States and is linked to some of the leading causes of death such as heart disease and diabetes. The prevalence of obesity, and number of total joint arthroplasty (TJA) being performed in the US each year are increasing. About 60% of patients who had joint arthroplasty in 2014 were female. While obesity as a risk factor for post-operative complications after TJA has been studied extensively, there is a need for further investigation on the impact of obesity on the outcomes of TJA among women.

**Methods:** We used the Healthcare Cost and Utilization Project (HCUP) data, the largest collection of longitudinal hospital care data, to investigate the effects of obesity on the readmission rate among female patients with TJA. Studying larger national patient cohorts is believed to better illustrate the impact of obesity on TJA.

**Results:** Of the 345,768 female patients who underwent TJA, 23.11% were identified as obese (n = 79,919). After having adjusted for length of hospital stay, age, income, and insurance types, we found that, for obese female TJA patients, the odds of being re-hospitalized were 1.16 times the odds of the non-obese female (95% [CI] 1.12 – 1.20).

**Conclusion:** Female TJA patients who were obese were more likely to be re-hospitalized. Re-hospitalization is an important metric for TJA success. Attention must be paid to obese females undergoing TJA.

**Keywords:** Women's health, Obesity, Total Joint Arthroplasty, Readmission.

### A312

#### **Omentopexy during laparoscopic sleeve gastrectomy: Is it effective in reducing postoperative gastrointestinal symptoms**

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Background:

Postoperative gastrointestinal symptoms are common in patients undergoing sleeve gastrectomy.

This study is aimed to assess the effectiveness of omentopexy during laparoscopic sleeve gastrectomy in reducing gastrointestinal symptoms.

Methods:

A retrospective analysis of patients who underwent laparoscopic sleeve gastrectomy with and without omentopexy in the period between January 2016 to September 2017. All procedures were performed by three surgeons utilizing the same surgical technique. Data extracted included patient socio-demographics, preoperative body mass index (BMI), hospitalization period, treatments and post-operative gastrointestinal symptoms. It also contained the GERD-Health Related Quality of Life Questionnaire (GERD-HRQL) measuring symptom severity in gastroesophageal reflux disease (GERD). Data were analysed at 6, 12 and 18 months with reference to weight loss.

Results:

A total of 140 patients were included in this study, 70 in each group arm, and were followed up for more than a year. Age, gender, preoperative BMI, pre-operative co-morbid conditions like hypertension, diabetes, and asthma were considered as confounding variables among the two groups. None of the previous factors were statistically significantly different among both groups. The outcomes of both groups were compared in terms of postoperative nausea, vomiting, regurgitation, intra-hospital stay, medication use, early return to work, and EWL%. None of the previous outcomes was found to be significantly different between both groups.

Conclusion:

Omentopexy does not change the outcome for laparoscopic sleeve gastrectomy in terms of gastrointestinal symptoms or weight loss results.

### **A313**

#### **Does Pre-operative HbA1c Correlate with Post-Operative Rate of Complications after Bariatric Surgery?**

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Background: The most effective long-term treatment for diabetes in patients with severe obesity is bariatric surgery. After any gastrointestinal surgery, complication rates are higher in patients with uncontrolled diabetes. This project assessed the association between pre-operative HbA1C and post-operative complications for bariatric surgery patients at a safety-net institution.

Methods: Using electronic medical record (EMR) data, a chart review was performed of patients who had bariatric surgery from 2015-2018 and had a HbA1c in the 12 months prior to surgery. Demographic data and 1-year post-operative complication rate were assessed. Chi square and Wilcoxon tests were conducted for bivariable analysis of categorical and continuous variables, respectively. Multivariate logistic regression analysis was performed for testing effect of HbA1c after adjustment.

Results. 363 patients had bariatric surgery and had a HbA1c test pre-operatively; the average age was 47 years; 86% were female, the mean BMI was 49. HbA1c was: <7 in 84%; 7-8 in 10%; >8 in 6%. The overall rate of any complication was 15.7%. Demographic characteristics, BMI and HbA1c were not predictive of complication rate( $P>0.05$ ).

Conclusions: Neither patient characteristics nor level of glycemic control correlated with rates of post-operative complications in this sample of bariatric patients from a safety-net system. These results are limited by the very low number of patients with a hemoglobin A1c >8%. Broader assessments of the impact of uncontrolled diabetes on bariatric surgical safety should be done to balance the risk of surgery with the risk of delaying surgical treatment of diabetes

### **A314**

#### **Impact of Bariatric Surgery on Sexual Function, sex hormones serum profile and semen quality in men with class 3 obesity: preliminary one-year result from a prospective study**

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Lille Univ Hospital<sup>1</sup>

#### **Introduction**

Obesity is associated with a decrease in fertility both in men and women. Many data in the literature show the improvement of fertility after bariatric surgery (BS) in women, but only few data are available in men.

#### **Objectives**

To assess sexual function, sex hormone serum profile, and semen quality in an obese population and the impact of BS.

#### **Methods**

In this prospective cohort (NCT03528980), we included male patients eligible for BS from 2012 to 2018. Sexual function, assessed by International Index for Erectile Dysfunction (IIED), semen parameters and sex hormone serum profile were assessed preoperatively and one year after surgery.

#### **Results**

We included 58 patients (31 Gastric Bypass (GBP); 11 Sleeve Gastrectomy (SG)). Median IIED was 54 (17-62), with 10 patients presenting decreased sexual function (IIED<25). Median preoperative BMI was 46.1 (41.9-51.5) and did not differ between SG and GBP. All patients had their children naturally and the others had mostly normal semen parameters. Median BMI at one year was 31.4 kg/m<sup>2</sup>(28.9-37.8) and did not differ between SG and GBP. At one year, bioavailable testosterone and testosterone/estradiol ratio were significantly increased ( $p<0.001$ ). There was no difference between SG and GBP. Sexual function improved at one year ( $p=0.033$ ), especially libido and erection. Regarding semen parameters, sperm morphology ( $p=0.014$ ) was altered at one year. After BS, Vitamin E and Zinc were decreased at one year ( $p<0.001$ ).

#### **Conclusion**

At one year, SG and GBP improved male sexual function as well as sex hormone profile, while

semen parameters were altered.

### **A315**

#### **LAPAROSCOPIC CONVERSION OF ADJUSTABLE GASTRIC BAND TO DUODENAL SWITCH: 4 YEAR OUTCOMES FOR WEIGHT LOSS, COMORBIDITY REMISSION, AND COMPLICATIONS**

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Rex Bariatric Specialist<sup>1</sup> North Carolina Surgery/ Rex Bariatric Specialists<sup>2</sup>

#### Introduction

Conversions after laparoscopic adjustable gastric band continue to increase due to weight recidivism, band complications, and intolerance. While sleeve gastrectomy and gastric bypass remain the most common approaches, some question the efficacy and durability of these revisions. This series describes our experience with an alternative modality, laparoscopic conversion of adjustable band to duodenal switch.

#### Methods

From December 2014 to December 2017, 55 patients underwent conversion from adjustable gastric band to duodenal switch at a community hospital with at least 1 year follow-up. A retrospective analysis reviewed postoperative outcomes and complications.

#### Results

Patient mean demographics: age 48 years +/- 10.1, BMI 48 ± 6.1 kg/m<sup>2</sup> and length of stay of 2.5 ± 1.2 days. Excess weight loss (EWL) averaged 51%, 68%, 74%, 65% and 53% at 6, 12, 24, 36, and 48 months, respectively. No leaks, strictures, or 90 day mortality reported. Major early morbidity was 7%: bleeding (2), dysphagia (2). While minor fat soluble vitamin deficiencies occurred, none proved clinically significant and all were managed with oral supplementation. Two patients (3.6%) required limb lengthening for protein calorie malnutrition. Remission of Type 2 diabetes mellitus, dyslipidemia, hypertension, and sleep apnea measured 90%, 92%, 44%, and 79%, respectively. Average HgbA1c in diabetics changed from 7.3% pre-operatively to 5.3% post-operatively. Mean follow-up was 94%.

#### Conclusions

Conversion to duodenal switch offers an effective alternative for failed adjustable gastric band, inducing modest revision weight loss, excellent reversal of diabetes mellitus, hyperlipidemia, and sleep apnea with acceptable complication rates.

### A316

#### **Laparoscopic Adjustable Gastric Banding in Patients with Previous Roux-en-Y Gastric Bypass "Band-over-Pouch" – Not Worth the Weight**

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NYU Long Island School of Medicine<sup>1</sup> Stony Brook University School of Nursing<sup>2</sup>

**Introduction:** Revisional bariatric surgery continues to increase. Laparoscopic adjustable gastric banding (LAGB) after previous Roux-en-y gastric bypass (RNY), known colloquially as “band-over-pouch” has become an option despite a dearth of critically analyzed long-term data.

**Methods:** Our prospectively-maintained database was retrospectively reviewed for patients who underwent band-over-pouch at our MBSAQIP Center of Excellence in a 15-year period ending February 2019. We evaluated: demographics, comorbidities, operative procedures, and outcomes (30-day and >30-day).

**Results:** During the period, of 4,614 bariatric procedures performed, 42 were band-over-pouch with 39 (93%) being women. Overall, mean age was 49.8 years (range 26-75), a mean weight 251 pounds (range 141-447) and mean BMI 42.4 (range 26-75). Co-morbidities included: hypertension (n=31; 74%), diabetes (n=27; 64%), obstructive sleep apnea (n=26; 62%), gastroesophageal reflux disease (n=26; 62%), and osteoarthritis (n=25; 60%). All procedures were performed laparoscopically with no conversions to open. Mean length of stay was 1.2 days (range 1-3). Mean follow-up time was 4.2 years (range 0.5-10). Mean excess weight loss was 14.9%, 24.3%, and 28.2% at 6 months, 1 year and 4 years, respectively. There was one 30-day trocar-site hematoma requiring transfusion. Long-term events included: 1-year (1 endoscopy for retained food; 1 internal hernia), 3-year (1 LAGB erosion; 1 LAGB explant), 4-year (1 anastomotic ulcer), 6-year (1 LAGB explant and RNY revision), and 8-year (1 LAGB erosion). Two 5-year mortalities occurred (4.8%); both in association with hospitalization for chronic illness and malnutrition. Both erosions were successfully treated surgically.

**Conclusion:** Band-over-pouch warrants further analysis before widespread adoption as a revisional procedure.

### A317

#### **Registry-based analysis of safety Roux-en Y gastric bypass and sleeve gastrectomy in diabetic patients**

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**Background:** Roux-en Y gastric bypass (RYGB) and sleeve gastrectomy (SG) are effective treatments for diabetes. Choice of procedure should be based on the risk-benefit perspective.

**Objective:** The aim of the study was to assess the safety of Roux-Y gastric bypass compared to sleeve gastrectomy in patients with diabetes.

**Methods:** Preoperative characteristics and 30-day outcomes from the MBSAQIP data sets 2015-2017 were selected for all patients with diabetes mellitus requiring therapy with non-insulin

agents or insulin who underwent primary RYGB or SG. The primary outcome was mortality. Secondary outcomes were: reoperation, readmission, morbidity, leak and bleed rates. Propensity score matching was used to control for potential confounding.

**Results:** Among 136 565 eligible patients, 47 729 patients who underwent RYGB and 47 729 who underwent SG had similar propensity scores and were included in the analyses. RYGB, as compared with SG, was associated with a higher risks of death (0.18% and 0.10%, respectively; relative risk [RR], 1.77; 95% confidence interval [CI], 1.24 to 2.52;  $P<0.001$ ), reoperation (2.97% and 1.18%; RR, 2.51; 95%CI, 2.28 to 2.77;  $P<0.001$ ), readmission (7.44% and 4.16%; RR, 1.79; 95% CI, 1.70 to 1.89;  $P<0.001$ ), leakage (1.14% and 0.61%; RR, 1.87; 95% CI, 1.63 to 2.16;  $P<0.001$ ), bleeding (2.34% and 0.99%; RR, 2.37; 95% CI, 2.13 to 2.64;  $P<0.001$ ), and morbidity (5.55% and 2.65%; RR, 2.09; 95% CI, 1.96 to 2.23;  $P<0.001$ ).

**Conclusion:** RYGB in patients with diabetes mellitus requiring therapy with non-insulin agents or insulin was associated with higher risks of death, reoperation, readmission, leakage, bleeding, and morbidity.

### A318

#### **The Impact of the obesity disease on breast cancer stage in postmenopausal women**

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#### **Introduction**

Obesity and overweight are known to be associated with increased risk of breast cancer predominantly in postmenopausal women. We aim to assess the impact of obesity disease on breast cancer stage at diagnosis.

#### **Methods**

We retrospectively reviewed medical records of postmenopausal women with breast cancer at our institution from 2009 to 2018. The population was stratified in two groups, BMI<30 and BMI≥30. Basic demographics, smoking status, family history of malignancy and cancer-staging were appraised. Continuous and categorical variables were analyzed using T-test and Chi-Square respectively. Odds Ratio(OR) was measured for association between obesity and breast cancer stage.

#### **Results**

Of the 972 medical records reviewed, we identified a total of n=619(63.7%) postmenopausal women with BMI≥30 and n=353(36.3%) with BMI<30. We observed a predominant Caucasian population in both groups(n=469,75.8% and n=255,72.2%). Smoking status and family history of malignancy were comparable. Mean age between groups was homogeneous(64.92±10.0 vs. 63.98±8.83, p=0.149). Average BMI was 35.61±4.93kg/m<sup>2</sup> in the obese group and 25.19±3.03kg/m<sup>2</sup> in the non-obese. The predominant primary site in both groups was upper-outer quadrant(n=208,33.6%) followed by upper-inner quadrant(n=76,12.3%). Stage1A was preponderant in patients with obesity and without obesity, however, we found a statistically significant higher number of patients with cancer stage4 amongst postmenopausal women with

obesity(n=23,3.7% vs. n=24,6.8%; p=0.0289). This correlation was supported by an OR of 1.89(95%CI: 1.05-3.40, p=0.03).

### **Conclusion**

Postmenopausal women with obesity seem to be 1.89 times more likely to be affected by metastatic breast cancer when compared to women without obesity. Larger studies are necessary to confirm these findings.

## **A319**

### **Safety and efficacy of bariatric surgery in the elderly**

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### **Abstract**

#### **Background:**

Bariatric surgery in the elderly may not be widely performed due to concerns of efficacy and safety.

#### **Objectives:**

Review complications, weight loss, and comorbidity resolution in older vs. younger patients undergoing bariatric surgery.

#### **Methods:**

We retrospectively analyzed the results of sixty patients undergoing laparoscopic sleeve gastrectomy (SG) or laparoscopic Roux-en-y gastric bypass (LRYGB) over a three year period at our institution. A cohort of thirty patients, aged 40-55 (mean 46.9), matched by BMI and gender was compared to an older group of thirty patients, aged 65 and over (mean 67.2) with a mean body-mass index (BMI) of 43.8, and 42.1 respectively. Similar numbers of LRYGB and SG were done in each group.

#### **Results:**

The younger group demonstrated greater excess body weight loss% (EBWL) than the older cohort (70.8% vs 59.9%, NS). Resolution or improvement in diabetes, hypertension, hyperlipidemia, and sleep apnea in older vs. younger patients occurred in 81% vs 84%, 69% vs 64%, 54% v 57%, and 48% v 45% respectively. Complications were more frequent in the older population within 30 days of surgery (13% vs 0%,NS). No difference in the long-term complications was identified (16.7 vs 20%). The average length of stay for elderly patients was



longer,  $2.7 \pm 1.1$  days vs  $2.2 \pm 0.4$  days.

### **Conclusions:**

Bariatric surgery is equally efficacious in improving comorbidities in older vs. younger patients, though weight loss results may be less in the older population. Bariatric surgery in patients older than age 65 should be considered when appropriate.

### **A320**

#### **Anemia refractory to supplementation in Bariatric Surgery: Retrospective analysis in a high volume center.**

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The Obesity clinic at Hospital General Tlahuac<sup>1</sup> The obesity clinic at Hospital General Tlahuac<sup>2</sup>

**Objective:** To identify patients undergoing bariatric surgery who presented refractory anemia to oral supplementation during their postoperative follow-up, and who required parenteral infusion with iron, analyzing the clinical and biochemical characteristics.

**Design:** Retrospective, longitudinal, descriptive study of a prospective database.

**Methods:** All cases undergoing bariatric surgery in an institution between 2013 and 2017 were analyzed, with at least one year of follow-up. The incidence of anemia was determined at 0, 12, 18 and 24 months, and the characteristics of the patients who received parenteral therapy with iron were described.

**Results:** In the study period were made 435 bariatric surgeries. Regarding the baseline characteristics, the average hemoglobin was 13.4 g / dL, 6.2% presented preoperative anemia with an average age of 39.4 years and an average hemoglobin of 11.3 g / dL. In the postoperative follow-up, the prevalence of anemia was 25.8%, 27.5% and 34.6%, at 12, 18 and 24 months respectively. 12.2% of the patients required parenteral iron infusion. The average time for the first parenteral iron infusion was 16.7 months with an average preinfusion hemoglobin of 10.4 gr / dL. The 96.2% of the cases that required infusion with iron were related to gastric bypass.

**Conclusions:** Anemia in patients undergoing bariatric surgery is frequent. Most cases of refractory anemia to treatment with oral supplementation require iron infusion about a year and a half after surgery, correcting on average with two infusions.

### **A321**

#### **Prevalence of cancer types in overweight and obese subjects: A high performing institution analysis**

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## **INTRODUCTION**

The International Agency for Research on Cancer stated there is enough evidence to establish an association between overweight, obesity and at least 13 types of cancer. The aim of this study is to assess the prevalence of different malignancies in our institutional population with overweight and obesity.

## **METHODS**

We retrospectively reviewed the EMR of all patients at Cleveland Clinic Florida with cancer diagnosis from 2009 to 2018. Patients with BMI > 25 were included for analysis. Demographics, primary-cancer-site, histology, cancer-staging, smoking status, comorbidities, and family history were assessed. Independent analysis was performed based on age, gender, ethnicity, and BMI.

## **RESULTS**

Among 12754 patients reviewed, n=6846 (53.68%) had a BMI > 25. We observed a predominantly Caucasian and Male population (n=5537, 80.88% and n=3683, 53.80%) with mean BMI of 30.78 ± 5.10. The most prevalent types of cancer were breast (n=1111, 16.23%) followed by prostate (n=940, 13.73%) and colorectal (n=866, 12.65%). When divided by gender, prostate was the most prevalent malignancy in males and breast remained the most prevalent in females, followed by colorectal in both groups. Patients between 65-74 years-of-age had the highest overall prevalence of cancer (n=2194, 32.05%) prostate representing 18.9% (n=473). When comparing patients below and over 50 years-of-age, there was no statistically significant difference regarding colorectal cancer rates (14.01% vs. 12.42%, p=0.1680). We observed a higher rate of breast cancer in patients < 50 years-of-age (18.69% vs. 14.02%, p < 0.0001).

## **CONCLUSIONS**

From an institutional point of view, breast cancer seems to be the most prevalent type of cancer in patients with obesity. Interestingly, in this patient population colorectal cancer rates remained stable independent from age at diagnosis, while breast cancer rates were higher in patients < 50 years-of-age.

## **A322**

### **Comparing Post-operative Nausea and Vomiting After Bariatric Surgery Using a Shortened Version of a Validated Questionnaire**

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**Background:** Post-operative nausea and vomiting(PONV) is known to affect over two-thirds of patients after bariatric surgery. Washington University Weight Loss Surgery(WUWLS) currently uses a validated tool, the Rhodes Index of Nausea and Vomiting, to objectively evaluate PONV. However, this tool is impractical for clinical use because it consists of 8-questions. The objective of the study was to use item response theory(IRT) to identify the key items of the questionnaire and generate a mini-Rhodes Index to facilitate easy assessment of patient reported outcomes regarding PONV.

**Methods:** WUWLS surveyed patients post-operatively from 11/01/2017-11/01/2018. We used IRT to analyze these data with a probabilistic framework for modeling the interaction of a respondent with an item. We compared the performance of the original 8-item questionnaire to versions consisting of varying subsets of items. Performance of these shortened versions of the instrument were compared to the original version based on how much information they provide.

**Results:** We collected data from 309-patients and 696-questionnaires. Analysis of all possible two-item subsets from the survey identified short forms that retained reasonable measurement precision over the same range as the original instrument. A two-item form containing items about distress from vomiting and the number of times someone retched was optimal amongst shortened versions.

**Conclusions:** The present study demonstrates a novel use of IRT to develop a shortened PONV questionnaire, the mini-Rhodes Index. Shortening the tool to two-items makes the tool more feasible for clinical use. WUWLS is using the mini-Rhodes index to further understand PONV and optimize post-operative management.

### A323

#### **Repair of Post-Bariatric, de-novo Hiatal Hernias Improves Bloating, Abdominal pain, Regurgitation, and Food intolerance (BARF Syndrome).**

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**Background:** Post-bariatric, de-novo hiatal hernias are associated with a cluster of symptoms including Bloating (nausea/vomiting), Abdominal pain, Regurgitation, and Food intolerance or dysphagia (BARF). Patients with this cluster are at risk mis-diagnosis, malnutrition and maladaptive eating.

**Methods:** We reviewed the records of post-bariatric patients who underwent repair of de-novo hiatal hernias from 2012-19.

**Results:** We repaired de-novo hiatal hernias in 46 patients (age: 58±11yr; RYGB=20, SG=26), 11 years (4-23yr) post-RYGB and 3 years (1-9yr) post Sleeve Gastrectomy (SG). Weight was 195±40 lb, less 100 lb from pre-bariatric weight. Five patients had severe protein-calorie malnutrition. Anxiety, depression or bipolar-disorder were present in 47%, 33%, and 13%, respectively. We diagnosed hiatal hernia with a combination of UGI (67%; see Figure), CT scan (50%) and/or EGD (27%). All repairs were done laparoscopically with a posterior cruroplasty

after reducing the neo-stomach into the abdomen and without any complications. Mean follow-up is 15±9 months for the entire group. In the 35 patients (RYGB=17; SG=18) with follow-up >4 months weight remained stable; dysphagia or regurgitation improved in >85% of patients; nausea, vomiting or abdominal pain were not changed in 25-30% of patients (Table). Two patients recurred within 18 months and underwent a subsequent second repair that resolved their symptoms.

**Conclusion:** Hiatal hernias containing the neo-stomach or pouch after stapled procedures present earlier after SG vs RYGB and can be confirmed with a combination of imaging studies and endoscopy. Repair of de-novo hiatal hernia markedly improves symptoms of BARF in most patients and reverses malnutrition.

### A324

#### **The Impact of Bariatric Surgery on Health Care Costs: Six-year Results from A Canadian Bariatric Surgery Cohort Study**

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Memorial University<sup>1</sup> University of Otago<sup>2</sup> NL Centre for Health Information<sup>3</sup>

Objective: Bariatric surgery results in significant and sustained weight loss, improvements in obesity-related comorbid conditions and increased quality of life. There are limited data on health care costs of patients who undergo bariatric surgery in Canada. The study objective is to examine the impact of bariatric surgery, specifically laparoscopic sleeve gastrectomy (LSG) on the health care costs of patients over a multi-year period. Methods: This is a longitudinal analysis (2008-2017) of health care costs associated with hospitalization admissions, outpatient or surgical day care and physician visits for 201 patients enrolled in the Newfoundland and Labrador Bariatric Surgery Cohort Study. Using data linkage methods, the clinical data of study participants was merged via a health insurance number with several administrative health care data sets. Differences in health care usage and costs were examined three years pre and three years post-surgery. Results: The sample(n=201) was female(81.6%) with an average age of 43.8 years and average BMI of 48.3kg/m<sup>2</sup>, respectively. Percent excess weight loss(% EWL) was 52.6% at 24 months. Close to half had dyslipidemia(47.9%), hypertension(47.9%) and diabetes(41.8%). Total health care costs associated with hospital admissions, surgical day care use and visits to a physician increased by 33%, three years post-surgery, driven by an increased use of surgical day care services after surgery. Compared to pre-surgery, reasons for health care use post-surgery changed and are reflective of patient's health status.

### A325

#### **Comparing Remission and Relapse of Hypertension after Bariatric Surgery: Vertical Sleeve Gastrectomy versus Roux-en Y Gastric Bypass**

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**Background:** Bariatric surgery results in rapid weight loss and resolution of comorbidities such as hypertension. We aimed to compare which of the two most common procedures; vertical sleeve gastrectomy (VSG) or Roux-en Y gastric bypass (RYGB) was associated with sustained remission from hypertension and identify other independent predictors of sustained remission.

**Methods:** This was a retrospective study design using Truven MarketScan database enrollment, inpatient and pharmacy claims from 2010 to 2016. A cohort of hypertensive bariatric patients was created using detailed inclusion and exclusion criteria. Remission was defined as no refill of antihypertensive medication 30 days after a patients' medication was expected to run out and relapse as medication refill after at least 90 days of remission.

**Results:** Of 7006 patients in our cohort, 5874 experienced remission of their hypertension (83.8%). 745 of the 5874 (12.7%) patients later experienced relapse. The adjusted relative rate of remission between VSG and RYGB was 1.06 [95% CI; 1.0, 1.11.] The adjusted relative rate of relapse between VSG and RYGB was 0.84 [95% CI; 0.71, 0.97]. A higher number of medications at the time of surgery was associated with a decreasing rate of remission and an increasing rate of relapse of hypertension.

**Conclusion:** There was no difference in the rate of remission of hypertension between VSG and RYGB. VSG was associated with a decreased rate of relapse of hypertension compared to RYGB. The number of medications at the time of surgery was the most important predictor of remission and relapse of hypertension after surgery.

### A326

#### **Evaluate the Efficacy of Bariatric/Metabolic Surgery: Among Adolescents with Severe Obesity**

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**Background:** The impact severe obesity has on self-esteem, particularly in the early adolescent period, needs to be seriously deliberated as it leads to risky behaviour and can significantly affect the quality of life.

**Objective:** This study aims to evaluate the efficacy of treating severe obesity and its comorbidities among adolescents.

**Methods:** A retrospective study conducted on adolescents with severe obesity who underwent BMS from 2010 to 2017 at a single centre were collected, reviewed and analysed.

**Results:** A total of 95 patients underwent one of three BMS procedures. Forty-three patients (45%) had a sleeve gastrectomy (SG), 24 (25%) a one-anastomosis gastric bypass (OAGB), and

28 (30%) a Roux-en-Y gastric bypass (RYGB). Fifty-six (59%) were males. The average age was  $15.7 \pm 2.6$  years, and the average BMI was  $40.1 \pm 6.6$  kg/m<sup>2</sup>. Follow-up ranged from 6 months to 6 years. There were no complications and no mortality in this series. At one year the per cent excess weight loss (%EWL) and per cent total weight loss (%TWL) was 69.3% and 25.2%, respectively, and these decreased to (54.4% and 19.2%) at six years. There were resolutions of sleep apnea (SA, 40%), type 2 diabetes (T2D, 50%), and hypertension (HTN, 60%). Nutritional deficiencies observed in some patients at one year, but values normalised with nutrient supplements.

**Conclusions:** Bariatric/metabolic surgery is an effective, safe treatment for severe adolescent obesity in short- to medium-term. Further studies are required to investigate the long-term effects with comparisons of different bariatric/metabolic procedures.

### A327

#### **Short Term Outcomes Comparison of Minimally Invasive Revisional versus Primary Bariatric Surgery**

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#### **Background:**

There is an increasing volume of revisional bariatric surgery. Data indicates these surgeries can result in improved weight loss and resolution of co-morbidities. However, multiple studies are showing worst outcomes in revisional surgery including increased complication rates and longer hospital stays. As an institution we have a high volume of revision surgery which is handled both laparoscopically and robotically.

#### **Methods:**

A retrospective review of a prospective database of 441 patients who had undergone bariatric surgery at Baylor University Medical Center by a single experienced bariatric surgeon from 2016 to 2018 were included in this study. The patients were divided into those undergoing initial versus revisional bariatric surgery. The primary outcomes were length of stay, readmissions, and complication rates comparing initial to revision surgeries. Secondary outcomes included comparing similar outcomes in robotic versus laparoscopic revision surgeries.

#### **Results:**

Almost a quarter of the 441 bariatric surgeries were revisions. Patient undergoing revisions had a significantly longer hospital stay (3.9 vs. 1.4 days), longer duration of surgery (160 vs. 103.8 minutes), and a higher 30 day readmission rate (12.8% vs. 5.4%). Robotic revisions had a longer operative time than laparoscopic revisions by an average of 97 minutes, but a decreased readmission rate related to bariatric-specific problems (17.5% vs. 5.8%).

#### **Conclusion:**

Revisional bariatric surgeries had significantly longer lengths of stay, longer surgeries, and a higher readmission rate. There is increasing evidence indicating revision surgery has a unique

set of outcomes, and standards need to be set accordingly for expected outcomes.

### A328

#### **Exploring perioperative outcomes in metabolic and bariatric surgery amongst the elderly: An analysis of the 2015-2017 MBSAQIP database**

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**Introduction:** Metabolic and bariatric surgery (MBS) is increasingly performed in those greater than 65 years old. Studies have shown equivocal results regarding perioperative outcomes. Our study objective was to explore perioperative outcomes in elderly MBS patients compared to those < 65 years old.

**Methods:** Primary sleeve (SG) and gastric bypass (RnYGB) cases were identified from the 2015-2017 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database. Selected cases were stratified by age ( $\geq 65$  years vs.  $< 65$  years). Univariate and multivariate logistic regression analysis were performed comparing descriptive statistics and outcomes in elderly compared the general MBS cohort.

**Results:** 26,557 (5.6%) of MBS cases were performed in elderly patients. Elderly patients were more likely to be Caucasian, male, have a lower mean BMI, received a gastric bypass and robotic-assisted surgery. Elderly patients had a significantly higher disease burden (**Table 1**). All outcome measures were significantly higher ( $p < 0.05$ ) in elderly patients (**Table 1**), including overall and related mortality and morbidity. Unlike Black race, BMI, heart disease, renal disease, venous thromboembolism, and gastric bypass procedure, age was not a significant predictor of adverse outcomes on multivariate logistic regression analysis (Wald 3.38,  $p = 0.07$ ). The number needed to harm (NNH) for overall and related morbidity were 58 and 230, respectively.

**Conclusion:** Elderly MBS patients have higher disease burden and higher adverse outcomes following MBS; however, MBS in this cohort remains overall safe. Procedure consideration should favor SG as RnYGB was independently associated with worse outcomes.

### A329

#### **PRELIMINARY RESULTS OF ENDOSCOPIC SLEEVE GASTROPLASTY (ESG) FOR OBESE POPULATION**

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#### **INTRODUCTION**

Obesity presents a high prevalence throughout the world.

This has led to the development of less invasive methods such as endoscopic sleeve gastroplasty (ESG)

## OBJECTIVE

Preliminary results with ESG in our country.

## MATERIALS AND METHODS

Patients were included November 2017 - January 2019.

Patients were adults without contraindications for general anesthesia. All patients had a multidisciplinary

evaluation. ESG took 75 min and is done in the OR

Indications for the procedure were: BMI between 28 - 41 (average 33) and associated comorbidities.

The follow-up was performed at 1,3,6 and 12 months, calculating the total percentage of lost weight (% TWL), the

percentage of excess weight lost (% excess weight loss,% EWL), the body mass index (BMI) and the variation of the BMI.

## RESULTS

44 patients. Age between 18 - 68 yo

Majority of the controls were performed between the 1st and the 6th month.

% TWL ranged from 8.6 in the first month; 13,6 in the third month; 14.3 at the sixth month and 14.4 at 1 year

%EWL was 52.3 in the first month; 90% in the third month; 82.1 at the sixth month and 84.7 at 1 year

Only one complication occurred during the study, which was satisfactorily resolved

## CONCLUSION

ESG have shown to be a minimally invasive endoscopic bariatric intervention, that is safe and effective for treatment of

obesity in the short term. It seems to be more effective than medical treatment and intragastric balloons. It needs

further follow up.

## A330

### **Predictive Factors of Bariatric Surgery on Carotid Intima-Media Thickness (C-IMT) in Chinese Patients with Obesity and Type 2 Diabetes Mellitus (T2DM)**

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#### **Abstract**

**Background:** There has been a strong relation exists between obesity and CVD risk factors, and as shown above, it has been proven that obesity surgery can reduce the incidence of T2D and dyslipidemia.

**Objectives:** To investigate the predictors of carotid intima-media thickness thickening in Chinese obese and T2DM patients, we analyzed the effect of obesity surgery on C-IMT changes



and discussed possible predictors of postoperative factors.

**Methods:** We retrospectively and prospectively reviewed patients undergoing bariatric surgery included LRYGB and LSG in the First Affiliated Hospital of Jinan University between April 2017 and October 2017. Anthropometric data, lipids and C-IMT data was collected before and 3, 6 and 12 months after bariatric surgery

**Results:** This study enrolled 80 cases (28 with T2DM), which difference of C-IMT changes were significant between T2DM and non T2DM (-0.024mm vs -0.031mm), including demology character and serum biochemistry index. Multiple linear regression analysis showed that age, hight, Preoperative C-IMT were independent risk factors for C-IMT changing in cases without T2DM (Constant=-0.551,  $\beta_1=0.006$ ,  $\beta_2=0.004$ ,  $\beta_3=-0.35$ ,  $p<0.05$ ), and in T2DM participators, smoking and total triglyceride(TG) were predictors of C-IMT changing (Constant=0.084,  $\beta_1=0.245$ ,  $\beta_2=-0.037$ ,  $p<0.05$ ).

**Conclusions:** Obesity surgery is more effective at non T2DM patients than T2DM for C-IMT improving. Smoking and TG are related to improvement of C-IMT.

### A331

#### **Standard Laparoscopic Sleeve Gastrectomy vs Laparoscopic Sleeve Gastro-Omento-Pexy Technique and GERD: A Retrospective Case Control Study**

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Background: Laparoscopic sleeve gastrectomy (LSG) affords patients excellent long term excess weight loss; however, one of the primary problems reported with this procedure is new onset or worsening gastro-esophageal reflux (GERD). Studies show the rate of de novo reflux after LSG to be 47.8%. Long-term GERD portends poor quality of life and increases the risk of esophageal cancer. We propose modifying the LSG by reattaching the omentum to the “new” greater portion of the sleeve stomach reduces the incidence of GERD by restoring natural anatomy.

Methods: This was a retrospective case control study. All patients undergoing laparoscopic sleeve gastrectomy between October 1, 2015 and September 30, 2016 were included. Demographic and weight loss data were collected via chart review. The Gastro-esophageal Reflux Disease Between the Health-Related Quality of Life (GERD-HRQL) Questionnaire was also conducted.

Results: A total of 329 patients were analyzed – 168 in the LSG group and 161 in the modified LSG group. There were no reported 30 day readmissions or revisions. Eleven vs 17% of patients were diagnosed with GERD preoperatively in the study and control groups, respectively, and only 6.4% vs 5.5% had documented symptoms of GERD at 12 months postoperatively. Average GERD-HRQL scores were 7.08 vs 8.04 for the study vs control groups, with ranges of 0-38 and 0-32, respectively.

Conclusions: Our results suggest that modification of the LSG to restore natural anatomy does not reduce the occurrence of GERD symptoms up to 12 months postoperatively. However, more data is needed to qualify these results.

### A332

#### **One anastomosis gastric bypass: outcomes and results.**

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**Introduction:** One anastomosis gastric bypass (OAGB) is a promising restrictive and malabsorptive bariatric procedure, which yields very good results with an acceptable rate of complications. **Objective:** Our presentation aims to describe our simplified technique and to evaluate the outcome of OAGB. **Materials and methods:** This study is a retrospective analysis of 186 patients who underwent OAGB between January 2012 and January 2016 in Nini Hospital, Tripoli, Lebanon. Patient demographics, comorbidities, operative and postoperative data were evaluated. **Results:** 186 patients underwent OAGB (126 females, average age 33, BMI = 42.8 kg/m<sup>2</sup>). 22 patients (12%) had prior bariatric surgery. 106 patients (57%) had diabetes, 63 patients (34%) had hypertension and 15 patients (8%) suffered from obstructive sleep apnea. 3 patients (1.6%) had early minor complications (Clavien-Dindo 1–3a), and 4 patients (2.15%) suffered early major complications (Clavien-Dindo ≥3b) that necessitated re-operation, All the 4 patients had revisional surgery. The average length of hospital stay was 2 days (range 1-60 days). Operation's success, defined as percentage of excessive weight loss greater than 50%, was 98.9% at 24 months postoperatively. 94.3% (100 patients) of Diabetic patients achieved full remission. Furthermore, the percentage of patients with obstructive sleep apnea and gastroesophageal reflux disease, achieving full remission was 93.3% and 85.6%, respectively. Iron deficiency presented in 24 (12.9%) patients postoperatively, vitamin B12 deficiency in 21 (11.3%). **Conclusion:** OAGB is a safe and effective weight loss procedure that carries low complications rate, with a notable remission of type 2 diabetes

### A333

#### **Technique of Choice for Conversion from a Failed Sleeve Gastrectomy**

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ScientificWriting Corp<sup>1</sup> Isfahan University of Medical Sciences<sup>2</sup> Nychhc<sup>3</sup> Tehran University of Medical Sciences<sup>4</sup>

**Background:** Although sleeve gastrectomy (SG) is the most commonly performed bariatric procedure, weight loss failure or complications are inevitable.

**Objective:** To summarize the literature on the most preferred procedure for conversion from a failed SG.

**Methods:** Systematic review of the literature in PubMed/Medline to retrieve relevant studies describing the conversion of SG to another weight loss procedure.

**Results:** Of a total of 748 conversions analyzed, 68.7 % were to RYGB, 17.4% to LBPD-DS, 4.6% to OAGB-MGB, 3.1% to laparoscopic omega-loop gastric bypass, 2.1% to single-anastomosis duodeno-ileal bypass or simplified BPD-DS. Of these, 68.05% were female and 31.94% were male. The mean age was 41.32 years (16-79 years). The average operation time was 136.60 minutes (45-300 mins). The average length of hospital stay was 4.3 days (1-29 days). The mean follow-up time was 22.06 months (0-76 months). The conversion was performed 28.91 months after the index SG (4 days to 113 months). Insufficient weight loss were the most common reasons for conversion (43.8%) followed by intractable GERD (16.21%), previously planned 2-staged bariatric surgery (8.44%), severe co-morbidities (5.49%), dysphagia (3.61%), etc. The average BMI was 50.23 kg/m<sup>2</sup>(34-84) before the index SG, 41.02kg/m<sup>2</sup> (22.3-72) before the conversion, and 33.47 kg/m<sup>2</sup> (21.9 - 47.8) at the last follow-up. Nutritional deficiency, food intolerance, and leak were the most common complications following conversion from SG.

**Conclusion:** The conversion technique for a failed or complicated SG should be selected on a case-by-case basis. Regardless of the indication, patients undergoing conversion should be closely monitored for common and fearsome complications.

**A334**

### **A Qualitative Study of Factors related to weight regain following Rou-en-Y Bariatric Surgery**

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State of Michigan

#### **Abstract**

During the past decade, obesity has become a worldwide epidemic, and bariatric surgery has been used to treat obesity. Previous researchers have addressed the success of the Roux-en-Y bariatric (RYGB) surgery within 12 months or later of the surgical procedure; however, a lack of research exists regarding participant success in maintaining their postsurgery weight loss long term. The current qualitative, phenomenological study was based on the conceptual framework of social learning and examined the beliefs, experiences, and perceptions of women who underwent RYGB weight loss surgery but did not maintain their ideal weight during the 1st year and later following surgery.

Results suggest that essential factors were commitment to change, the effects of body change and social support. These factors were based on sub-textual themes of eating habits, quality of life, lifestyle change, mentality, misconceptions of surgery, weight loss, excess skin, social support, and weight regain. This study contributes insight into weight gain and weight loss maintenance following bariatric RYGB surgery and is useful for medical and weight loss professionals, bariatric patients, and community members. Stakeholders increased understanding of weight gain and weight loss maintenance following RYGB surgery.

### A335

#### **Late term hiatal hernia after gastric bypass: an emerging problem.**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Introduction:** Gastric bypasses were the most common bariatric surgery for many years. Long term complications after gastric bypass are relatively common. Symptomatic hiatal hernia (HH) with pouch migration is a less well known complication but when symptomatic will require surgical repair. This diagnosis is easy to miss and is likely under reported. We present a case series of late term hiatal hernias after gastric bypass, and discuss the common presentation and treatment.

**Methods:** A retrospective chart review was performed of patients presenting with late term HH. The review captured presentation and symptoms, age, time from index surgery, radiologic studies and the re-operative details. If available the original operative note was reviewed along with any pre-operative imaging studies. A review of the literature was also performed.

**Results:** Seven patients were included in the study. The average time from the index surgery was 11.9 years (range 9-16). The average age of the patient at time of presentation was 60.1. The average body mass index at time of the HH repair was 34 kg/m<sup>2</sup>. The most common presenting symptom was dysphagia. Both computed tomography and upper gastrointestinal series were used for diagnosis with a common finding of HH and pouch migration into the mediastinum. HH repair with bioabsorbable mesh was performed in all patients, with an average operative time of 105 minutes.

**Conclusions:** HH can present late after gastric bypass and is often unrecognized. When symptomatic, it needs to be addressed surgically and can usually be done through a minimally invasive approach.

### A336

#### **Mesenteric abscess after gastric bypass caused by a permanent suture**

Benjamin Clapp *El Paso TX*<sup>1</sup>, Carlos Lodeiro *El Paso TX*<sup>2</sup>, Bryson Tudor *El Paso TX*<sup>2</sup>, Alan Tyroch *El Paso TX*<sup>2</sup>, Ellen Wicker *El Paso TX*<sup>2</sup>, Stephen Moreland *El Paso TX*<sup>2</sup>, Evan Liggett *El Paso TX*<sup>2</sup>

Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Introduction:** Gastric bypass(GB) can present with internal hernias after surgery, especially at the jejunostomy defect. The defect is commonly closed with permanent suture. Permanent suture can cause problems such as stitch abscesses even after long periods. Herein we describe a case of a mesenteric abscess caused by a permanent braided suture that was used to close the

defect of the jejujejunostomy.

**Case Description:** The patient is a 39 year old female who underwent a antecolic antegastric laparoscopic GB. She had closure of the mesenteric defect with permanent suture. Two years later she subsequently developed an internal hernia at the antecolic space. She was taken back for diagnostic laparoscopy and closure of this defect. Seventeen months later she presented with a mesenteric abscess near the jejujejunostomy. She was taken to the operating room and a diagnostic laparoscopy was converted to an exploratory laparotomy. The mesenteric abscess contained a bile stained permanent braided suture. The anastomosis was resected and redone secondary to the abscess. She recovered without complications.

**Discussion:** Mesenteric abscess caused by permanent braided suture after gastric bypass has not been described. Permanent sutures have been associated with marginal ulcer in the gastric pouch of GB patients. Permanent suture is known to cause stitch abscess in skin. Barbed sutures have also been known to cause small bowel obstructions.

**Conclusion:** Permanent suture should never be used on bowel as it can cause abscess formation. When used for mesenteric defect closure, the suture should not be continued onto the bowel itself.

**A337**

### **Single Anastomosis Sleeve Ileal (SASI) Bypass: An Option For Weight Regain After Sleeve Gastrectomy**

Ibrahim Hassan *Kuwait*

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**Introduction:** -SASI Bypass is a Novel Metabolic/Bariatric Surgery operation based on Minigastric bypass and Santoro's operation. It can be offered for patients with weight regain after Sleeve gastrectomy. **Abstract:** Sleeve gastrectomy (SG) is a commonly performed bariatric procedure. Weight regain following SG is a significant issue. Yet, the understanding of this phenomenon is still unclear. Rates of regain ranged from 5.7% at 2 years to 75.6% at 6 years. SASI bypass was an option for some candidates having SG done 2 years back and failed to achieve the required weight loss or having weight regain. In SASI bypass, Resleeve gastrectomy of the dilated gastric pouch is done followed by a side to side gastro-ileal anastomosis. The aim of this study is to report the clinical results and the outcomes of SASI bypass as a therapeutic option for patients with weight regain after SG. **Methods:** -We conducted a retrospective study for 50 morbidly obese patients having history of SG done more than 2 years back and failed to achieve and/or to maintain the required BMI. **Exclusion criteria:** Patients with recent history of laparotomy (less than 12 months). Procedure was done at Sidra Hospital in Kuwait from November 2016 to November 2018. Using 5 ports, Resleeve Gastrectomy was performed over 36 fr bougie tube starting 6 cm above the pylorus then gastro-ileal anastomosis (side to side) was performed 6 cm above the pyloric ring to an ileal loop counted 250-300 cm from the ileocaecal valve. Data was collected from the patients including: Weight loss progress, laboratory full results. **-Discussion and Results:** - During the study period: 50 morbidly obese patients with a

mean BMI of 44+/-6 Kg/m<sup>2</sup> were evaluated .-%EWL(excess weight loss)reached 85% at one year.-Diabetes was cured in the 2 known diabetic patients (type2)within 6 months,and the one known type 1 diabetic patient had better control and less insulin daily doses(results were guided by glycated haemoglobin results every 3 months).-Follow up laboratory results were normal in 88% of patients (all were kept on regular vitamins and proteins supplementation )-one patient had postoperative leak(day1)from the anastomotic line that was treated conservatively. - Conclusion:-SASI Bypass is a promising operation that offers a good weight loss for morbidly obese patients having weight regain after SG.

### **A338**

#### **Quantitative Analysis of Obese Hypertensive Women and the Health Belief Model**

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Duke University

#### **Abstract**

This study utilized secondary data to understand weight-loss behaviors in obese adult women with hypertension. There are multifactorial reasons for obesity. This study attempted to clarify why people cannot lose weight. The gap in the literature relates to why the concepts such as perception of risk, benefits, and obstacles to action have not been found to cause individuals to achieve weight loss or to maintain weight loss. Secondary data were used from the NHANES dataset, a weighted dataset representative of the U.S. population. The sample used in this study included 411 obese hypertensive women over the age of 18. In all, six years of data from 2009-2014 were derived from the National Health and Nutrition Examination Survey (NHANES) dataset. Perception about the obstacles an individual confronts can be a barrier to successful weight loss. If an individual thinks success cannot be attained, efforts to lose weight will fail. Hierarchical regression analysis was used to assess the variables. The results of this secondary research indicated that only perception of weight acted as a cue to action for losing weight. That is, the perception of weight was the only statistically significant finding of reasons obese hypertensive women initiate weight loss efforts. .

### **A339**

#### **Is transdermal multivitamin patch effective in gastric bypass patients?**

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Mercy Hospital<sup>1</sup> University of Iowa Hospitals and Clinics<sup>2</sup>

Background: Laparoscopic roux-en-Y gastric bypass (LRYGB) patients are recommended to take multiple vitamin supplements daily. Transdermal multivitamin patches are being advertised for use in bariatric patients with no data to support its efficacy. The purpose of this study was to

evaluate response to daily transdermal use of multivitamin patch after LRYGB and comparing them with a control group of similar patients who used oral supplements.

Methods: A retrospective review was carried out on patients who had LRYGB at a community hospital from February 2015 to February 2019. Patients who had completed preoperative and annual postoperative bariatric laboratory tests were included. They were divided into patch and pill (control) group.

Results: 21 patients were included in the patch and 27 in the pill group. Patients in each group used either patch or pills for at least 12 months. 81% patients in patch group and 44.4% in pill group had at least 1 deficiency at annual postoperative blood work ( $P = .0051$ ). Vitamin D deficiency was seen in 80% patients in patch group versus 36% in pill group ( $P = .0032$ ). A statistically significant lower postoperative serum concentrations of Vitamin D, B1, and B12 was seen in patch group. Folate and ferritin levels were also lower in the patch group.

Conclusions: Multivitamin patch users are more likely to have vitamin D deficiency and lower serum concentration of various vitamins and minerals. Future large studies are needed on the efficacy of multivitamin patches before they can be recommended to bariatric patient population.

### **A340**

#### **RESULTS OF THE USE OF THE GLP-1 ANALOGS IN PATIENTS WITH OBESITY TYPE 1 OR REGAIN WEIGHT AFTER BARIATRIC SURGERY**

Evelyn Dorado *cali*

FUNDACION VALLE DEL LILI

#### **INTRODUCTION**

The use of GLP-1 analogues have shown very good results for lose weight with improvement in metabolic and mechanical comorbidity.

#### **AIM**

To show how the use of GLP-1 analogues together with changes in habits have a favorable effect in patients with overweight or obesity type I- II

#### **MATERIALS AND METHODS**

34 patients with overweight and obesity type I- II ,consulted at the Obesity Clinic between June 2018 and March 2019.All patients underwent interdisciplinary management with nutrition,body composition,deportologist,behavioral psychologist and Liraglutide was started at a dose of 0.6 to 3 mg sequentially.Monthly follow-up was done to evaluate results and presence of adverse symptoms.

#### **RESULTS**

The patients were distributed according to their BMI:overweight 17%, Obesity type I 64% and obesity type II 17%, 5 of them had previous bariatric surgery 2 sleeve 3 gastric bypass. adverse

effects were constipation, diarrhea, skin reaction. The treatment lasted between 3 to 6 months. The weight loss was 58% of the patients 10 kg and 42% up to 15 kg. The percentage of visceral fat lost was 10 to 20 cm and body fat between 3 to 7 kg. The follow up until now is 9 months without reganancy in which the medication is discontinued. In patients with weight reganance after bariatric surgery, emphasis was placed on alimetary measures. they loss was 15% of excess weight

## CONCLUSION

The use of pharmacological measures associated with changes in alimetary habits, directed exercise and behavioral management has been shown to be very effective in weight loss.

## A341

### **HOW DOES BODY COMPOSITION CHANGE MEASURED BY BIOIMPEDANCIOMETRY WHEN THE PATIENT LOSES WEIGHT, WHETHER WITH MEDICAL OR PHARMACOLOGICAL MANAGEMENT? PRELIMINARY RESULTS CLINIC OF OBESITY IN COLOMBIA**

Evelyn Dorado *cali*

FUNDACION VALLE DEL LILI

## INTRODUCTION

Part of the parameters to determine weight reduction are BMI and body weight. But there are more precise measurements that demonstrate adherences to patterns and changes in body composition that directly affect the metabolic behavior of certain diseases such as the measurement of visceral fat, phase angle, body fat and skeletal muscle and the measurement of the abdominal perimeter.

## AIM

Determine how body composition changes after medical and surgical management in a group of patients enrolled in the same bariatric clinic

## METHODS AND RESULTS

29 patients enrolled in obesity management at Fundacion Valle del Lili for medical and surgical treatment, is followed up for 1 year. The patients are all managed by behavioral psychology, sports medicine, nutrition, bariatric surgery and endocrinologist. Those who go to medical management is formulated liraglutide and those who go to surgical management are made sleeve or bypass without liraglutide. Pre and post follow-up of their body composition is done and the results are evaluated. 62% have BMI between 30 to 39. 70% were mainly surgical patients gastric sleeve. The measurement of body composition was at the beginning 3 and 6 months of therapy with 60% loss of 5 kg of body fat and 60% 11 to 20 cm of visceral fat, phase angle > 4.5 and decrease > 50% of the perimeter abdominal.

## CONCLUSION

A healthy body composition goes hand in hand with resolution of metabolic and mechanical comorbidities, the reduction of weight with either handling or surgery is a determining factor in quality and life expectancy.



### A342

#### **The MBSAQIP is going viral! 176 hits and still going strong.**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Introduction:** The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) first released its Participant Use Data File (PUF) in 2015. Since then, surgeons have eagerly evaluated data now available on over 450,000 patients, and we hypothesized we would see the number of publications using the PUF increase yearly.

**Methods:** A literature search was performed to identify articles published using the MBSAQIP database since 2016. PubMed, Clinical Key (both indexed for MEDLINE), and Cochrane databases were queried using the keywords “MBSAQIP” and “Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program.” Abstracts presented at ObesityWeek, SAGES, and the Clinical Congress of the ACS in 2016-2019 were also examined. Duplicates, letters to the editor, commentaries, statements, and position pieces were excluded. Articles describing projects that used MBSAQIP data to study less than five accredited centers were also excluded.

**Results:** As of March 2019, there were 114 journal articles in PubMed, 216 articles in Clinical Key, and 0 in Cochrane using our the search terms. Additionally, 184 abstracts were included from the journal supplements from ObesityWeek, SAGES, and the Clinical Congress of the ACS. After elimination of duplicates, there were 327 total articles. After exclusions, 50 published articles and 126 abstracts remained.

**Conclusion:** The MBSAQIP is a resounding success. A substantial body of research has already been produced from it and is growing with time. Gaps in current knowledge are being targeted through analyses of this single, large-scale database. The MBSAQIP will remain a game-changer in metabolic and bariatric surgery.

### A343

#### **Trends in bariatric surgery in Texas: an analysis of a statewide administrative database 2013-2017.**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Background:** The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) tracks 30 day outcomes of bariatric patients, but only at accredited centers. Presently, these cases are not broken down by state. We proposed using the inpatient and outpatient administrative databases in Texas to examine both the numbers and trends of bariatric surgery in Texas.

**Methods:** The Texas Inpatient Public Use Data File (IPUDF) and the Texas Outpatient Public Data File (OPUDF) were examined for the years 2013-2017. Patients undergoing adjustable gastric banding (AGB), sleeve gastrectomy (SG), gastric bypass (GB), duodenal switch and revisions of bariatric surgery were included.

**Results:** There were 105,199 bariatric cases performed in Texas from 2013-2017. There were 173 centers performing bariatric surgery. The most common operation performed was the sleeve gastrectomy at 73,663 cases (70% of total). Gastric bypasses were second at 22,890 cases. During this time period, AGB almost disappeared dropping from 2,090 cases in 2013 to 115 cases in 2017, with removal of 2,097 AGB in the study period in the OPUDF. There was a lower growth rate of the number of SG in the IPUDF with a large increase in SG performed with outpatient status, while GB remained relatively stable.

**Conclusions:** Rates of bariatric surgery in Texas are increasing slowly. The dominant procedure is the SG with a trend towards outpatient status. There are 90 more hospitals and surgery centers performing bariatric surgery than the 83 MBSAQIP accredited centers, calling into question the generalizability of that data.

#### A344

##### **Incidence of the internal herniation after an RYGB and the predictive ability of the CT scan as a diagnostic tool.**

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LUMC<sup>1</sup> Dutch obesity clinic West<sup>2</sup>

**Introduction:** An internal herniation (IH) is an increasingly problem. Furthermore, little is known about the added value of the computer tomography (CT) scan as a diagnostic tool.

**Objective:** To analyse the effect of the CT scan and the incidence of internal herniation.

**Method:** This is a retrospective study whereby n = 3,262 were included. CT outcomes were compared with the presence or absence of an IH. Group A is the non-closed group with a CT (N = 16). Group B is the non-closed group without CT (N = 46). Group C is the closed group with a CT (N = 36) and group D is the closed group without CT scan (N = 35).

**Results:** The incidence of IH in the primarily non-closed group (N = 1,058) was 3.9%% and in the primary closed group (N = 2,204) was 1.3% (p.0.001). Group A the sensitivity was 80%, specificity 0% of the CT scan. Group B an IH was visible in 58.7%, 41.3% not. Group C the sensitivity was 64.7%, specificity of 89.5%. Group D an IH was visible in 34.3%, 65.7% not.

**Conclusion:** The incidence of IH can be significantly reduced by closing. The diagnostic

accuracy of a CT scan to support the choice of treatment is insufficiently useful if it is not closed primarily (specificity 0%). The IH present in the groups without CT scan (58.7% and 34.3%) indicates performing a CT scan can be recommended. On the other hand, a CT scan can never rollout an IH completely.

### **A345**

#### **Outcomes of Robotic Revisional Surgery Compared to Laparoscopic Surgery: First Look at MBSAQIP**

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St Luke's University Hospital and Health Network<sup>1</sup> St Luke's<sup>2</sup>

Introduction/objective: The increased in the number of bariatric surgery cases performed resulted in a significant increase in the number of revisional bariatric surgery (RBS) to address complications and recidivism. The use of the da Vinci robotic platform considered controversial by many may offer advantages in RBS. The objective of our study is to compare the outcomes of robotic RBS (R-RBS) over Laparoscopic RBS (L-RBS)

Methods: Using the 2015-2017 MBSAQIP database we selected all RBS and we matched R-RBS to L-RBS using a propensity score matching system to create balanced groups. Our primary outcomes were 30-day severe adverse event (SAE), 30-day organ specific infection (OSI), 30-day reoperation and 30-day interventions. Our secondary outcomes included length of operation and 30-day readmission. We conducted separate Mann Whitney rank sums tests or chi square tests and fisher exact test.

Result: R-RBS and L-RBS included 220 patients each. The overall incidence of 30-day SAEs, 30-day OSIs, 30-day reoperations, 30-day interventions were lower for R-RBS (6.4%,0.9%,2.7% and 2.3% respectively) compared L-RBS (7.7%, 1.4%, 3.6% and 3.6% respectively). Subgroup analysis showed that R-RBS had a lower rate of complications for gastric bypass but not sleeve gastrectomy cases. However, 30-day readmission was higher for R-RBS compared to L-RBS (9.1% vs 6.4% respectively). None of the analyses reached statistical significance. R-RBS took significantly longer compared to L-RBS (169 min vs 138 min, P<0.05)

Conclusion: Our study shows that R-RBS has lower complication rate albeit non-significant as compared to L-RBS.

### **A346**

#### **Experience with Eso-Sponge endoscopic vacuum suction device as treatment for leakage after sleeve gastrectomy**

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Torsby Hospital

## Introduction

Staple line leakage is a feared complication after sleeve gastrectomy. The incidence in Sweden is low with approximately 0.6% (1).

## Patient and Methods

We treated a patient with a staple line leakage of the sleeve after SADI (single anastomosis) Duodenal Switch with the endoluminal vacuum therapy system for anastomosis insufficiency in the upper GI tract called "Eso-Sponge" of B. Braun. The patient was a 45 year old male with a BMI of 48 and no comorbidities.

Initial routine postoperative follow-up was normal. However, after 8 weeks he presented with an abscess cavity left subdiaphragmatically measuring 10x8 cm.

## Results

The endovacuum-system was easy to use in this patient. The system was changed 10 times with 3-5 days intervalls. Ultimately, we determined that the cavity was not getting smaller and we deemed this therapeutic attempt as failed. We proceeded subsequently with a conversion to a gastric bypass and this worked without any complication.

## Conclusion

The Eso-Sponge-System seemed to be promising in the beginning but eventually yielded no treatment success. However, good results have been published in other indications such as anastomotic leakages after esophagectomy (2).

## 1. Annual Report 2017 Swedish Obesity Registry (SOREG)

1. Heits Net al., Long-term quality of life after endovac-therapy in anastomotic leakages after esophagectomy, J Thorac Dis.2018 Jan;10(1):228-240

## A347

### **Utilizing the Preoperative Psychological Evaluation to Determine Psychosocial Risk Factors for CPAP Non-Adherence Among Bariatric Surgery Candidates**

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Kent State University<sup>1</sup> Cleveland Clinic<sup>2</sup>

*Background:* OSA is prevalent among bariatric surgery candidates and is associated with numerous adverse health conditions both pre- and postoperatively. CPAP is the first-line treatment for OSA, but requires significant behavioral changes. As such, CPAP adherence is a significant problem in OSA treatment. Information from the preoperative psychological evaluation may be utilized to identify psychosocial risk factors associated with CPAP non-adherence and inform the implementation of more specific and appropriate interventions.

*Objectives:* Examine the utility of MMPI-2-RF scores to determine personality and psychopathology associations with, and risk for, CPAP non-adherence.

*Methods:* Patients who underwent a preoperative psychological evaluation and were diagnosed

with OSA were divided into two groups: CPAP adherent and CPAP non-adherent. Independent samples t-tests were computed to examine differences in average MMPI-2-RF scale scores between these groups. Relative Risk Ratios (RRRs) were computed using multiple MMPI-2-RF substantive scale score cut-offs to determine which MMPI-2-RF scales predicted increase risk of CPAP non-adherence.

*Results:* Higher scores on scales measuring emotional/internalizing dysfunction, behavioral/externalizing dysfunction, thought dysfunction, somatic/cognitive dysfunction, and interpersonal dysfunction were associated with and indicative of risk for CPAP non-adherence.

*Conclusions:* CPAP non-adherence may be related to and impacted by generally higher levels of psychosocial symptoms. Utilizing a broadband measure of personality and psychopathology, like the MMPI-2-RF, during the preoperative evaluation can provide important information about comorbid symptoms that may interfere with CPAP adherence. Considering this information during preoperative treatment planning could increase the likelihood of preoperative CPAP adherence and reduce the likelihood of adverse postoperative outcomes.

#### A348

##### **Price Transparency is a customer service opportunity in bariatric surgery**

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Pacific Heights Plastic Surgery<sup>1</sup> Georgia SurgiCare and Augusta University<sup>2</sup>

**Background:** The healthcare industry has shunned price transparency in the past for several reasons including the fear that patients would price shop rather than focus on the doctor patient relationship and also because of the complexity of insurance reimbursement vs out of pocket costs.

**Methods:** A procedure pricing ‘widget’ containing a list of offered services was embedded in each of the author’s private practice websites. Prospective patients browsed procedures of interest, adding them to personal “wishlists.” After supplying their name, email address and phone number, patients received emails containing a breakdown of estimated costs including surgeon’s fee, OR/anesthesia fees, implants and other ancillary fees. The physician received similar emails containing patient contact information.

**Results:** Over the course of a year, 208 prospective patients submitted "wishlists" to check pricing and 17.8% came in for a consultation. Of those, 62.2% booked procedures. Based on the statistical data when comparing price-aware consultations to non price-aware consultations, price-aware consultations were 41% more likely to book a procedure than non price-aware consultations. Several patients wrote 5-star online reviews explicitly stating that they chose the practice because pricing was available.

**Conclusions:** By using this interactive pricing platform instead of a static webpage, the consumer learns the costs of various procedures while the doctor captures patient contact information. And because it is rare for most clinicians to offer online, actionable, automated pricing information, this is a major customer service opportunity to separate the physician from

their competition in the eyes of the consumer.

#### **A349**

##### **Do psychotherapeutic interventions improve maladaptive eating behaviors in bariatric surgery patients? A systematic review**

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*Background:* Maladaptive eating behaviors (MEB) are highly prevalent among bariatric surgery patients leading to weight regain. Psychotherapy has shown inconsistent results. A systematic review was conducted to evaluate the effectiveness of pre or postoperative psychotherapeutic interventions on MEB pre or post-bariatric surgery.

*Methods:* The study was registered in PROSPERO. A comprehensive literature review was performed in the databases PubMed, ScienceDirect, Cochrane Library, and Web of Science. We included all the studies with pre or postoperative psychotherapeutic interventions in bariatric surgery patients aimed to improve MEB.

*Results:* 14 studies met the inclusion criteria (7 RCT and 7 pre-posttest). A total of 691 participants were identified, 81% female and the average participant's age was of 47.1 (SD ± 6.0). Follow-up period after intervention ranged from 6 weeks to 38 months. Five out of seven RCT reported a positive and significant effect ( $p < 0.05$ ) on MEB with psychotherapeutic interventions compared with the control group. Six out of seven pre-post-test studies reported significant difference ( $p < 0.05$ ) on MEB after receiving psychotherapeutic interventions. Although weight loss was reported in all studies that included weight measure, four (44%) out of nine studies reported significant weight loss difference. Overall, quality of the evidence ranged from low to moderate.

*Conclusion:* Psychotherapeutic interventions in bariatric surgery patients are inconsistent, though most results indicate improvement on MEB. Significant positive effect on weight loss was reported in 44% of the studies. Well-designed long-term studies and other approach strategies are warranted to assess long-term effect on MEB and weight loss in bariatric surgery patients.

#### **A350**

##### **Macrophage of adipose tissue inhibited adipocyte differentiation via Fas signaling reducing Akt in obesity**

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**Backgrounds:** The obesity epidemic has forced efforts to understand the mechanisms controlling adipocytes differentiation and adipose tissue development. Adipose tissue, primarily composed of mature adipocytes and stromal vascular fraction (SVF) cells, goes through a series of changes in its quantity and composition during the onset and development of obesity and plays a key role in maintaining both whole body energy homeostasis and endocrine function. Adipose tissue macrophages (ATMs) accumulation has been reported to participate in inflammatory pathways that are activated in adipose tissues of obese individual. This study was designed to understand the roles that SVF cells and ATMs play in adipogenic differentiation and explore its detailed signal transduction mechanisms.

**Methods:** Obese mice model were established by high-fat diet. We purified the SVF derived from adipose tissue of obese or lean mice and CD11b<sup>+</sup>, which presented macrophage. The SVF and ATMs were used to stimulate 3T3-L1 preadipocyte differentiation. Immunoblotting and real-time PCR were conducted to assess the expression of genes and protein involved in differentiation of adipocytes. Oil red O staining were used to observe directly the differentiation degree.

**Results:** SVF cells and ATMs of obese mice inhibited adipocyte differentiation. The expression of FasL on ATMs increased in obese mice. Fas signaling inhibited the adipocytes difference by reducing Akt and deficiency of Fas/FasL pathway attenuates the inhibition of ATMs on adipocyte differentiation

**Conclusion:** Macrophage of adipose tissue from obese mice inhibits adipocyte differentiation through Fas signaling down regulating on Akt.

## A351

### Post-operative Hemorrhage after Laparoscopic Sleeve Gastrectomy: A Quality Improvement Project

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#### Introduction

Post-operative hemorrhage impacts patient morbidity, mortality, and utilization of resources. Predicted rate of post-operative hemorrhage after sleeve gastrectomy is 2-5% with an expected re-operative rate of 1-3%. Most hospitals consider these events avoidable and have implemented strategies to improve outcomes.

#### Aim

To examine sleeve gastrectomy patients with acute post-operative anemia resulting from hemorrhage.

## Method

Data collection included patients from MBSAQIP data registry who underwent laparoscopic or robotic sleeve gastrectomy from January 2016 to December 2018. Data analyzed included pertinent medical history, use of any anti-platelet agents, NSAIDs, anti-coagulants, pre-operative endoscopic findings, length of time from surgery to identification of symptoms and clinical presentation mode.

## Result

801 procedures were performed. 6 patients, 4 females and 2 males experienced *clinically significant* post-operative hemorrhage requiring blood transfusions and/or returned to the operating room. Mean age was 50 and mean BMI 46. Identified risk factors included former smoker (33%), anti-platelet/anti-coagulant use (16%), prior GI bleed (16%), erosive gastritis (16%). Mean length of time from surgery to identification of symptoms was 13 hours. Clinical presentation included hypotension (50%), tachycardia (33%), and abdominal pain (33%). 4 patients returned to the OR including one 30-day re-admission. In 75% of re-operations an intra-abdominal hematoma of *unclear* etiology was evacuated and in 25%, obvious bleeding at the staple-line requiring remediation.

## Conclusion

Given the relatively low rate of events and unclear sources, it was difficult to draw statistically significant conclusions if events could have been prevented. However, an association was seen with smoking status, anti-platelet usage and endoscopic findings.

## A352

### Two-year Outcomes after Implementation of an Enhanced Recovery Protocol for Bariatric Surgery

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Background: Sleeve Gastrectomy is currently the most commonly performed bariatric surgical procedure in the US. Enhanced Recovery after Surgery (ERAS) Pathways have been successfully used in colorectal surgery with improved overall outcomes. ASMBS released a sleeve specific enhanced recovery pathway (ENERGY) for limited participation.

Methodology: A Bariatric-specific ERAS Protocol was implemented at our institution on October 2016. Using our MBSAQIP institution-specific database, we compared the early (30-day) outcomes of all patients who underwent sleeve gastrectomy at our hospital before and after implementation of a Bariatric-specific ERAS Protocol. Readmission data was also compared to the entire MBSAQIP database.

Results: All patients who underwent sleeve gastrectomy since creation of the MBSAQIP



database in 2012 were included in this analysis. Data was prospectively collected using the MBSAQIP database and retrospectively analyzed. ERAS patients were defined as having undergone surgery from October 2012 onwards. 30-day follow-up was completed in all patients. All procedures were completed laparoscopically or robotically. Demographics and comorbidities were comparable between the three groups. Average LOS pre-ERAS was 1.66 days and 1.44 days post-ERAS. Readmissions rates were 0.03 and 0.06 respectively. MBSAQIP readmission rates were 0.03.

Conclusion: Despite already having low length of stay and readmission rates, implementation of a bariatric-specific ERAS Protocol resulted in further improving the length of stay with no change in readmission rates at an MBSAQIP Comprehensive Center. Further studies need to be performed to determine the optimal ERAS components in patients undergoing minimally invasive sleeve gastrectomy.

### A353

#### **Intuitive Eating Predicts Healthier Relationship with Food in Post-Surgical Bariatric Patients**

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**Background:** Intuitive eating (IE) is defined as eating based on internal hunger/fullness cues and satisfaction vs. external rules. In behavioral weight management and eating disorder treatment, IE has proven useful in reducing disordered eating and improving physical and emotional health. This study explored the relationship between IE and emotional eating, satisfaction, and self-efficacy in post-surgical bariatric patients.

**Methods:** Patients in an online bariatric support group completed the Intuitive Eating Scale-2, Emotional Overeating Questionnaire, and a questionnaire designed for this study. Data were analyzed using linear regression. 90 participants (77.8% female, 90.0% Caucasian, ages 27-74, BMI 23-52) completed the questionnaire. Most participants (40.7%) were 3-11 months post-surgery (range: <3 months - 5+ years).

**Results:** Higher IE scores were directly associated with satisfaction from meals ( $p = .03$ ), mindful eating ( $p = .02$ ), self-efficacy in maintaining eating behaviors long-term ( $p < .0001$ ), feeling in control of eating ( $p < .0001$ ), having a positive relationship with eating ( $p < .0001$ ), use of relaxation ( $p = .04$ ), and regular exercise ( $p = 0.002$ ). IE was inversely associated with emotional eating ( $p < .0001$ ), fear of weight regain ( $p < .0001$ ), stress ( $p = .01$ ), and tendency to prioritize others' needs before one's own ( $p = .002$ ). Unexpectedly, IE was not significantly associated with diet variety nor determining portions based on hunger/fullness levels.

**Conclusion:** Bariatric patients who embody IE principles feel more in control of their eating and confident about maintaining behaviors long-term. IE principles can be adapted for bariatric populations and integrated into pre- and post-surgical counseling.

**A354**

**Investigating weight-related outcomes following Laparoscopic Roux-en-Y Gastric Bypass utilizing the ACS MBSAQIP**

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Anne Arundel Medical Center<sup>1</sup>

**Background**

Laparoscopic gastric sleeve banding is well-documented as capable of significant and sustained weight loss. We present a query of national bariatric surgery data investigating potential differences in surgical outcomes of laparoscopic Roux-en-Y gastric bypass (LRYGB) by obesity class.

**Methods**

Patients were identified from the 2016 American College of Surgeons Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (ACS-MBSAQIP). Laparoscopic Roux-en-Y gastric bypass was identified based on Current Procedure Terminology (CPT) codes 43644 and 43645. Patients were subdivided according to the Centers for Disease Control and Prevention obesity classifications including underweight (BMI<18.5), normal weight (BMI 18.5-25), overweight (BMI 25-30), and obese classes 1-3 (BMI >30). Post-operative outcomes were compared between BMI groups with T test and chi squared analyses.

**Results**

135,361 patients (underweight n=13, normal n=215, overweight n=614, obese n=134,519) were identified. Gastroesophageal reflux disease was more pronounced among overweight patients however prevalence of diabetes directly correlated with increasing obesity. Surgical procedures were statistically longer among normal weight and overweight patients and transfusion was more often reported among underweight and normal weight individuals. ICU admission, readmission, and reoperation were reported inversely to increasing BMI.

**Conclusions**

Our findings represent the first study investigating 2016 ACS MBSAQIP database for laparoscopic Roux-en-Y gastric bypass outcomes by patient weight class. While greater technical demands were evidenced among the increasingly obese, the most challenging postoperative courses were seen among the underweight and normal weight cohorts. Bariatric surgeons should include this information in their preoperative candidate selection and counseling for weight-sparing surgery.

**A355**

**Studies on the changes of nutrients after bariatric/metabolic surgery**

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**Purpose:** Bariatric/metabolic surgery (BMS) can lead to several nutritional deficiencies and can worsen pre-existing ones. The aim of this study was to analyze the changes of nutrients before and after BMS in Korean patients.

**Methods:** This study included patients who underwent adjustable gastric banding (AGB), sleeve gastrectomy (SG), and Roux-en Y gastric bypass (RYGB) via laparoscopy in a single institution in Korea, followed up for at least one year. The blood test values of nutrients including iron, calcium, vitamin D, Vitamin B1/B12, folic acid, magnesium, and albumin before and after BMS were compared and analyzed by period and operation types.

**Results:** From January 2013 to December 2017, 302 patients (F:M=256:46) with a mean age of 34.1±8.3 years and a preoperative BMI of 35.3±5.7 kg/m<sup>2</sup>. As a result of analysis by period, hemoglobin (Hb) (14.1±1.4 vs. 13.3±1.3, p<0.001), Vitamin B1 (146.1±36.1 vs. 126.6±40.8, p=0.002), Vitamin B12 (574.5±387.4 vs. 461.8±176.9, p<0.001), and albumin (4.5±0.4 vs. 4.4±0.3, p<0.001) decreased significantly at 12<sup>th</sup> month. Meanwhile, there were no significant differences according to three operation types at 12<sup>th</sup> month. In the case of AGB, Hb, iron, vitamin B1, and magnesium were decreased, and decrease of Hb, and vitamin B1/B12 in SG, and decrease of vitamin B12 in RYGB were observed at 12<sup>th</sup> month compared with before surgery.

**Conclusion:** In conclusion, regular screening and supplementation of these nutrients are required after SG, RY, as well as after AGB. Further long-term follow-up results are needed to provide a strong evidence-based guideline tailored to Eastern post-bariatric patients.

### A356

#### **Emotional eating has a negative influence on excess weight loss 2 years after Roux-en-Y gastric bypass**

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Maxima Medical Center<sup>1</sup> Tilburg University<sup>2</sup>

**Background:** 20-30% of patients after Roux-en-Y gastric bypass (RYGB) fail to lose a significant amount of excess weight loss (EWL) or regain weight after ≥50% EWL. Eating disorders have been postulated as one of the factors responsible for this non-response. The effect of pre-operative “emotional eating” on weight loss has not been investigated.

**Objective:** the current study examined the predictive value of preoperative emotional eating on %EWL 2 years after RYGB.

**Methods:** retrospective clinical data of 172 patients who underwent RYGB at the Máxima Medical Centre preceded by psychological screening were analysed. Anthropometric, demographic and biological data were derived from the electronic patient register. The psychological variables were derived from the Symptom Checklist-90 (SCL-90); the level of emotional eating was derived from the Dutch Eating Behavior Questionnaire (DEBQ). Multiple linear regression analyses were performed.

**Results (preliminary):** baseline characteristics: females (83%), mean age 45 years (SD = 10.24; range 20-66), mean %EWL was 82.4% (SD = 20.56; range 37-140). Emotional eating, in

response to diffuse emotions, was negatively associated with %EWL when corrected for psychological, demographic and biological predictors ( $\beta = -0.16$ ,  $p = 0.048$ , 95% CI -1.57, -0.01).

**Conclusion:** patients with emotional eating are at risk for non-response 2 years after RYGB. Preoperative psychosocial screening is advised for early detection and treatment of emotional eating.

### A357

#### **Perioperative cost differences between laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass: a single institutional analysis**

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University of Wisconsin<sup>1</sup>

**Introduction:** Bariatric surgery is the most cost-effective treatment for severe obesity, but cost differences exist for the two most common bariatric procedures: laparoscopic sleeve gastrectomy (LSG) and Roux-en-Y gastric bypass (RYGB). The objective of this study was to compare perioperative costs between LSG and RYGB patients.

**Methods:** Adult bariatric surgery patients who underwent either LSG or RYGB from 2012-2017 were identified using our institution's bariatric surgery database. Perioperative costs (defined as costs incurred on the day of surgery) were obtained for all patients through billing data and classified into 10 different categories. Median costs between LSG and RYGB were compared using Mann-Whitney tests.

**Results:** We included 546 bariatric surgery patients in the study cohort. There was no significant difference in the total median cost of LSG compared to RYGB (\$14,942 vs. \$15,016;  $p=0.80$ ). RYGB patients had higher operating room time costs (\$1,589 vs. \$1,394;  $p<0.01$ ), while LSG patients incurred higher costs related to bloodwork/pathology (\$178 vs. \$108;  $p<0.01$ ). "Staplers and staple line reinforcement" was the highest cost category for both procedures (\$4,147 and \$4,388 for LSG and RYGB, respectively) (**Table**).

**Conclusions:** In our single institution study, perioperative cost differences between LSG and RYGB were relatively small, with no differences in total costs between the two procedures. Reducing costs outside of the operating room, such as those related to emergency department visits and readmissions, may be more impactful than focusing on costs related to operative care.

### A358

#### **Indications and Efficacy of intragastric balloon in Obese Egyptian Patients**

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Alexandria Faculty of Medicine, Egypt

**Background:** Intra-gastric balloon was described to be effective in weight reduction, and is used as a bridge before bariatric surgery. **Objective:** To present the efficacy as a weight reduction tool in obese Egyptian patients. **Methods:** A retrospective review of a prospectively maintained bariatric database was conducted. Indications of Intra-gastric balloon, initial weight, weight loss and complications data were analyzed. Statistical analysis was conducted via SPSS version 16. **Results:** 255 patients' records (61 males and 194 females) were retrieved. Mean initial BMI was  $48.2 \pm 21$  kg/m<sup>2</sup>. The mean of excess body weight percent (EBW %) was  $105.1 \pm 41.3$  % for females and  $129 \pm 50.8$  % for males. Nausea was reported in 130 patients (51 %), epigastric discomfort was reported in 163 patients (63.9 %), and vomiting was reported in 127 patients (49.8 %). Twenty four patients (9.4 %) had early removal of the balloon (before six months), while eight (3.1 %) had delayed removal. The mean excess weight loss % (EWL %) was 17.2 %. There was significant reduction in patients' BMI from 45.3 to 38.3 kg/m<sup>2</sup> ( $p < 0.001$ ). There was no significant association between the EWL % and the gender, age or initial BMI. Two patients had second balloon insertions without complications. **Conclusion:** Intra-gastric balloon is effective and safe in weight reduction in obese Egyptian patients.

### A359

#### **A long term result of plication among obese Egyptians patients, standardization is needed**

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**Introduction:** Laparoscopic greater curvature plication LGCP is an operation that is gaining ground in the treatment of morbid obesity especially in low economic countries. It appears to replicate the results of laparoscopic sleeve gastrectomy with cheap equipments and fewer complications. **Objective:** Review of current literature, especially results on weight loss and complications. Follow up of all plication cases done in Alexandria Egypt; 82 cases in a period between 1998 & 2002 including Basic BMI, percentage of excess body weight lost & long term maintain of weight loss. **Results:** A wide variety of techniques regarding number of rows, type of suture material and suture techniques had been reported. Initial data show that LGCP is effective for short- and medium-term weight loss, complication and reoperation rates are low, and GERD symptoms are unaffected. More data is required, and randomized control trials must be completed in order to reach safe conclusions. **Conclusion:** Standardize the technique of the procedure to be able to compare it in prospective manner with sleeve & bypass operation is needed.

### A360

#### **Laparoscopic Roux-en-Y Gastric Bypass Equipoise Laparoscopic Sleeve Gastrectomy for Teenagers with severe obesity: a Study Protocol for an RCT (TEEN-BEST)**

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*Background:* Recent data support the use of bariatric surgery in adolescents with severe obesity not responding adequately to multimodal lifestyle intervention programs. Although both sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) have demonstrated successful weight loss and reduction of comorbidities, long-term outcome data of SG in adolescents are limited. No randomized controlled trial (RCT) comparing the two procedures has been performed in adolescents.

*Objective:* Determine whether SG is non-inferior to RYGB in terms of total body weight (TBW) loss in adolescents with severe obesity.

*Methods:* A multicenter international randomized controlled non-inferiority trial. 264 adolescents aged 13-17 (Tanner stage  $\geq$ IV) with severe obesity (corrected for age and sex) will be included. Adolescents agreeing to participate will be randomized to either RYGB or SG. The primary outcome is the proportion of participants achieving 20% TBW loss at three years postoperatively. However, follow up will extend into the long term. Secondary outcomes include (i) change in body weight and body mass index, (ii) incidence of adverse health events and need for additional surgical intervention, (iii) resolution of obesity-related comorbidities, (iv) prevalence of cardio metabolic risk factor measures, (v) bone health measures, (vi) quality of life, including psychosocial health, patient satisfaction and educational attainment and (vii) body composition.

*Results:* Not applicable.

*Conclusion:* This study will be the first RCT comparing SG and RYGB in adolescents with severe obesity, and will guide future decisions regarding preferred technique in adolescents.

### **A361**

#### **Pregnancy After Roux-en-Y Gastric Bypass Surgery Complicated by Invagination; Five Case Reports and Systematic Review of the Literature.**

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Máxima Medical Center<sup>1</sup>

*Background:* Invagination of the small intestine during pregnancy in women with a history of laparoscopic Roux-en-Y Gastric Bypass (LRYGB) can cause maternal and foetal morbidity and even foetal mortality.

*Objective:* Aim of this study is to describe the characteristics of invagination during pregnancy after LRYGB, the surgical treatment and the maternal and foetal outcomes.

*Methods:* MEDLINE®, Embase, Cochrane Library and our own hospital's electronics health records were searched for studies/cases regarding 1) pregnant patient(s) with a history of LRYGB and 2) pregnancy(ies) complicated by invagination. Our hospital has a nationwide referral function for bariatric related pregnancy emergencies.

Results: Fifteen papers were eligible, containing seventeen cases. Our hospital search included five cases. Median age was 32 (28, 35) years, median gestational age was 26<sup>+6</sup> (17<sup>+0</sup>, 31<sup>+3</sup>) weeks. Median timeframe between LRYGB and onset of symptoms was 4 (2, 7) years. At least 17/22 invaginations were retrograde and at least 15/22 of the invaginations were located at the jejunojejunostomy. Five patients were treated with manual reduction of the invagination, one patient had manual reduction but needed surgical resection due to ischemia. Sixteen patients had surgical resection with revision of the jejunojejunostomy. One foetal death (one of twins) was reported due to necrotising enterocolitis.

Conclusion: Invagination, mostly retrograde and located at the jejunojejunostomy, can be the cause of acute abdominal pain in pregnant patients with a history of LRYGB. Surgical resection seems the preferable treatment. Awareness of this complication and timely diagnosis and treatment is necessary to improve maternal and foetal outcomes.

### A362

#### **Late post operative splenic Bleeding after laparoscopic sleeve gastrectomy: Case report**

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The risk of postoperative bleeding after laparoscopic sleeve gastrectomy (LSG) has been reported to be between 1% and 6%. Most of them occur in the early post operative period. The bleeding may be intra or extraluminal. Late post operative splenic bleeding is rare and not described in the literature. Here we present a case report with massive late post operative splenic bleeding 10 days post routine LSG. We present a 45 years old morbidly obese female patient with BMI 42 without comorbidities underwent LSG. The operative and post operative course were uneventful with a stable hemodynamic state and CBC. The patient was discharged at POD2 feeling well with a prophylactic anticoagulation. In POD 10 she was admitted emergently to the emergency room (ER) with a clinical presentation of severe abdominal pain with a stable hemodynamic state. The patient underwent CT which revealed a massive active bleeding from the spleen. But after a short time she developed signs of hypovolemic shock and was taken emergently to the operation room. In the operation there was a huge ruptured sub capsular splenic hematoma, a splenectomy was performed. In POD 4 the patient developed pulmonary embolism and was discharged in POD 7. Our review of literature examines this diagnosis is extremely rare.

### A363

#### **Additive effects of a 11-months multicomponent exercise program on cardiometabolic risk factors following bariatric surgery**

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**Purpose:** Bariatric surgery (BS) and exercise have beneficial cardiometabolic effects, however, it remains undetermined if exercise post-BS achieves additional benefits. Our aim was to investigate the additive effect of exercise and BS on cardiometabolic health.

**Methods:** Sixty-two patients with obesity ( $43.8 \pm 10.6$  years;  $45.2 \pm 5.6$  Kg.m<sup>-2</sup>; 86% female) were recruited and one-month after BS (68% RYGB; 32% Sleeve) were randomized to control (CON, n=23; standard medical care) or exercise groups (EX, n=39; 11-months multicomponent exercise, 75min/day; 3day/week, plus standard medical care). Hemogram and biochemistry (liver enzymes, total cholesterol, LDL, HDL, triglycerides, fasting glucose, HbA1c, insulin, C-peptide, uric acid and hs-CRP) were analyzed before, 6 and 12-months after BS and clinical assessment (weight, blood pressure, waist circumference and resting heart rate) was performed at 1, 6 and 12-months after surgery. Intention-to-treat analysis was performed.

**Results:** 12-months after BS both groups decreased significantly body weight (CON -29%, EX -30%), waist circumference (CON -21%, EX -23%), insulin (CON -68%, EX -80%), c-peptide (CON -53%, EX -52%), glucose (CON -25%, EX -19%), HbA1c (CON -15%, EX -9%), triglycerides (CON -38%, EX -34%), uric acid (CON -29%, EX -13%) and leucocyte count (CON 22%, EX 20%). Significant decreases in total cholesterol (-24%), LDL (-32%) diastolic blood pressure (-12%) and Framingham score for CHD (-84%) were only observed in CON. Significant decreases in hs-CRP were only identified in EX (-83%). Two-way ANOVA showed no significant treatment\*time interaction effect for any of the variables.

**Conclusion:** Overall, a multicomponent exercise program was unable to provide additional improvements in cardiometabolic health compared with BS alone.

### A364

#### **Suicidal Risks in Adolescents Following Bariatric Surgery**

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**Background.** Elevated suicidal risk for adult bariatric patients is concerning. Adolescence and young adulthood (AYA) are high risk periods for suicidal thoughts and behaviors (STBs). Understanding how STBs and associated risk factors unfold for adolescents following bariatric surgery is critical to inform care guidelines. **Method.** Utilizing a multi-site prospective observational controlled design, adolescents undergoing bariatric surgery (n=153;  $M_{age}=17$ ;  $M_{BMI}=52$ , 79% female; 65% White) and nonsurgical comparators (n=70;  $M_{age}=16$ ;  $M_{BMI}=47$ , 80% female; 54% White) completed standardized assessments with psychometrically sound measures and safety follow-up at presurgery/baseline, Year 2, and Year 4 postsurgery, with 117 surgical ( $M_{BMI}=38$ ) and 56 comparators ( $M_{BMI}=48$ ) at Year 4. **Results.** Groups did not significantly differ on a composite of postsurgery STBs at Year 4 (PostSTBs: past year ideation/plan/attempt, past-month ideation, any attempt: n=18 surgical [16%], 10 [18%] nonsurgical; OR=0.95, p=0.90). Surgical group predictors/correlates of PostSTBs were consistent with broader suicide and AYA literatures (e.g., depressive symptoms,



victimization, dysregulation, drug/alcohol use) as opposed to surgery-specific factors (e.g., % weight loss, weight satisfaction, procedure). Of those with an attempt history (lifetime), only a minority (4/13 surgical, 3/9 comparators) reported a first attempt during the four year study period (i.e. postsurgery). Of 3 decedents (2 surgical, 1 comparator), none were confirmed suicides. **Conclusions:** Suicide risk reduction is a public health priority for AYAs. While bariatric surgery in adolescents does not appear to increase (or lessen) risk of engaging in postsurgery STBs to Year 4, suicide risks remain in a subgroup with poorer psychosocial health. Longer-term follow-up and controlled outcome studies are needed and ongoing.

### A365

#### **Can machine learning be applied to notify the multidisciplinary bariatric surgery team of patient problems before they happen? A proof-of-concept proposal to optimize clinical outcomes**

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Brown University/The Miriam Hospital<sup>1</sup>

Bariatric surgery produces clinically significant weight loss and improved cardiovascular health. However, outcomes are heterogeneous, and up to 30% of patients experience significant weight regain and associated negative health outcomes. Machine learning can accurately predict post-bariatric weight loss success, but methods to integrate such models into clinical practice have yet to be explored. In this presentation, we first describe potential utility of a system that can predict and notify medical providers of patients at risk for poor weight outcomes post-bariatric surgery. Next, as a proof-of-concept example, we summarize successful use of outcome prediction for another patient population exhibiting heterogeneous treatment response—patients with eating disorders (EDs). The analysis applied trajectory modeling and machine learning to predict symptom outcomes among patients receiving ED treatment ( $N=343$ ). In this sample, three distinct treatment response patterns were identified using latent growth mixture modeling (Gradual Improvement, Rapid Improvement, or No Improvement). Support vector machine learning was then applied to predict outcomes using only early treatment response data. Results yielded 84.1% prediction accuracy (95% CI [72.7, 92.1]). Using this model, information on a patient's expected ED treatment response pattern can be used in clinical practice to individualize patient care. We discuss how to apply a similar modeling approach for weight outcomes among patients who have undergone bariatric surgery. We specifically propose a system to notify medical providers of risk for poor outcome *before* it occurs, allowing for early intervention and prevention of weight regain.

### A366

#### **Efficacy of methylene blue in detecting spontaneous intragastric balloon deflation. Diab AF, Diab FH**

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#### Introduction:

Spontaneous intragastric balloon deflation occurs in around 0.9% of patients, with the risk of migration and potential bowel obstruction. Methylene blue is routinely added to the fluid filled balloon to help in early detection of balloon deflation prompting the patients to seek medical advice. There is a paucity of studies looking at the efficacy of methylene blue.

#### Methods:

From 06/2013 to 12/2017, 845 patients underwent insertion of the fluid filled Orbera intragastric balloon by 5 gastroenterologists at Khaldi Medical Center in Amman Jordan. 10cc of methylene blue was added to the fluid filled balloon in all cases. Patients who had spontaneous balloon deflation were interviewed and were asked if they noticed green urine staining at any time after balloon insertion.

#### Results:

845 patients were reviewed, 53 were lost to follow-up, and 15 had early balloon removal due to intolerance.

7 out of 782 patients (0.9%) were found to have spontaneous balloon deflation during endoscopy at 6 months. 5 migrated from the body undetected, while 2 were found deflated in the stomach. None had bowel obstruction or abdominal pain or noticed any urine discoloration.

#### Conclusions:

The routine use of methylene blue was not effective in detecting early balloon deflation, this may be related to several factors including the concentration of the dye in the fluid, the rate of balloon leakage, and patients' education regarding the monitoring of urine color during intragastric balloon therapy.

### **A367**

#### **Improvement of type II diabetes mellitus after laparoscopic Roux-en-Y gastric bypass and laparoscopic sleeve gastrectomy from a single centre**

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Changi General Hospital<sup>1</sup>

#### Background

Laparoscopic Roux-en-Y gastric bypass (LRYGB) and laparoscopic sleeve gastrectomy (LSG) were performed for morbid obesity since 2011 and 2008 respectively. This study compared the medium-term weight and metabolic changes after surgery.

#### Methods

A prospectively maintained database of bariatric surgical procedures was analysed in April 2019.

LRYGB and LSG performed more than 12 months prior were included. Weight and metabolic changes after surgery were analysed.

### Results

Thirty-six LRYGB and 113 LSG procedures were performed. Mean age was 42.5 $\pm$ 8.3 versus 40.0 $\pm$ 10.6 and mean BMI 43.2 $\pm$ 7.5 versus 46.7 $\pm$ 9.4 kg/m<sup>2</sup>, respectively. Mean excess weight loss peaked at 66.9% 18 months after LRYGB and 52.1% 24 months after LSG. Twenty-eight (78%) of LRYGB and 37 (33%) of LSG patients had type II diabetes mellitus (T2DM) for mean duration of 4.9 and 1.2 years, respectively. Of these, 16 (57%) of LRYGB and 21 (57%) of LSG patients had complete remission, while a further 11 (39%) LRYGB and 5(14%) LSG patients had improvement or partial remission. One LRYGB and 2 LSG patients had recurrence of T2DM after complete remission. For LRYGB patients, mean HbA1c consistently reduced by > 2 percentage points compared to pre-operatively over the entire follow-up period (greatest reduction in mean HbA1c of 3.2 percentage points at 24 months). For LSG patients, the greatest reduction in mean HbA1c was 2.5 percentage points at 9 months, and < 2 percentage points at all other time points over 10 years.

### Conclusion

LRYGB, compared with LSG, achieved higher excess weight loss and more prolonged improvement of T2DM.

## A368

### **Postoperative Osteopathic Manipulative Treatment in Bariatric Surgery: A Prospective Randomized, Group Controlled Study**

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Flushing Hospital Medical Center<sup>1</sup>

### Background

Pain control is one of the most challenging problems encountered in postoperative period in bariatric surgery patients. Osteopathic Manipulative Treatment (OMT) is considered as a potential cost-effective adjunct. Currently, there is no published data evaluating the effect of OMT on postoperative pain in bariatric surgery patients.

### Objective

The primary objective of this study is to determine whether combination of Osteopathic Manipulative Treatment (OMT) with standard postoperative regimen can decrease postoperative morphine equivalents requirements in 24 hours. The secondary outcomes were pain scores and hospital length of stay.

Design: A single center prospective randomized, group controlled study. This study has been registered at ClinicalTrials.gov (ID: NCT03833011).

Setting: A 293-bed teaching hospital.

## Methods

49 patients underwent laparoscopic sleeve gastrectomy from January 2017 to August 2018 were included into study and randomized to receive either a single session of OMT administered postoperatively and Morphine PCA (n=24) vs Morphine PCA only (n=25). Total parenteral morphine equivalents (PME), pain scores within 24 h postoperatively and length of stay (LOS) were analyzed.

## Results

There was less opioid consumption in OMT group  $26.9 \pm 16.4$ mg compared to Control  $35.1 \pm 23.4$ mg, but it was not statistically significant ( $p=0.17$ ). There was no difference in pain scores ( $p=0.32$ ) or median LOS ( $p=0.48$ ).

## Conclusion

This is the first prospective randomized study evaluating OMT as adjunct to reduce postoperative pain after laparoscopic sleeve gastrectomy. Although our study showed less opioid consumption in intervention group, it was not statistically significant. Further studies with larger sample size may show significant reduction in opioid consumption.

## A369

### **Cellular reprogramming of human primary adipocytes into brown adipose tissue (BAT)-like cells results in enhanced glycolysis**

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Miami University<sup>1</sup> Miami University<sup>2</sup>

**Objective:** To examine the molecular mechanism of cellular reprogramming of primary human adipocyte cells into Brown Adipose Tissue (BAT)-like cells.

**Methods:** Previous results from our lab have demonstrated lipid-accumulation, lack of cellular proliferation, stimulation of genes involved in the BAT pathway and increased number of mitochondria when heparin binding EGF-like growth factor (HB-EGF) and a soluble form of a disintegrin and metalloproteinase 12 (ADAM 12S) were co-transfected in cells. HB-EGF and ADAM 12S adenoviral expression vectors were engineered in order to recapitulate these results with the goal of using these vectors *in vivo* and *in vitro*. Human primary adipocytes were infected with either mock or ADAM 12S high titer adenovirus, monitored for fluorescence, lipid accumulation, and RNA was extracted after three weeks of infection. Gene expression patterns were examined using qRT-PCR for the canonical BAT genes, PRDM16, PGC-1 $\alpha$ , and UCP-1. Metabolic analysis for functionality of BAT-like cells was determined using a Seahorse XF24 analyzer.

**Results:** Infection of the primary human adipocyte cells was confirmed by the presence of enhanced green fluorescent protein. Both the mock infected and the ADAM 12S adenovirus infected cells exhibited fluorescence. The ADAM 12S infected cells demonstrated noticeable lipid droplet accumulation in comparison to the mock infected cells. This was confirmed by significant and specific Oil Red O staining in Ad-ADAM 12S infected cells, indicating the accumulation of oil droplets. RT-PCR results demonstrated the presence of endogenous hHB-

EGF. The BAT-like gene PGC-1 $\alpha$  was found to be statistically significantly upregulated in the cells that were infected with ADAM 12S ( $p = 0.05$ ), while the mock infected cells did not exhibit this pattern of gene expression. The BAT-like gene UCP-1 was upregulated but not statistically significant ( $p = 0.05$ ). PRDM16, a BAT-like gene, was found to be statistically significantly downregulated in ADAM 12S infected cells. The Seahorse metabolic assay demonstrated an increase rate of glycolysis for ADAM 12S cells after exposure to a stressor mix, composed of FCCP and Oligomycin, when compared to their basal rate. ECAR was significantly increased in ADAM 12S cells compared to MOCK cells after exposure to catecholamines and the stressor mix (FCCP and Oligomycin).

**Conclusions:** These results further support previous findings that co-expression of HB-EGF and ADAM 12S stimulates cellular reprogramming into brown adipose tissue (BAT)-like cells. We believe that ADAM 12S stimulates cellular reprogramming into BAT-like cells utilizing endogenous hHB-EGF. These novel insights may provide the first evidence demonstrating BAT-like cellular reprogramming occurs *in vivo* in humans. This research has possible therapeutic applications to combat obesity and type II diabetes.

### A370

#### **Revisional surgery in 2000 consecutive Patients Who Had Sleeve Gastrectomy for Morbid Obesity in a Single Center.**

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#### **Background:**

Laparoscopic sleeve gastrectomy (SG) is the most commonly performed bariatric procedure in France. Despite its safety and efficacy, long-term complications of SG are not rare including gastro-esophageal reflux disease (GERD), twisting, stenosis, insufficient weight loss, and weight regain. The goal of this study was to analyze the pattern and short-term results of surgical revision in patients with SG.

#### **Methods:**

Patients who had revisional surgery (RS) after SG were retrospectively identified and subsequently divided in 4 subgroups according to preoperative body mass index (BMI) ( $<$  or  $>$  50 kg/m<sup>2</sup>) and the presence or not of GERD.

#### **Results**

Between December 2004 and September 2017, 2000 patients had SG; of whom 228 patients were lost to follow-up (11.4 %).

Out of 1772 patients, 288 had RS (16.3 %) for inadequate weight loss, GERD, or stenosis, respectively. The performed procedures included Roux en Y Gastric Bypass (RYGB) (60 %), re-SG (13 %), Duodenal Switch (DS) (12 %), Single Anastomosis Duodeno-Ileal Shunt (SADI-s) (11 %), and miscellaneous (4 %).

Median interval to RS was 29 months (18-81). Overall median operating room time was 170 min (range, 100–290). Overall median length of hospital stay was 72 hours (range, 48-120). Mortality rate was nil. Overall complication rate was 8 %.

#### **Conclusions**

RS options after SG are safe and lead rarely to complications. Nowadays, SG could be

considered as the first step of a potentially multi-step bariatric pathway.

### A371

#### **Predictors of suicidal ideation in adolescents five years after bariatric surgery – results from a prospective Swedish nationwide study (AMOS)**

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Skane university hospital<sup>1</sup> Linköping University<sup>2</sup> Karolinska Institutet<sup>3</sup> Lund University<sup>4</sup> National Institute for Health & Welfare<sup>5</sup> University of Gothenburg<sup>6</sup> Örebro University<sup>7</sup>

Introduction: There is an increased risk of suicidal behavior after bariatric surgery, but underlying causes are poorly understood. Also, little is known about suicidal ideation in those who undergo bariatric surgery as teenagers.

Methods: Suicidal ideation was assessed in 62 patients (66 % girls), 5 years after undergoing laparoscopic Roux-en-Y gastric bypass as teenagers (13-18 years, mean age 16.9). Suicidal ideation during the past 14 days was assessed using one item from the Beck Depression Inventory-II. Other aspects of mental health (anxiety, depression, mood, self-esteem, and eating-related problems) were assessed at baseline and at the 2-year follow-up using questionnaires.

Results: At the 5-year follow-up, 10 (16%) of patients reported suicidal ideation. Only the mood dimension calmness/tension at baseline could significantly predict suicidal ideation at the 5-year follow-up; OR=0.25 ( $p=0.045$ ). From the 2-year assessment self-esteem (OR=0.86;  $p=0.011$ ), anxiety (OR=1.09;  $p=0.027$ ), depression (OR=1.06;  $p=0.030$ ), mood (OR=0.07;  $p=0.005$ ), and emotional eating (OR=1.05;  $p=0.003$ ) were all significant predictors of suicidal ideation 5 years after surgery.

Conclusions: Suicidal ideation occurs in patients 5 years after bariatric surgery, but our findings indicate that it is difficult to predict who will have suicidal thoughts post-surgery based on baseline mental health assessment. However, several forms of self-assessed mental health problems at year 2 can predict suicidal ideation at year 5, emphasizing the importance of continued mental health screening several years after adolescent bariatric surgery.

### A372

#### **Selective Upper Gastrointestinal (UGI) Contrast Imaging after Laparoscopic Roux-en-Y Gastric Bypass (LRYGB)**

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Summa Health System, Akron City Hospital<sup>1</sup> Summa Health System, Akron City Hospital<sup>2</sup>

### **BACKGROUND:**

Routine UGI contrast imaging is often obtained in the immediate post-operative period after LRYGB. A study was undertaken to determine the safety and potential monetary savings of obtaining UGI imaging on a selective basis.

### **METHODS:**

A prospective study was conducted over one calendar year by one bariatric surgeon. UGI contrast imaging was obtained selectively for tachycardia, fever, leukocytosis, dysphagia, atypical abdominal pain or high risk procedures. Patient demographics, BMI, comorbid conditions, length of operation, length of stay and outcomes were recorded. Aggregate hospital costs of obtaining UGI imaging included salaries, supplies, medications, capital depreciation and transportation costs.

### **RESULTS:**

102 LRYGB operations were performed. Mean age was 43.9 years, mean BMI was 46.9 kg/m<sup>2</sup> and mean length of stay was 2.2 days. UGI studies were selectively ordered on 2 patients, one for post-operative pain, nausea, and tachycardia and one for high degree of technical difficulty. No positive findings were noted on either study. Two patients underwent endoscopy with dilation for gastrojejunostomy stricture within 30 days. Six patients, one who had an UGI study, were readmitted within 30-days for pneumonia, shortness of breath, nausea and vomiting and abdominal pain.

The institutional savings of an avoided UGI contrast study is \$210 per study resulting in \$21,000 per year for one surgeon's practice.

### **CONCLUSION:**

Selective use of UGI contrast studies after LRYGB is a safe practice for experienced bariatric surgeons and may represent a significant savings opportunity for high volume bariatric centers.

### **A373**

#### **Preoperative weight-loss via very low caloric diet (VLCD) and its effect on short and long-term weight loss after bariatric surgery.**

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Singapore General Hospital<sup>1</sup>

#### **Background**

The effect of preoperative weight-loss via very low caloric diet (VLCD) on long-term weight loss post-bariatric surgery (BS) has been conflicting. We aimed to analyse its impact on weight loss for 5 years post-BS.

## Methods

Patients (n=307) who underwent sleeve gastrectomy (SG) or gastric bypass (GB) from 2008-2018 in a tertiary centre were studied. VLCD was prescribed for 14 days preoperatively. Patients were followed-up for 5 years. Post-operative weight loss was compared in patients with preoperative weight gain (WG), weight loss<5% (WL<5%), and weight loss≥5% (WL≥5%). Preoperative WL was defined as weight before and after VLCD, postoperative WL defined as weight difference between post-VLCD weight and follow-up weight. Total weight loss (TWL) encompassed pre and postoperative WL.

## Results

Weight changes after VLCD showed preoperative WG=66(21.4%), WL<5%=202(65.7%), and WL≥5%=39(12.7%). Baseline characteristics including gender (male 37.7%), age (mean 40.5years), pre-VLCD BMI (mean 42.6kg/m<sup>2</sup>), and surgery type (SG 74.2%) were similar across groups.

Patients with WG lost significantly more weight up to 24-months post-operatively compared to the WL groups, (%postoperative WL at 1-month: WG=11.4%, WL<5%=8.2%, WL≥5%=6.3%, p<0.001; 12-months: WG=29.1%, WL<5%=23.6%, WL≥5%=21.9%, p<0.001; 24-months: WG=26.6%, WL<5%=22.1%, WL≥5%=18.4%,p=0.013).

WL≥5% group had greater TWL at 1 and 3-months (1-month %TWL WG=9.3, WL<5%=10.2, WL≥5%=13.4, p<0.001; 3-month %TWL WG=17.1%, WL<5%=17.2, WL≥5%=20.8, p<0.001). However, there was no difference in TWL beyond 6-months.

## Conclusion

Preoperative weight loss via VLCD was associated with reduced postoperative weight loss after BS. TWL may be a more accurate metric to measure weight loss after BS. There was no significant difference in long-term TWL.

## A374

### Impact of RYGB on calcium metabolism in Chinese patient with obesity

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First Affiliated Hospital of Jinan Univ.<sup>1</sup>

**Introduction:** Changes in bone metabolism following Roux-en-Y gastric bypass (RYGB) in patients with obesity have yielded inconsistent results. Nevertheless, no data exist on changes in calcium (Ca) metabolism after RYGB in Chinese obese subjects.

**Objectives:** The aim of this study was to identify the impact of RYGB on vitamin D, parathyroid hormone (PTH), Ca and phosphorus (P) metabolism in Chinese patients with obesity, and predictors of postoperative change.

**Methods:** The patients undergoing RYGB between January 2015 and October 2018 in our hospital was retrospectively reviewed. Serum PTH, P, Ca, and 25-hydroxyvitamin D (25OHD)



levels were collected before and 6 months after RYGB.

**Result:** In total, 165 patients were included in the study. After RYGB, the mean body mass index (BMI) level significantly reduced, the Ca, P and 25OHD levels increased, while the PTH level remained similar. Preoperative PTH level, percentage of excess weight loss (%EWL), and BMI change were independent predictors of postoperative PTH change. Preoperative P and Ca levels could predict postoperative P and Ca change, respectively.

**Conclusion:** A significant increase in serum 25OHD, Ca, and P are expected after RYGB at the short term. And preoperative 25OHD, Ca, and P levels were predictors of postoperative change.

### A375

#### **Synchronous Ventral Hernia Repair with a Hybrid PTFE Biomaterial Mesh during Sleeve Gastrectomy-A Retrospective Study**

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Novant Health Rowan Medical Center<sup>1</sup>

The safety of placing permanent mesh during a clean-contaminated case has long been debated. Opponents argue increased perioperative morbidity. However, the advent of new bio-synthetic hybrid mesh has made it safe to perform ventral hernia repair during sleeve gastrectomy.

A retrospective study of ventral hernia repairs performed during laparoscopic sleeve gastrectomy using macroporous PTFE knit layered between PGA/TMC biomaterials (“hybrid mesh”) compared to laparoscopic sleeve gastrectomy. We identified 10 out of 169 patients undergoing sleeve gastrectomy as having an abdominal wall hernia over a two year period. All ten ventral hernias were repaired at the time of sleeve gastrectomy. Median hernia fascial defect size was 9cm<sup>2</sup>. All defects were repaired with the same “hybrid” mesh, utilizing a bridged IPOM technique. Comparison of operative time, length of stay, infection rate, recurrence rate, and postoperative readmission rate was performed.

Average operative time of sleeve gastrectomy with hernia repair was 135 minutes compared to 77 minutes. In the hernia group: hernia recurrence 0%, mesh infection rate 0%, 30-day readmission rate 0%, average length of stay 1.9 vs 1.2 days. Mean follow-up time was 9.1 months (1 to 24 months).

Although limited by sample size, synchronous abdominal wall hernia repair with the use of a “hybrid” mesh at the time of laparoscopic sleeve gastrectomy is a safe procedure with no observed increased rate of infection, readmission, or perioperative morbidity. We observed a slightly increased length of stay and operative time for the hernia group. Therefore, we recommend synchronous hernia repair during sleeve gastrectomy.

A376

**The efficacy and safety of Primary Obesity Surgery Endolumenal procedure for weight loss: A meta-analysis**

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**Background:** Primary Obesity Surgery Endolumenal (POSE) procedure is an incisionless gastric plication technique inducing gastric volume reduction for weight loss. Our meta-analysis aimed to evaluate the efficacy and safety of POSE.

**Methods:** MEDLINE and EMBASE databases were searched through March 2019 for eligible studies. Data on body weight before and after POSE and side effects were extracted. Pre- and post-operative mean of each outcome of interest and corresponding SD were extracted from each study and the mean difference (MD) was calculated. Pooled MD was then calculated by combining MDs of each study using random-effects model. The between-study heterogeneity was quantified using the  $Q$  statistic and  $I^2$ .

**Results:** Four studies involving 443 patients were included. The mean baseline BMI ranged from 36.0 to 38.0 kg/m<sup>2</sup>. The pooled %total body weight loss at 6 months was 12.0% (95%CI 7.03 – 17.00,  $p < 0.01$ ). There were no serious adverse events observed with a follow-up period of 6-12 months. Some patients experienced mild abdominal pain, nausea, vomiting, throat pain, or chest pain, which resolved with conservative medical treatment. Minor post-operative bleeding was observed in 2 patients that resolved within 24 hours.

**Conclusions:** This meta-analysis demonstrated that POSE is a safe technique that provides clinically significant weight loss.

A377

**Use of Mobile Technology to Assess Patterns of Common Gastrointestinal Symptoms after "Risky" Food Choices/Eating Behaviors: Differences between Roux-en-Y gastric bypass (RYGB) and Sleeve Gastrectomy (SG) Patients.**

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The Miriam Hospital/Brown Alpert Medical School<sup>1</sup> The Miriam Hospital/Brown Medical School<sup>2</sup> Beth Israel Deaconess Medical Center<sup>3</sup> University of Tennessee<sup>4</sup>

**Background--** Gastrointestinal symptoms (e.g., diarrhea) linked to suspected "risky" food choices (e.g., fatty meats) and eating behaviors (e.g., eating quickly) after bariatric surgery are common, but poorly understood. Our study is the first to use mobile technology to better understand these symptom-behavior relationships in near real-time, comparing patterns for RYGB and SG patients.

**Methods**--RYGB and SG patients used smartphones to record gastrointestinal symptoms (e.g., bloating) and "risky" food choices (e.g., carbonated beverages)/eating behaviors (e.g., eating past satiation) at 4 semi-random times daily for 10 days at 3- and 6-months postoperatively.

**Results**--RYGB (n=19) and SG (n=53) were similar in age (44.4±11.2 years), sex (90% female), and preoperative BMI (47.3±12.3 kg/m<sup>2</sup>). Across postoperative timepoints, SG vs. RYGB experienced higher % probability (i.e. % symptom probability without behavior->after behavior) of: bloating after simultaneous eating/drinking (6.3%->17.6% vs. 8.0%->5.9%, *p*=.037); nausea (2.5%->9.5% vs. 3.8%->3.2%, *p*=.037) and bloating (6.2%->29.9% vs. 7.6%->8.6%, *p*=.006) after eating past satiation; and diarrhea after carbonated beverages (1.9%->4.8% vs. 3.2%->3.3%, *p*=.006). RYGB vs. SG experienced greater increases in likelihood of dehydration after sweets (2.1%->8.4% vs. 14.4%->12.2%, *p*=.048). RYGB and SG both experienced higher probability of: reflux after eating past satiation (2.4%->8.7%, *p*=.001); nausea (*p*=.004) and diarrhea (*p*=.002) after more sweets; and cramping after drinking alcohol (2.6%->8.7%, *p*=.026) and more sweets (*p*=.002).

**Conclusions**--SG patients appear more susceptible to gastrointestinal problems after "risky" food choices/eating behaviors. However, some "risky" behaviors affect SG and RYGB patients equally. Findings suggest that patients may benefit from education/counseling to limit "risky" behaviors that are tailored to their surgery type.

### A378

#### **Feasibility and utility of a telemedicine protocol for post discharge follow-up in patients undergoing Bariatric surgery.**

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University of Iowa Hospitals and Clinics<sup>1</sup> Mercy Medical Center Cedar Rapids<sup>2</sup>

Background: Telemedicine is being increasingly utilized to provide perioperative care to surgical patients. We report the feasibility and utility of our telemedicine protocol during the post discharge period for bariatric surgery patients.

Methods: Between December 2017 and April 2019, 90 consecutive patients underwent laparoscopic/ robotic sleeve gastrectomy or roux-en-y gastric bypass by a single surgeon. The first 45 patients (group A) were followed without the telemedicine protocol, while the subsequent 45 patients (group B) were instructed to follow-up on post-discharge day 1 through a HIPPA compliant videoconferencing platform accessible within Epic (electronic health record (EHR) system) via smartphone. Additionally, this group provided daily oral intake records for 2-4 weeks after discharge through Epic. A nurse coordinator conducted the videoconferencing, and reviewed daily intake records. Demographic and clinical outcomes were prospectively collected and analyzed.

Results: Median patient age (46 years (28-69) vs. 40 (20-66)), females (78% vs. 87) and sleeve gastrectomy (87% vs. 71) were similar between groups. Two patients did not complete the videoconference due to not having a smartphone, while 2 patients were unsuccessful secondary to technical difficulties. Within 4 weeks of discharge, there were 2 vs.2 readmissions and 9 vs. 4 patients who required intravenous fluids as an outpatient for dehydration in groups A and B

respectively.

Conclusion: Our EHR-based telemedicine protocol is feasible and effective for follow-up in post-operative bariatric surgery patients. Further investigations to evaluate its impact on clinical outcomes and patient satisfaction are justified.

### **A379**

#### **Outcomes of primary 305 robotic Biliopancreatic Diversion with Duodenal Switch operations**

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Abington Jefferson Hospital<sup>1</sup>

BilioPancreatic Diversion with Duodenal Switch (BPD-DS) is considered the most effective procedure to achieve and maintain weight loss and co-morbidity resolution. A total of 305 patients underwent primary BPD-DS from December/2008 till February/2018 at Abington Jefferson Hospital.

Inclusion criteria: Morbidly obese patients, aged 18 years and above, who had primary Robotic one stage BPD-DS at our institution in the aforementioned period.

Exclusion criteria: All Patients who had previous weight loss surgery, two stages operation, open BPD-DS were excluded.

The patient population consisted primarily of women (69.3%). The mean age for all individuals was 44.4 years. The mean pre-operative BMI and weight were 49.9 kg/m<sup>2</sup> and 142.9 kg, respectively. Most of the patients leave at post-operative day one, but mean hospital stay was 2.2 days.

Postoperatively, 94% of patients at 1 month, 88.4 % of patients at 3 months, 85.8 % of patients at 6 months, and 73.9 % of patients at 1 year returned to the office for follow-up visits. In 1,3,6, and 12-month follow-ups, patients experienced 17.5%, 33.9%, 51.9%, and 70.3% excess weight loss, respectively. Twenty-one patients (6.9 %) presented to the emergency department within 90 days after their surgery. Most common reason was dehydration. Thirteen of them (4.2%) were readmitted. And five patients (1.6%) were taken back to the operating room. No BPD-DS-related mortality occurred in this study up to 12 months after the procedure.

### **A380**

#### **Using novel technology to understand bariatric surgery patients' physical activity experiences in near real-time through accelerometry-prompted ecological momentary assessment**

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Brown University/The Miriam Hospital<sup>1</sup> The Miriam Hospital/Brown University<sup>2</sup> Beth Israel Deaconess Medical Center<sup>3</sup>

**Background:** This study is the first to pilot-test a novel methodology combining Bluetooth-connected physical activity (PA) sensors and ecological momentary assessment (EMA) to assess PA context/experiences in near real-time following objectively-quantified PA. This is important because accelerometry cannot provide contextual information about PA that is necessary to develop effectively tailored PA interventions for bariatric surgery patients.

**Methods:** Participants wore an accelerometer and carried a smartphone with an EMA application for 10 days preoperatively. These devices communicated via Bluetooth and an online platform such that shortly after an accelerometer-detected  $\geq 10$ -minute PA bout, participants were automatically sent a survey on type of PA performed, physical/social context, and related affect.

**Results:** Seventy-six participants (BMI: 47.3 $\pm$ 12.3 kg/m<sup>2</sup>; age: 44.4 $\pm$ 11.2 years; 90% female) completed EMA, of whom 71 received 751 PA-triggered surveys. EMA provided novel data about PA experiences. For example: 1) participants described feelings during PA in exclusively favorable terms (e.g., happy, calm) 74% of the time, with endorsement rates unrelated to BMI ( $p > .05$ ); and 2) PA was performed more often with a family member (50%) than alone (23%). Pilot-testing also revealed certain challenges that necessitate additional refinements, most notably: 1) PA bouts were infrequent, suggesting lower thresholds (intensity/time) may be warranted for triggering surveys; and 2) 66% of PA-triggered surveys were valid per participants' confirmed PA engagement, demonstrating a need to refine real-time sensor-based PA classification.

**Conclusions:** This novel methodology appears feasible, provides new insights about surgery patients' objectively-quantified PA, and highlights additional modifications to advance this technology and inform intervention development.

### A381

#### **Clinical Characteristics and Outcomes Vary by Sex in Open Roux-en-Y Gastric Bypass**

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Inspira Medical Center Vineland<sup>1</sup>

Introduction[SG1] : Today, open Roux-en-Y gastric bypass (ORYGB) is reserved for patients too obese for laparoscopic RYGB or with intra-abdominal scarring. Every clinical insight helps with these fragile individuals. Variation pre-operative and in outcomes by sex in ORYGB is unknown.

Objective: Identify variation by sex in clinical characteristics and outcomes of ORYGB.

Methods: Data from 5389 ORYGB patients in the Surgical Review Corporation's BOLD database (demographics, weight, BMI, and 31 co-morbidities), pre-operative and through 24 months, was analyzed retrospectively in two groups: Women (n=4093) and Men (n=1296). Statistics: ANOVA for continuous variables; general linear model modified for binomial distribution of dichotomous variables.

Results: Female/male age (45.6 $\pm$ 12/47 $\pm$ 11), %race (African-American 10/7. Caucasian 68/75,

Hispanic 13/9), %Medicaid (10/6), %unemployment (27/31), (weight (132+-28/169+-43kg baseline; 87+-10/110+-23kg 12 months; 83+-106kg 24 months) and baseline BMI (49+-9/53+-11), varied (p<0.01). Pre-operative female asthma, cholelithiasis, fibromyalgia, back pain, pseudotumor cerebri, stress incontinence, GERD, mental health diagnosis, depression, and psychological impairment increased versus men; male hernia, angina, CHF, DVT/PE, ischemic heart disease, hypertension, pulmonary hypertension, sleep apnea, obesity hypoventilation, diabetes, dyslipidemia, gout, leg edema, impaired functional status, alcohol and tobacco use were higher. At 24 months, only hernia, cholelithiasis, GERD, stress incontinence, gout, depression, angina, asthma, alcohol/tobacco varied by sex.

Conclusion: Weight, BMI and 26/31 obesity co-morbidities vary by sex pre-ORYGB. Cardiopulmonary and endocrine/metabolic conditions dominate men, with increased alcohol/tobacco. Abdominal and psychological issues affect women. Female/male differences in the most serious weight-related conditions resolve by 24 months. This knowledge may facilitate patient selection of surgically complex ORYGB patients.

### **A382**

#### **Endoscopic management of chronic gastrojejunal anastomotic stricture after gastric bypass surgery**

Anthony Mark *Triangle VA*

FOH

**AUTHORS/INSTITUTION:** Anthony L Mark, MD; Courtney Culbreath, MD; Pamela Masella, DO, Devon T. Collins, MPH, CPH, Chang Liu, PhD, Rajev Nain, MD, Hamid Pourshojae, DO, Amir Moazzez, MD.

**INTRODUCTION:** Bariatric surgery procedures performed has risen with the increase in obesity since 2000. Laparoscopic bypass surgery is one of the most commonly performed operations for surgical weight loss. Chronic gastrojejunal anastomotic (G-J) strictures pose a difficult clinical management challenge.

**DESCRIPTION:** A 51-year-old female with a significant medical history of morbid obesity (BMI 49.9) was medically cleared to undergo laparoscopic Roux-en-Y gastric bypass (RYGB). Thirteen months following an uncomplicated laparoscopic bypass, she developed a G-J stricture. Serial dilations failed as a therapeutic option. Balloon dilation resulted in a perforation of her G-J anastomosis requiring urgent treatment. A fully-covered expandable metal stent was utilized and resolved the perforation within 48 hours of placement.

**DISCUSSION:** Serial balloon dilation is an accepted and effective treatment for G-J stricture after Roux-en-Y gastric bypass. In this case, repeated long-term dilation resulted in a perforation of G-J stricture. The patient's leak and stricture were successfully treated utilizing a fully-covered expandable endoscopic metal stent and propose endoluminal stenting may be an effective treatment for chronic G-J stricture after Roux-en-Y gastric bypass.

**CONCLUSION:** Roux-en-Y gastric bypass is one of the most common procedures performed for

obesity and obesity-related diseases. Strictures form in up to 31% of patients undergoing Roux-en-y gastric bypass. Strictures can be treated with endoscopic stenting.

### **A383**

#### **Case Report: Superior Mesenteric Artery Syndrome following Laparoscopic Adjustable Gastric Banding**

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Yeouido St. Mary's Hospital

Bariatric surgery is the most effective and durable treatment for morbidly obese patients. However, there are remained unsolved problems with various types of complications. Superior mesenteric artery syndrome is a rarely known condition occurred following bariatric surgery. We experienced 54-year-old female patient diagnosed with superior mesenteric artery syndrome 5 years later after laparoscopic adjustable gastric banding. Because the patient refused to get band removal and weight gain for conservative care, the laparoscopic duodenojejunal bypass was successfully performed for this patient.

### **A384**

#### **Oral Iron Supplementation for treatment of iron deficiency after metabolic surgery: Does it work?**

David Hanna *Danville PA*<sup>1</sup>, Michael Makar *Highland Mills NY*<sup>2</sup>, Craig Wood *Danville PA*<sup>1</sup>, Glenn Gerhard *Philadelphia PA*<sup>3</sup>, Peter Benotti *Southold NY*<sup>1</sup>, Christopher Still *Danville PA*<sup>1</sup>  
Geisinger Medical Center<sup>1</sup> Rutgers Robertwood Johnson<sup>2</sup> Temple University<sup>3</sup>

#### **Introduction**

Iron deficiency and its associated anemia are common nutritional complications of metabolic surgery. The efficacy of oral iron supplementation for prevention and/or treatment of iron deficiency is controversial.

#### **Methods**

Adult patients (N=21) with hypoferritinemia (ferritin <20 ng.ml) who were 18-36 months after RYGB were identified. Patients were randomized to 65 mg iron via Ferrous Sulfate or 13.5 mg ProfferinES. An iron panel and complete blood count was drawn before initiation of the supplements and at approximately 4 months afterwards. Patients were contacted to measure adherence with iron treatment.

#### **Results**

Follow-up in this trial was 76% (N=16). 4 subjects (25%) were non-compliant. Of the 5 patients that completing iron treatment with baseline anemia (hemoglobin < 12 gm/dL), all 5 (100%) responded by increasing their hemoglobin into a normal range. Of the 7 patients completing iron treatment without baseline anemia (hemoglobin >= 12 gm/dL), 86% remained non-anemic at end

of treatment. All 4 non-compliant patients were not anemic at the start of the study but 50% (n=2) progressed to anemia at 4-month follow-up (Figure 1). Observed differences in the response to Ferrous Sulfate vs. Proferrin ES were not significantly different.

### **Conclusions**

Patients with iron deficiency and anemia after RYGB can respond to oral iron supplementation. Patient noncompliance in the setting of iron deficiency invites deficiency progression and anemia.

### **A385**

#### **PRE-OPERATIVE DIRECT AND INVERSE CLINICAL CHARACTERISTIC VARIATIONS BY AGE RESOLVE FOLLOWING OPEN ROUX-EN-Y GASTRIC BYPASS (ORYGB) Ajay Menon, DO, Gus J Slotman, MD Department of Surgery Inspira Health Network, Vineland, NJ**

Ajay Menon *Vineland NJ*<sup>1</sup>, Gus Slotman *Vineland NJ*<sup>1</sup>  
Inspira Health Network<sup>1</sup>

**Introduction:** Open Roux-en-Y gastric bypass (ORYGB) is reserved for complex patients too obese for laparoscopic surgery or with massive intra-abdominal scarring. Presentation and outcomes by age in ORYGB is unknown.

**Objective:** To identify variation by age before/after ORYGB.

**Methods:** Data from Surgical Review Corporation BOLD database 5389 ORYGB patients was analyzed retrospectively by age: <30 (607), 30-40 (1226), 40-50 (1465), 50-60 (1314), 60-70 (520) and >70 (34).

Statistics: ANOVA/general linear model.

**Results:** Baseline weight, BMI, female/male, Medicaid/Private insurance, PCOS(through 24 months), pseudotumor cerebri(PTC) varied inversely to increasing age ( $p<0.01$ ). African-American/Caucasian/Hispanic/Asian/Other, panniculitis, mental health diagnosis(MHD), psychological impairment(PI), fibromyalgia, alcohol, liver disease, varied non-linearly among age groups. Pre-op hernia, angina, cholelithiasis, CHF, DVT/PE, impaired functional status(IFS), GERD, diabetes, gout, hypertension, dyslipidemia, lower extremity edema(LEE), musculoskeletal pain(MSP), obesity hypoventilation(OHS), sleep apnea(OA), PVD, stress incontinence(SUI), and unemployment (n=18) varied directly with age, <30 to 60-70/>70. At 12 and 24 months only CHF and PVD varied directly by age. 12 month GERD, MHD, depression, gout, MSP, back pain, PTC, PI, SUI (n=9) and 12-24 month hernia, CHF, diabetes, hypertension, OA, angina, IFS, dyslipidemia, LEE, smoking (n=10) varied non-linearly by age.

**Conclusions:** Direct age variations in 16/18 pre-operative clinical characteristics of ORYGB patients resolve by 12 months. Only CHF and PVD varied 12-24 months. Pre-operative ORYGB patients varied inversely by age in weight, BMI, sex, insurance, PCT, PCOS. Pre-operative race, 6 co-morbidities, and 19 co-morbidities 12-24 months post-ORYGB varied by



age non-linearly, peaking in 40-60 years. This advance knowledge of age variation can aid ORYGB management.

### A386

#### **How can we overcome the blind loop syndrome after laparoscopic sleeve gastrectomy with jejunal bypass**

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Keimyung university dongsan hospital

**Background:** Recent studies have shown metabolic effect of sleeve gastrectomy beyond just restriction of food intake. Although an improvement of insulin tolerance is reported after sleeve gastrectomy, it might be insufficient to treatment of type 2 diabetes. However, this operation also has a fear of blind loop syndrome. Recently, we added sleeve gastrectomy with resectional jejunal bypass as a surgical treatment option for morbid obesity patient with type 2 diabetes.

**Operative Techniques:** Overall procedures was similar with general sleeve gastrectomy. After completion of sleeve gastrectomy, small bowel was traced and measured a length from ligament of Treiz. Jejunum was divided at 40cm from ligament of Treiz. Entero-enterostomy for jejunal bypass was performed between biliopancreatic limb and small bowel below 150cm from the origin of alimentary limb, which is actually non-functional blind loop in this procedure. The final remaining blind loop, a 150 cm small bowel, can easily be removed via ligation

**Conclusions:** Laparoscopic sleeve gastrectomy with jejunal bypass is technically feasible procedure even for surgeon who is unexperienced for bariatric surgery but experienced for laparoscopic surgery. SG combined with intestinal loop induces better glycolipid metabolism than simple SG, with the lipid metabolism. It is not a difficult procedure to remove proximal jejunum that may cause blind loop syndrome. Long-term result should be verified for obesity control and nutritional problem.

### A387

#### **Does Sleeve Gastrectomy Expose the Distal Oesophagus to Severe Reflux? A Systematic Review and Meta-analysis**

Kai Tai Derek Yeung *London*<sup>1</sup>, Nicholas Penney *London*<sup>1</sup>, Leanne Ashrafian *London*<sup>1</sup>, Ara Darzi *London*<sup>1</sup>, Hutan Ashrafian *London*<sup>1</sup>

Imperial College London<sup>1</sup>

**Objective:** To appraise the prevalence of Gastro-esophageal reflux (GERD), Esophagitis and Barrett's Esophagus (BE) after sleeve gastrectomy (SG) through a systematic review and meta-analysis.

**Background:** The precise prevalence of new-onset or worsening Gastro-Esophageal Reflux (GERD) after SG is controversial. Subsequent Esophagitis and BE can be a serious unintended sequelae. Their post-operative prevalence remains unclear.

**Methods:** A systematic literature search was performed to identify studies evaluating post-operative outcomes in primary SG for morbid obesity. The primary outcome was prevalence of

GERD, Esophagitis and BE after SG. Meta-analysis was performed to calculate combined prevalence.

**Results:** A total of 46 studies totalling 10,718 patients were included. Meta-analysis found that the increase of postoperative GERD after Sleeve (POGAS) was 19% and De Novo reflux was 23%. The long-term prevalence of esophagitis was 28% and BE was 8%. 4% of all patients required conversion to RYGB for severe reflux.

**Conclusions:** The post-operative prevalence of GERD, esophagitis and Barrett's Esophagus following SG is significant. Symptoms do not always correlate with the presence of pathology. As the surgical uptake of SG continues to increase, there is a need to ensure that surgical decision-making and the consent process for this procedure considers these long-term complications whilst also ensuring their post-operative surveillance through endoscopic and physiological approaches. The long-term outcomes of this commonly performed bariatric procedure should be considered alongside its weight-loss and metabolic effects.

**[DECLARATION : THIS HAS RECENTLY (March 2019) BEEN PUBLISHED IN ANNALS OF SURGERY but we ask for consideration due to the topical nature of this abstract]**

**A388**

**One Anastomosis Gastric Bypass and Total Thyroidectomy - Not a good match?**

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Imperial College London<sup>1</sup> Imperial College Healthcare NHS Trust<sup>2</sup>

**Background:** We describe an interesting case of a 25 year-old female who presents as a specialist tertiary referral with severe refractory secondary hypocalcaemia after total thyroidectomy for a benign goitre. She had also undergone a one anastomosis gastric bypass. Symptoms include tetanic seizures, vertebral compression fracture, dental issues and iron deficiency anaemia.

**Objective:** There was excess weight loss from BMI 54.2 to 24 (kg/m<sup>2</sup>). She underwent full investigations including a barium swallow and follow through, CT abdomen and pelvis, an upper GI endoscopy and a NM parathyroid scan. She was reviewed by the bariatric dietitian and psychiatrist. We then proceeded to diagnostic laparoscopy where we found a 260cm Bilio-pancreatic limb with a total small bowel length of 430cm.

**Methods:** Despite maximal treatment with oral calcium supplements and parathyroid hormone injections, she remained intermittently symptomatic and required recurrent admissions for IV calcium replacement. Following multi-disciplinary team discussion and patient consent, a decision was made to perform a reversal of OAGB after a period of parenteral nutrition and electrolyte correction.

**Results:** The patient underwent a reversal of OAGB with no immediate complications.

**Conclusion:** There are several important transferrable learning points, (1) active absorption of calcium ions occur at the duodenum and proximal jejunum (2) patients need to be counselled and forewarned about possible complications of total thyroidectomy and duodenal exclusion

procedures (3) Close liaison of bariatric and endocrine surgical teams are required in such patients with total thyroidectomy only performed when absolutely necessary (4) Compliance with medication needs close attention.

### A389

#### **Kynurenic Acid- A Clue for Different Mechanisms of Action in Bariatric Surgery?**

Kai Tai Derek Yeung *London*<sup>1</sup>, Nicholas Penney *London*<sup>1</sup>, Luke Whiley *London*<sup>1</sup>, Hutan Ashrafiyan *London*<sup>1</sup>, Sanjay Purkayastha *London*<sup>1</sup>, Elaine Holmes *London*<sup>1</sup>, Ara Darzi *London*<sup>1</sup>  
Imperial College London<sup>1</sup>

**Background:** Roux-En-Y Gastric Bypass (RYGB) and Sleeve Gastrectomy (SG) are now both recognised as the most effective treatment options for morbid obesity and its related comorbidities. However, despite similar long-term outcomes, their precise mechanisms of action are yet to be fully understood.

**Methods:** 28 patients were included in this prospective study. 17 underwent RYGB and 11 underwent SG. 24-hour urine samples were collected pre-operatively and at 3-months post-operatively. These underwent untargeted metabolic profiling using ultrahigh-performance liquid chromatography tandem mass spectrometry with electrospray ionization method (UHPLC-ESI-MS/MS).

**Results:** Multivariate paired data analysis was performed. We found Kynurenic acid to be a statistically significant differentiator when comparing the post-operative urinary metabolome of those who have undergone RYGB and SG. Those who underwent RYGB had a 1.37-fold decrease at 3 months when compared to pre-operative baseline and those who underwent SG had a 1.04-fold increase.

**Conclusion:** Kynurenic acid is a metabolite found within the tryptophan essential amino acid metabolic pathway. It has documented correlation with obesity, satiety and Type 2 diabetes. This finding points towards possible mechanism of action differences when comparing RYGB and SG. Other metabolites within this pathway should be further investigated.

### A390

#### **Long term follow up to evaluate diabetes remission and risk of relapse in patients with type II diabetes (T2DM) following Laparoscopic sleeve gastrectomy (LSG)**

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Hamad Medical Corporation, Qatar<sup>1</sup> Hamad Medical Corporation<sup>2</sup>

## **Introduction**

Sleeve gastrectomy (LSG) proved effectiveness in improving T2DM .80% remission in the first year postoperatively [1]. Relapse occurs in 35 % of patients [2]. Several factors determine diabetes evolution [3]. Objectives are to evaluate T2DM remission rate in first year after LSG and long term risk of relapse.

## **Methods**

A retrospective study retrieved charts of T2DM (N = 240), age 26– 64, who underwent LSG at Hamad General Hospital, Qatar (2011 - 2016). We evaluated preoperative , one and five years post- operative data including: demographics, anthropometric (weight, BMI, EWL% and TWL %), biochemical (HbA1c % ,FBS, HOMA) and clinical (preoperative Insulin use, duration of T2DM). Bivariate correlation used to demonstrate correlations between pre, 1 year postoperative variables and T2DM remission. Logistic regression analysis used for T2DM relapse risk.

## **Results**

Mean age  $45.35 \pm 8.93$  years. (males 68.3 %). Mean follow up 4.5 years post LSG. At 1 year post LSG ,127 patients had T2DM remission ( 52.9%). Age, diabetes duration and HOMA were significantly positive correlated with HbA1c%, while, EWL% and TWL% had significantly negative correlation. Relapse occur in 37.8%, 54.2% were on insulin preoperatively with mean BMI ( $34.6 \pm 8.19$ ) kg/m<sup>2</sup>

Prevalence and Risk of T2DM relapse was significantly higher when preoperative duration of diabetes > 5 year and preoperative HbA1C% > 7

## **Conclusion**

Younger age, shorter T2DM duration, better diabetes control, lower HOMA and higher weight loss enhance T2DM remission post LSG. Duration of diabetes is the most significant risk factor and may predict diabetes relapse

## **A391**

### **Sleeve gastroplasty : Is it a good solution for obesity patients not eligible to surgery ?**

Vianna Costil *PARIS*

CLINIQUE DU TROCADERO

#### **Introduction**

Sleeve gastroplasty is an endoscopic procedure to help weight loss for patients with so-called "moderate" obesity, who are not eligible for bariatric surgery.

It reduces the size of the stomach by performing endoscopic trans-mural sutures with the Overstitch technique.

#### **Method:**

23 patients with a BMI between 30 and 40 received an endoscopic sleeve gastroplasty. Nutritional, behavioral, physical activity assessment and comorbidities were performed prior to the procedure. The duration of the procedure was evaluated. The post-procedure follow-up was carried out by a multidisciplinary team in face-to-face with the team of the medical establishment or by videoconference by MethodCO®.

#### Results:

The average weight loss is 20 kg at 6 months and TEWL is greater than 15% in 91% of cases. There was no complication. The duration of the procedure decreases with the learning curve, The maintenance and continuation of weight loss are correlated with the follow-up by the multidisciplinary team, the only guarantee of the modification of the eating behavior and the resumption of a regular physical activity.

#### Conclusion

The technique of endoscopic reduction of the stomach by the Overstich system has shown its effectiveness and its tolerance to lose weight and improve comorbidities in patients with "moderate" obesity. Its effectiveness is correlated with multidisciplinary follow-up to modify eating behavior and resume regular physical activity.

#### A392

##### **UCSF Pathways to Weight Loss Surgery Clinic**

Ryan Wilson *Nicasio CA*<sup>1</sup>, Elliazar Enriquez *San Francisco CA*<sup>1</sup>  
UCSF Health<sup>1</sup>

#### **Objective:**

UCSF Pathways to Weight Loss Surgery Clinic (P.W.C.) established as a non-surgical weight loss clinic to prepare patients for Bariatric Surgery, thus ensuring they meet their individual insurance plan's requirement consistently. The program's target was to increase revenue through additional billable clinic visits as well as decreasing patient fallout due to delays caused by the insurance payer mandated weight documentation requirements.

#### **Methods:**

Establish an internal weight loss clinic to see all new bariatric surgery patient monthly and provide a safety net for patients who choose to opt out of the P.W.C. program. Using Epic Hyperspace electronic health record reports to monitor clinic flow all bariatric patients 1 year prior to establishing pathways clinic as well as 1-year post were assessed to evaluate the benefits of the P.W.C. program.

#### **Results:**

Based on data from 2/1/18 (program start) – 2/1/19. Total of 172 completed P.W.C. visits. Average time patients spent in the pre-op process reduced from 8.2 to 4.9 months.

#### **Conclusions:**

The Pathways to Weight Loss Surgery Clinic decreased the time from new patient appointment to pre-op apt from 8.2 to 4.9 months, decreased patient fallout by reducing the amount of time spent in the pre-op process, and increase revenue generation through billable clinic visits as well as increased surgical case completion rates. At risk patients including Medicare and socioeconomically underserved populations such as city and county patients of San Francisco showed the greatest benefit from our Pathways Clinic with a 76.4% and 70% delay decrease

respectively.

### A393

#### **Alcoholic Liver Disease and Transplantation Following Bariatric Surgery**

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Mayo Clinic<sup>1</sup>

**Background:** Bariatric surgery is associated with an increased risk of alcohol use disorder and little empirical data exists regarding who develops alcoholic liver disease (ALD) and ultimately requires liver transplantation. Understanding which patients are at highest risk may inform clinical practice and help reduce alcohol-related complications post-bariatric surgery.

**Methods:** Data was abstracted from a large healthcare system with bariatric surgery and liver transplantation programs. There were 405 adults ( $M_{age} = 55.6 \pm 7.7$ , 19% female) who underwent liver transplantation for ALD between 1/1/1999 and 3/1/2019. Results compared using Wilcoxon rank sum and Fisher's exact tests. Additional medical and psychological data will be obtained via chart review prior to presentation.

**Results:** Of this sample, 5 (1.23%) required ALD liver transplantation following Roux-en-Y gastric bypass (RYGB;  $M_{age} = 42.7 \pm 9.3$ , 80% female). The average time between RYGB and transplantation was 10.3 years ( $SD = 4.8$ ). When compared to the larger transplantation population ( $n = 400$ ), those with a history of RYGB were significantly younger ( $p = .003$ ), included more women ( $p = .005$ ) and had significantly higher model for end-stage liver disease (MELD) scores at time of transplant ( $M = 28.0 \pm 5.5$  vs.  $20.2 \pm 8.4$ ,  $p = .045$ ).

**Conclusion:** Individuals with a history of bariatric surgery who subsequently require ALD liver transplantation are significantly younger, disproportionately female, and are more medically ill when compared to other transplant recipients with ALD. Additional research is needed to better understand the risk for severe alcohol use disorder and ALD following bariatric surgery.

### A394

#### **The Emerging Nutritional Problems of School Adolescents:Overweight/Obesity and Associated Factors in Jimma Town, Ethiopia Main author nurezeman gali Co authors Dessalegn Tamiru(dessalegn97@gmail.com) Mesesret Tamrat (mamitu8@yahoo.com)**

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**ABSTRACT** Background: Obesity in early life has a greater tendency to follow through adulthood and it will end up with serious medical problems, lower educational attainment and higher rates of poverty. However, there is a paucity of available information regarding the adolescent overweight and obesity in Ethiopia, particularly in the study area. Therefore, this study aimed to determine the magnitude and associated factors of overweight and obesity among school adolescents in Jimma town. Methods: School based cross-sectional study was conducted from March to April/2015 among 546 school adolescents. Study participants were selected using multistage stratified random sampling. An interviewer administered questionnaire was used to collect data. Data were analysed using SPSS v20 and WHO Anthro Plus. Multivariable logistic regression analysis was used to identify independent predictors of overweight and obesity at 95% confidence intervals. Results: The prevalence of overweight/obesity was 13.3% (overweight (11.8%) and obesity (1.6%)). The findings of this study showed overweight/Obesity were significantly associated with being a female (AOR=3.57 [95%; CI: 1.28-9.9], attending private schools (AOR=7.53[2.51-22.3]), lack of paternal education (AOR=5.57[1.53-20.26]), high household economic status (AOR=3[1.094-8.26]) and not being vegetarian (AOR=9.23[1.68-50.8]). Adolescents who are physically inactive (AOR=3.7[1.06-13.02]) and those who are sedentary (AOR= 3.64[1.39-9.5] were more likely to develop obesity compared to their counter peers. Conclusions: The proportion of overweight/obesity among Jimma town school adolescent was considerably high. Being a female, learning in private school, lower paternal education, high household economic status, limited fruit and vegetable consumption and sedentary life were significantly associated with overweight/obesity. Therefore, there is a need of promotion of public awareness on healthy lifestyles and eating habits through both government and adolescents family.

### **A395**

#### **Spanish Translation of the Weight Related Abuse Questionnaire (WRAQ): Addressing the Disparity in Psychological Assessment Materials for Bariatric Patients Who Are Non-English Speakers (NES)**

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**Introduction.** Weight related abuse (WRA) has significant negative impact on, and is highly prevalent for, individuals with obesity, with rates of 60-67% for individuals seeking bariatric surgery. The Latinx population is one of the largest groups of NES and has the second highest rate of obesity (40%) in the U.S.A. There is a need to adapt and translate measures of WRA to assess WRA in Latinx individuals who are NES. This report describes the adaptation and translation into Spanish of the WRAQ.

**Methods.** The WRAQ physical and verbal abuse subscales were translated into Spanish, and back-translated into English by non-region-specific bilingual-Spanish/English speakers to assess language consistency. An expert panel, consisting of translators and respective experts in psychology and Spanish linguistics reviewed, revised, and synthesized the measure versions. The final outcome was a synthesized Spanish WRAQ deemed usable for any native speaker of Spanish. Interviews with 6 bilingual-Spanish/English study participants were conducted to

establish semantic equivalence and cultural relevance.

Results. Participants largely agreed with the semantics finalized by the expert panel, however, commentary suggested including region-specific synonyms for specific emotions (i.e., anger, embarrassment) and experiences (i.e., poking, pinching) for increased relevance. The resulting document has undergone iterative forward-backward translation, expert review, and evaluation by interviews with bilingual/bicultural individuals. Additional data collection is ongoing to assess the translated measure's psychometric properties.

Conclusions. The WRAQ, including the physical and verbal abuse subscales, was translated into Spanish using a thorough translation methodology. Preliminary results support the cultural and semantic validity of this measure.

### **A396**

#### **Use of a Fibrin Sealant as a Primary Treatment for Esophageal Ulcers**

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Gastric bypass is an effective treatment for prolonged weight-loss and carries a 4% incidence of postoperative esophagitis/esophageal ulcer. This seven-patient retrospective case series describes the use of fibrin sealant as a primary treatment for esophageal ulcers.

Seven female patients, 50±9 years-of-age (Mean±SD), with a mean body mass index of 32.3±6.4, who underwent gastric bypass 7.0±4.9 years prior, reported symptoms consistent with an esophageal ulcer (Table 1). On esophagogastroduodenoscopy (EGD), 3 patients had a single esophageal ulcer <5mm, 2 with a single ulcer >10mm and 1 with multiple-sized ulcers.

Four ml of fibrin sealant, Tisseel (Baxter), was applied to the ulcer using a 180-cm catheter applicator, Duplocath 180 (Baxter) (Figure 1A, 1B). Fibrin sealant was applied uniformly over the ulcer and allowed to polymerize for 2 minutes (Figure 1C, 1D). Pain resolved in 71% of patients (5 of 7) at 24 hours after treatment. Pain resolved completely in 86% of patients (6 of 7), on average, 5.5±1.3 months after treatment. The patient without resolved pain, underwent esophageal resection despite no ulcer being visible on EGD.

Tisseel is indicated as an adjunctive hemostatic agent and as a surgical sealant. Tisseel contains aprotinin, an antifibrinolytic. Fibrin sealant clots containing aprotinin may slow clot degradation to provide a protective effect in the acidic environment aboral of the esophageal sphincter. Fibrin sealant has been shown to have wound healing properties that may promote the healing of esophageal tissue.

Given 71% immediate and 86% long-term resolution, Tisseel may be an effective treatment option for esophageal ulcers.

### **A397**



## **Reducing Barriers & Maximizing Patient Outcomes with Multidisciplinary Integration of Medical & Surgical Weight Management**

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Fortis BMI

Obesity medicine is rapidly evolving much like the diagnosis and management of diabetes over the last several decades. Patients and referral partners can get lost in this sea of change and find treatment options cumbersome, which can limit patients' access to care. Incorporating medical and surgical weight management under one roof can mitigate barriers like this and improve patient outcomes. Expanded scope of service helps to simplify the referral process for the medical community, streamline care and foster trusting patient-provider relationships. Additionally, AOM (anti-obesity medications) have come a long way and can be a wonderful tool in both medical and surgical weight management now more than ever. Obesity is a chronic disease with remission and relapses that requires dynamic treatment over time. Established relationships allow patients to maintain a connection, and in doing so facilitate treatment across the lifespan and the course of the disease. Multiple factors influence the treatment path patients choose including such things as insurance coverage, past experiences, finances, comorbidities and weight bias to name just a few. Many of these things change over time and impact a patient's perspective on care. Giving patients a central point of care for obesity just makes sense both for patient outcomes as well as revenue!

### **A398**

#### **Police Chiefs' Perspectives Regarding Obesity Among Law Enforcement Officers**

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**BACKGROUND:** Obesity not only affects the ability of police officers to perform their work-related duties, but, consequently, it may also impact public safety. Therefore, research regarding obesity among law enforcement officers is warranted, with some focus on the role of leadership to address this treatment population.

**METHODS:** Utilizing a qualitative methodological approach (Qualitative Description), the attitudes and perceptions of 36 police chiefs were assessed regarding obesity among law enforcement officers (LEOs). Participants were recruited using two state police chief association list-servs in the southern region of the U.S. A survey consisting of 24 open-ended questions as well as demographic questions were disbursed to the list-serve. Surveys were coded by members of the research team with a focus on key words, sentences, and phrases that were used by participants to answer questions.

**RESULTS:** 36 police chiefs, which included 31 males and five females, participated in the study. In terms of self-identification, 20 participants reported being overweight, 14 reported being a normal weight, and two participants abstained from the question, which differed from BMI results of self-reported height and weight. In the study, three themes emerged which included: (1) The Meaning of Obesity, (2) Resources to Address Obesity, and (3) The Culture of Health.

**CONCLUSIONS:** A consideration of the role that Police Chiefs have in leading a health initiative may be an important point of intervention in terms of increasing resources for LEOs.

### **A399**

#### **The Effect of Psychiatric Comorbidities in Patients Undergoing Bariatric Surgery**

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USC<sup>1</sup> Surgery<sup>2</sup>

#### **Background/Introduction**

Rates of psychopathology in patients undergoing bariatric surgery are reportedly higher than the general population and the relationship with postoperative outcomes is not well understood.

#### **Objectives**

Determine the association of preoperative diagnosis of depression or anxiety with 1) Postoperative weight loss success (PWLS) (defined as >50% excess weight loss) and 2) Self-reported postoperative satisfaction in patients who underwent Laparoscopic Sleeve Gastrectomy (LSG) or Roux-en-Y Gastric Bypass (RYGB).

#### **Methods**

Two models utilizing a binomial logistical regression were created to determine the association of preoperative diagnosis of depression or anxiety with patient characteristics, PWLS and postoperative agreement on a Likert scale to statements in table 1. Both models were statistically significant, depression model  $p < 0.001$ , anxiety model  $p = 0.002$ .

#### **Results**

Patients with a preoperative history of depression (D) or anxiety (A) were not found to have a statistically significant difference in rates of postoperative weight loss success (D:  $p = 0.737$ , Odds Ratio 1.091) (A:  $p = 0.819$ , OR 1.067) when compared to patients without a preoperative diagnosis. Similarly, patients with anxiety or depression did not report differences in quality of life (D:  $p = 0.738$ , OR 1.181) (A:  $p = 0.477$ , OR 1.475), satisfaction with surgical results (D:  $p = 0.804$ , OR 1.113) (A:  $p = 0.083$ , OR 0.611), or willingness to undergo surgery again (D:  $p = 0.545$ , OR 1.303) (A:  $p = 0.468$ , OR 1.406).

#### **Conclusion**

There was no association between a preoperative diagnosis of depression or anxiety with postoperative weight loss success, personal satisfaction with surgery, or the willingness to undergo surgery again.

## **A400**

### **Bariatric Surgery Weight Loss Success and Mental Health Symptomatic Improvement**

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USC<sup>1</sup> Surgery<sup>2</sup>

#### **Background/Introduction**

Patients undergoing bariatric surgery have high rates of psychopathology than the general population. The relationship between mental health and bariatric surgery is not well understood.

#### **Objectives**

Determine the association of self-reported postoperative improvement in anxiety and depression symptoms with 1) Postoperative weight loss success (PWLS) (defined as >50% excess weight loss) and 2) Self-reported satisfaction, in patients who were diagnosed with anxiety or depression prior to undergoing Sleeve Gastrectomy (SG) or Roux-en-Y Gastric Bypass (RYGB).

#### **Methods**

Two models utilizing a binomial logistical regression were created to determine the association between self-reported postoperative improvement in depression and anxiety symptoms with patient characteristics, PWLS and postoperative agreement on a Likert scale to statements in table 1. The anxiety symptom improvement model did not yield significant results. The depression symptomatic improvement model (Table 1) was statistically significant,  $\chi^2(11) = 41.902$ ,  $p < 0.001$ , (37.9%, Nagelkerke R<sup>2</sup>).

#### **Results**

Patients with a preoperative diagnosis of anxiety did not yield significant results in our statistical model. Patients who reported improvement in their depression symptoms were statistically less likely to attain surgical weight loss success ( $p = 0.026$ , OR 0.272). Patients with depression were also more likely to report satisfaction with their job ( $p = 0.035$ , OR 2.760), satisfaction with self ( $p = 0.003$ , OR 4.683), and satisfaction with the results of their surgery ( $p = 0.009$ , OR 12.005).

#### **Conclusion**

Patients who reported improvement in their depression were more likely to be satisfied with surgery, their outcomes, and correspondingly reported a higher willingness to undergo surgery again but were less likely to attain successful weight loss.

## **A401**

### **Impact of Surgical Assistants on Video Assessment of Technical Skill for Sleeve Gastrectomy**

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Michigan Medicine<sup>1</sup> University of Michigan<sup>2</sup>

**Introduction:** Surgical assistants can be vital to the technical quality of a laparoscopic procedure. We aimed to evaluate if the type of assistant impacts a surgeons' skill during sleeve gastrectomy (SG). **Methods:** We analyzed data from a state-wide bariatric-specific registry that includes de-identified surgical videos of a typical SG voluntarily submitted by practicing bariatric surgeons (n=29). Videos were peer-rated in a blinded fashion using a validated instrument with a 5-point scale (1 – lowest skill, 5 – highest skill). Overall scores, operative times and risk-adjusted 30-day complication rates were compared between surgeons who had a resident or fellow (R/F, n=9) vs surgeons who had a nurse practitioner, physician assistant or surgical scrub (N/P/S, n=20) as their assistant. **Results:** Surgeons who had a N/P/S as their assistant had a higher mean overall skill score (3.6 vs 3.2, p=0.006) and faster operative times (70.4 min vs 87.9 min, p<0.0001) when compared to surgeons with an R/F assistant. N/P/S surgeons had better scores for 'time and motion' (3.49 vs 3.04, p<0.017), 'flow of operation' (3.79 vs 3.44, p=0.015) and 'exposure' (3.70 vs 3.28, p=0.050). There was no significant difference in overall risk-adjusted complication rates (4.58% vs 4.44%, p=0.882) or surgical complication rates (2.05 % vs 1.60%, p=0.322) between the groups. **Conclusions:** Surgical assistants may affect how skillful a surgeon appears when performing SG but does not seem to affect complication rates. Evaluating how assistants are being used during laparoscopy may help identify specific maneuvers that can enhance the technical quality of the case.

#### A402

##### **Transversus Abdominis Plane Block with Liposomal Bupivacaine does not Significantly Reduce Post-Operative Narcotic use Among Bariatric Surgery Patients.**

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Montefiore Medical Center<sup>1</sup>

**BACKGROUND:** It has recently been suggested that liposomal bupivacaine as an extended release local anesthetic may provide lasting pain control and therefore decrease the need for narcotics in the immediate post-operative period.

**OBJECTIVES:** The aim of this study was to evaluate whether Transversus Abdominis Plane(TAP) block with liposomal bupivacaine(LB) decreased the use of post-operative narcotics compared to regular bupivacaine(RB) and no TAP block(NB) in patients undergoing laparoscopic weight loss surgeries.

**METHODS:** Patients undergoing either laparoscopic Roux-en-Y gastric bypass, sleeve gastrectomy, or sleeve to bypass conversion at Montefiore Medical Center over a 1 year period were randomized to receive TAP block using liposomal bupivacaine, TAP block with regular bupivacaine, or no block in a double-blind, randomized, controlled trial. The outcomes measured were post-operative use of opiates, pain score, length of stay, time to ambulation, nausea. Data was analyzed using Chi-Squared test and Analysis of Variance(ANOVA) F-test.

**RESULTS:** 219 patients were included in the study. Fentanyl patient-controlled analgesia usage was not significantly different between the groups (LB 351.4 v RB 360.7 v NB 353.9, p=0.97) at

48 hours post-operation. The pain scores (scale 1-10) were also similar among the groups with the mean for the LB group at 4.3, and RB and NB groups both at 4.7( $p=0.35$ ). The type of block or lack of block did not impact the length of stay, time to ambulation, or presence of nausea.

**CONCLUSION:** The LB TAP block did not significantly reduce the total opiate pain medication usage nor did it reduce pain scores among bariatric surgery patients.

### **A403**

#### **History of Abuse and Bariatric Surgery Outcomes**

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USC<sup>1</sup> Surgery<sup>2</sup>

#### **Background/Introduction**

Current studies demonstrate a link between morbid obesity and a history of physical or sexual abuse. There is limited data on the relationship between history of abuse and postoperative outcomes in patients undergoing bariatric surgery.

#### **Objectives**

Determine the association of history of sexual or physical abuse with 1) Postoperative weight loss success (PWLS) (defined as >50% excess weight loss) and 2) Self-reported postoperative satisfaction, in patients who underwent Laparoscopic Sleeve Gastrectomy (LSG) or Roux-en-Y Gastric Bypass (RYGB).

#### **Methods**

Two models utilizing a binomial logistical regression were created to determine the association of history of sexual abuse or physical abuse with patient characteristics, PWLS and postoperative agreement on a Likert scale to statements in table 1. Both models were statistically significant, sexual abuse model  $p=0.036$ , physical abuse model  $p=0.001$ .

#### **Results**

Patients who reported a history of sexual or physical abuse did not have statistically significant differences in rates of postoperative weight loss success ( $p=0.985$ , OR 1.011) ( $p=0.181$ , OR 2.507) or satisfaction with weight loss outcomes ( $p=0.185$ , OR 0.343) ( $p=0.991$ , OR 0.989) as compared to patients without these diagnoses. Patients with a history of physical abuse, however, reported lower postoperative quality of life scores ( $p=0.029$ , OR 0.096).

#### **Conclusion**

A history of sexual or physical abuse was not associated with differences in postoperative weight loss success or satisfaction with surgical outcomes. Patients with a history of physical abuse reported lower quality of life scores postoperatively.

#### **A404**

### **Single Institution Experience with Preoperative Psychological Assessment of the Bariatric Surgery Patient**

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USC<sup>1</sup> Surgery<sup>2</sup>

#### **Background/Introduction**

Based on the 1991 NIH consensus statement, patients undergoing bariatric surgery undergo a psychological evaluation prior to surgery at most bariatric centers across the country. There are no clear guidelines on what the assessment must involve and few studies have investigated the tangible results of psychological assessments previously performed.

#### **Objective**

To understand and characterize the use and utility of preoperative psychological assessments in patients undergoing bariatric surgery at our institution.

#### **Methods**

A retrospective, single-institution, multi-surgeon study was conducted on patients who underwent primary roux-en-y gastric bypass and sleeve gastrectomy between August 2002 and November 2017. Postoperative follow-up was obtained using a standardized telephone survey to determine the utilization of postoperative psychological therapy (PT). Preoperative psychological evaluation report (PPER) was obtained by chart review and only patients with a completed PPER were included in the study.

#### **Results**

272 patients were included in the study with an average follow up of 6.72 years. PPER was performed most commonly by an MD (30.83%), PhD (19.92%), or PsyD (14.66%). There was no absolute contraindication to proceeding with surgery in any of the 272 PPER reviewed. PT was recommended in 14.43% of PPER but only 15.38% of those patients underwent PT. The vast majority of patients who underwent PT did so independent of a recommendation based on their PPER (12.02%).

#### **Conclusion**

The results of our study revealed a highly heterogeneous PPER performed by a variety of practitioners. Surgical planning did not change as a result of any of the PPER we reviewed.

#### **A405**

### **VARIATIONS IN BARIATRIC SURGICAL PRACTICE PATTERNS BETWEEN GENERAL AND MINIMALLY INVASIVE SURGEONS**

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Temple University Hospital<sup>1</sup> Mayo Clinic<sup>2</sup>

**Introduction:** Bariatric surgical procedures are performed by both General Surgeons (GS) and Minimally Invasive Fellowship-trained (MIS) Surgeons. While there is an increasing focus to consolidate bariatric surgical care to clinical centers of excellence, it is unclear where and to what extent practice patterns and outcomes differ between General and MIS practitioners.

**Methods:** From the 2017 MBSAQIP database, we identified patients who had metabolic and bariatric surgery by either a General or MIS surgeon. Patient characteristics, perioperative practice patterns and outcomes were compared between study cohorts.

**Results:** Of 172,430 patients analyzed, 4,394 (2.54%) of procedures were performed by GS. Patients of GS had less comorbidity. GS had higher rates of certain procedural decisions such as staple-line over-sewing (28.61% vs. 21.14%, RR=1.35, p=0.001), postoperative swallow studies (42.33% vs. 31.78%, RR=1.33, p=0.001), and surgical drain placement (18.18% vs. 16.59%, RR=1.1, p=0.005). Overall, complications were low in both groups. While GS had higher rates of readmission (4.46% vs. 3.67%, RR=1.21, p=0.006), there was no difference in overall 30-day morbidity rates between specialties (5.53% vs. 4.93%, RR=1.12, p=0.068). GS had lower rates of infectious complications (0.86% vs. 1.42%, RR=0.61, p=0.002) but higher rates of noninfectious complications (2.37% vs. 1.9%, RR=1.24, p=0.027) (Table 1).

**Conclusions:** Bariatric surgery can be performed safely by both MIS and General surgeons. There are significant differences in patient selection and perioperative conduct between GS and MIS surgeons. Further research and larger cohorts are needed to determine how these differences may impact outcomes.

#### A406

##### **Male Bariatric Patients, Six Years Later: Where Are They Now?**

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#### **Abstract**

**Background and Objective:** Researchers have suggested that while bariatric surgery is the most effective treatment for morbid obesity, patients still experience difficulties maintaining initial weight loss, the further removed they become from their original surgery date. The purpose of this study was to explore men's experiences six years or more after weight-loss surgery.

**Material and Methods:** Utilizing qualitative research, the authors conducted a six-year follow-up investigation to a previous study regarding life after bariatric surgery among male patients. In this study, authors completed 13 semi-structured interviews with male bariatric patients and explored their lived experiences as individuals and as partners within couple relationships.

**Results:** Authors found three emerging themes which included: 1) Weight loss as a struggle; 2)

Fading support and feeling alone; and 3) Perceptions of Marriage and Family Therapists.

**Conclusion:** Authors discuss clinical implications and recommendations for Marriage and Family Therapists and other allied health professionals who may work with males transitioning beyond the initial phase of the weight-loss surgical process to include continued social support and utilizing a relational perspective for male patients.

#### A407

##### **Benefits of Suture Reinforcement in Laparoscopic Sleeve Gastrectomy**

Burcin Batman *istanbul*<sup>1</sup>, Hasan Altun<sup>1</sup>  
istinye university medical school<sup>1</sup>

##### **Abstract**

Obesity is an increasing problem worldwide. Laparoscopic sleeve gastrectomy is gaining popularity. Although it has unique complications such as leakage, bleeding and stenosis, it is a reliable procedure. A total of 1200 consecutive patients who underwent sleeve gastrectomy and omentopexy between March 2013 and December 2018 were enrolled in this retrospective study. Body mass index, age, sex, and postoperative complications were recorded in all patients. Of 1200 patients, 864 (72%) were female and 336 (28%) were male. The median age was 38 years (13 to 69 year). Preoperative median body mass index was found as 40.87 kg/m<sup>2</sup>(18 to 88 kg/m<sup>2</sup>). Operative complications included strictures which occurred in 16 (1.33%) patients, bleeding in 7 (0.58%), stapler line leaks in 3 (0.25%), wound infection in one (0.08%), fat necrosis in one (0.08%), splenic arterial injury in one (0.08%) and intraabdominal abscess in one (0.08%) patient. There was no mortality. Sleeve gastrectomy and omentopexy is a safe procedure with low complication rates.

#### A408

##### **Motivation for Bariatric Surgery among African American patients in an integrated healthcare system.**

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**BACKGROUND:** Very little is known about motivations for bariatric surgery among African American Males [AAM], a group that rarely undergoes this treatment for obesity.

**METHODS:** In 2016-17 patients affiliated with a large integrated healthcare system completed several baseline surveys via internet or phone. Surveys included a modified version of the Goals and Relative Weight Questionnaire (GRWQ), which examined 13 motivators/goals for surgery. Patients were instructed to rate each factor, using a Likert scale. We calculated descriptive statistics as well as Chi Square.

**RESULTS:** Survey respondents included 319 males, of which were 135 White Males [WM] (42%), 131 Hispanic Males [HM] (41%), 45 African American Males [AAM] (14%), and 10 “Other” Males [OM] (3%). For AAM, the most important factors that impacted the decision to have surgery included: 1) “Improvement or resolution of health conditions” (97.3%), 2) “To Feel Better about myself” (88.3%), and 3) “Being able to do the things I want to do” (83.7%). When analyzing the data using Chi square: the following items were significant 13i, (to be able to play with children/grandchildren), 13k, (to do the things that the person wants to do), 13L (to feel better about myself), 13m (to improve relationship with partner/spouse), and 13O, (for others (they want the person to do so).

**CONCLUSIONS:** Improvement of health, was the most important factor. Other factors specific to AAM should be considered when coordinating care for this treatment population.

#### A409

##### **Alterations of Uric Acid Features in Postoperative Short-term following Bariatric Surgery in Chinese Patients with Obesity: A Self-Controlled Observational Study**

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**Background.** Obesity is one of the most common risk factors for gout, while bariatric surgery is associated with a lower gout incidence. But few studies have been fully elucidated bariatric surgery effects on serum uric acid (UA) levels in postoperative short-term.

**Purpose.** To investigate the UA levels within 3-month postoperatively, the differences between normal UA group and hyperuricemia group, alongside determining predictive factors of peak levels of UA following surgery.

**Materials and Method.** 34 patients were recruited in this study. The pre- and postoperative variables were collected at baseline, follow-up. One-way ANOVA and a general linear model with repeated measures were applied to investigate the alterations in major parameters. Independent-samples *t*-test was performed to evaluate the factors predicting peak levels of UA after surgery.

**Results.** Increased UA levels were detected in all patients following surgery. The peak levels of UA were appeared at one-week follow-up ( $P < 0.05$ ), then declined significantly at one-month, and with no statistical differences at 3-month compared with baseline levels. No

significant difference was found regarding the shape of UA curves over follow-up time between normal UA group and hyperuricemia group. It revealed a lower levels of UA, creatinine and LDL-C to be independently association with peak levels of UA at one-week following surgery.

**Conclusions.** Transient elevation of UA levels occurs within 3 months after surgery and decreases to preoperative levels at 3-month. The shape of UA level curve over follow-up was not associated with preoperative levels. UA level monitoring approach is suggested in postoperative short-term following surg

#### A410

##### **A dose-dependent effect of aqueous leaf extract of *Annona squamosa* (L.) leaves on body weight gain, food intake and insulin sensitivity in high-fat diet-induced obesity.**

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Obesity is a risk factor for various conditions and diseases including insulin resistance (IR), and type 2 diabetes (T2D). Although, there are several therapeutic strategies to reduce the morbidity and mortality rate for obesity and T2D, the prevalence for these diseases are continuously on the rise. Therefore, considering the search for low-cost natural compounds for the prevention of obesity, IR and consequently T2D can be a promising alternative. This study investigated the effect of *Annona squamosa* (L.) aqueous leaf extract (AE) on obesity-induced by high-fat feeding. Male Wistar rats were treated for 9 weeks with either a vehicle or two doses of AE, 100mg/kg (low dose) and 200mg/kg (high dose), before initiating the high-fat diet feeding. Metabolic parameters were monitored throughout the study. Both doses reduced body weight (BW) gain and food intake (FI) significantly as early as the second week of treatment, however, only the low dose AE was able to preserve this effect until the end of study. Treatment with both doses reduced fasting blood glucose levels and this reduction was significant at week 6 and until the end of the treatment period. AE administration didn't improve glucose tolerance after a glucose challenge nor did it affect glucose levels in the non-fasting state throughout the study. After an insulin tolerance test, rats treated with low dose AE showed a significant improvement in their systematic insulin sensitivity. In conclusion, AE showed a dose-dependent effect and a great potential to reduce BW gain and IR in induced obesity.

#### A411

##### **Robotic One Anastomosis Gastric Bypass (ROAGB/MGB) vs Laparoscopic One Anastomosis Gastric Bypass (LOAGB/MGB)**

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**Background and aims:** One Anastomosis Gastric Bypass(OAGB) is a new and relatively simple procedure which has been shown to be effective and safe as a laparoscopic bariatric procedure. The present study aims to analyze our robotic OAGB using daVinci Xi experiences and to

compare with laparoscopic OAGB.

**Patients and Methods:** We performed over 500 LOAGB/MGB during last five years. Last 50(18M) patients with mean 48(34-69)kg/m<sup>2</sup> BMI in the LOAGB group and first 50(12M) patients with 51(39-63)kg/m<sup>2</sup> BMI in ROAGB group were included in the study. Ergonomic challenges, docking time (DT), total operative time (OT), complications (intraoperative and postoperative: early and late) and length of hospital stay were compared.

**Results:** There were no complications during surgery in both groups. There were no mortality or conversions to another approach in any patient. DT was 7(3-16)min and OT was longer for the ROAGB group (56min vs 38min, respectively, p

**Conclusion:** ROAGB/MGB seems as safe and effective as LOAGB/MGB provided that surgical team has enough experiences on the procedure. Use of robot has better surgeon positioning and reduced the ergonomic challenges of bariatric surgery especially in super-obese patients therefore it should be the procedure of choice in this group.

#### A412

##### **Adolescents proceeding to weight loss surgery have higher parent and self-rated school-quality of life**

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Medical University of South Carolina<sup>1</sup>

**BACKGROUND:** Among adolescents with severe obesity, earlier intervention with weight loss surgery (WLS) has been associated with better long term outcomes. It is unclear if quality of life (QOL) plays a role in successful completion of WLS.

**METHODS:** Adolescents seeking WLS (*M* age=15.7±1.4 years; BMI=52.49±6.12 kg/m<sup>2</sup>; 68% traditional school; 29% parent had WLS; 39% male; 54% African American, 39% Caucasian, 7% other race/ethnicity) at an academic medical center's Bariatric Program from 6/2017-1/2019 were included (*N*=28). As part of a comprehensive pre-surgical psychosocial evaluation, patients/parents completed the Pediatric Quality of Life Inventory (*PedsQL*<sup>TM</sup> 4.0 Teen and Parent Report for ages 13-18) to measure QOL in the core areas of physical, psychosocial, emotional, social and school functioning. Patients/parents were asked a single General Self-Rated Health Question (GSRH) (1=poor; 5=excellent).

**RESULTS:** Half of those evaluated went on to have WLS (*N*=14). Surgery completers had higher self (*M*=79.2 vs 56.7, *p*=0.010) and parent-rated school QOL (*M*=76.8 vs. 52.9, *p*=0.012). There were no differences between groups on GSRH, but surgery completers had significantly

higher scores on parent assessment of their GSRH (M=2.71 vs. 1.88, p=0.31).

**CONCLUSION:** Results suggest that WLS-seeking adolescents with less perceived impairment (higher school QOL and higher parent-rated health status) are more likely to go on to WLS. QOL seems to be a particularly relevant index and may be able to help teams identify patients for which a low QOL domain prevents them from proceeding to surgery. Future research may examine the post-surgical outcomes in adolescents related to QOL.

#### **A413**

##### **Proof of concept: Results of automated text messaging in reducing late cancellation and improving compliance in bariatric surgical patients**

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Arrowhead Regional Medical Center<sup>1</sup> Johns Hopkins University<sup>2</sup>

#### **Background**

Inefficient and variable patient preparation through verbal conversations and printed instruction are the main causes in poor patient compliance. The aim of our study was to assess the use of an automated text message-based platform in providing patient instructions.

#### **Methods**

We designed a structured program using the standard existing printed patient instructions. Instructions were provided automatically through time-lined text messages with a link to additional educational contents. The goal of the program was to assess the successful engagement of patients, compliance and reduction in late cancellations.

#### **Results**

A standard navigation program consisting of 13 text messages was designed. 92 data points for each patient were tracked in three different categories. Five female patients were enrolled in the program with mean age of 34.8±13.1. A total of 58 text-messages were sent, 98% were opened and 92% completed the program. The patients spent an average of 136 seconds on each navigation form. Each form was visited for an average of 1.2 times. One patient was found to be noncompliant with preoperative testing, exercise and didn't have a support system at home. Her surgery was cancelled 2 weeks prior to the surgery date. Five out of five patients highly recommended the use of this text messaging platform as a useful tool in communicating important instructions and education in the pre-operative and post-operative period.

#### **Conclusion**

Precisely designed, timely sent, bite size instructions can be promising in the preoperative care of patients. Furthermore, we demonstrated the feasibility of the platform in a real-world scenario.

#### **A414**

##### **Evaluating Use of Vitamin Patches in Bariatric Surgery Patients**

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Tulane University<sup>1</sup>

**Background:** Among bariatric surgery patients, adherence to micronutrient supplementation regimens can be challenging. Pill burden is one of the inconveniences of traditional oral supplementation thus inspiring alternative approaches including transdermal delivery of micronutrients via vitamin patches. While there are marketing campaigns recommending this route; currently, there is not any high quality data demonstrating the efficacy of vitamin patch delivery of micronutrients. We hypothesized that despite limited data, bariatric surgery patients are utilizing vitamin patches as their main source of micronutrient supplementation because of the ease of use demonstrated in marketing campaigns. **Methods:** Post-operative bariatric surgery patients living in the United States were invited to participate in an anonymous survey describing individual vitamin use. The survey was posted in online social media bariatric support groups. **Results:** Of the 480 patients included in this study, 17 (3.5%) stated that they utilized vitamin patches as part of their regimen. Among those patients, 58.9% said they would recommend using vitamin patches. 162 (33.8%) respondents said that they had heard of vitamin patches prior to the survey. Additionally, 135 (29.2%) of patients said they might and 239 (51.6%) said they would definitely be interested in using patch vitamins. **Conclusions:** This survey indicates low utilization rates for vitamin patches amongst bariatric surgery patients. However, this survey also indicates that patients are interested in using these patches. Further research is necessary to understand the efficacy of transdermal vitamins, particularly in bariatric patients who may have altered pharmacokinetics and/or transdermal absorption barriers.

#### **A415**

##### **How Do You Vitamin? Current trends in micronutrient supplementation use among bariatric surgery patients**

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Tulane University School of Medicine<sup>1</sup> Tulane University<sup>2</sup>

**Purpose:** Post-operative bariatric surgery micronutrient supplementation regimens can be cumbersome, inconvenient, and unpalatable, which presents potential barriers to adherence. While there are many studies evaluating the effects of micronutrient deficiencies there are very few studies evaluating post-operative supplement usage patterns. The purpose of this investigation is to describe micronutrient supplementation use amongst bariatric surgical patients.

**Methods:** Post-operative bariatric surgery patients living in the United States were invited to participate in anonymous survey describing vitamin use patterns. The survey was posted in online social media bariatric support groups

**Results:** Amongst the 480 respondents included in this study 452 (94.2%) were female and the

median (interquartile range) age was 49 (41-56). Four hundred thirty four (90.4%) patients said that they take their multivitamin and/or calcium/vitamin D supplements. Of these, 429 (98.8%) take multivitamins; 313 (73.0%) reported taking them daily and 73 (17.0%) reported taking them 4-6 days a week. However, adherence with calcium/vitamin D supplementation was lower with 356 (82.0%) respondents taking them. Of these, 242 (68.0%) reported daily use and 65 (18.3%) reported use 4-6 days per week. Most patients describe taking more than two supplements each day (figure 1). Each month, 135 patients spend less than \$20, 283 (59.0%) spend between \$20-50 and 62 (12.9%) spend more than \$50 to buy their vitamin supplements.

Conclusion: Micronutrient supplementation is important for post-operative bariatric surgical care. It is important to understand the current usage patterns to identify barriers to adherence and improve patient care.

#### **A416**

#### **Laparoscopic vs robotic sleeve gastrectomy in the adolescent population: an analysis of the MBSAQIP database**

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New York Institute of Technology COM<sup>1</sup> Augusta University<sup>2</sup> Arkansas Heart Hospital<sup>3</sup>

#### **Introduction:**

Laparoscopic sleeve gastrectomy (LSG) is the most commonly performed bariatric procedure in the adolescent population. However, robotic sleeve gastrectomy (RSG) is increasing in popularity. We aim to compare 30-day outcomes of LSG and RSG in adolescent patients.

#### **Methods:**

Using the MBSAQIP database, we identified patients aged 21 years and below who underwent LSG or RSG between January 1, 2015 and December 31, 2017. To adjust for confounding, LSG cases were matched (1:1) with RSG cases for age, sex, body mass index (BMI), and pre-operative comorbidities. Continuous outcomes were evaluated using independent samples t-test or the Mann-Whitney test. Categorical outcomes were evaluated using chi-square analysis.

#### **Results:**

654 patients (327 matched pairs) aged 14-21 years were included in our study. Operation length was 36 minutes longer in the RSG group compared to LSG (102.16 vs 66.38 minutes,  $p < .001$ ). RSG also led to an increased length of hospital stay (1.75 vs 1.44 days,  $p = .003$ ) and an increased rate of hospital readmissions (4.22% vs 1.27%,  $p = .049$ ) compared to LSG. 30-day reoperations for LSG and RSG (0.61% vs 1.22%,  $p = .412$ ) were comparable. No mortality, leaks, or bleeding events were observed in the first thirty days after surgery.

#### **Conclusions:**

This study indicates that both LSG and RSG can be safely performed in the adolescent population with low mortality and acceptable complication rates, although RSG did lead to increased length of stay, longer operative times, and more readmissions. Prospective trials with long-term follow up are needed to determine the safety and efficacy of RSG in adolescents.

A417

**Pediatric Bariatric Surgery in United States Centers of Excellence in Bariatric Surgery (COEBS): Variation by Age, Gender, Health Insurance, and Procedure**

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Inspira Health Network<sup>1</sup>

**Introduction:** Data on pediatric bariatric patients at United States COEBS is evolving.

Objective: Identify clinical variation in adolescents at US COEBS.

**Methods:** Retrospective data from 341 US COEBS adolescents analyzed using ANOVA and general linear model.

**Results:** Female (n=267)/male (n=74) pre-operative weight (125+-24/162+-35 kg), BMI (45+-8/53+-12), dyslipidemia (11%/22%), OSA (24%/41%), CPAP (9%/22%), medicated back pain (MBP) (12%/22%) and private insurance (81%/72%) (p<0.05). 6, 12 and 24-month post-operative OSA (16%/36%), (12%/34%) (p<0.01) and (4%/33%) (p<0.05). 6-month CPAP (7%/19%) and MBP (6%/15%) (p<0.05).

Pre-operative private insurance (n=270)/non-private (n=31), weight (130+-2/147+-5kg), BMI (46+-1/54+-2), diabetes (17%/42%) (p<0.001), OSA (28%/48%), depression (25%/42%), Caucasian (68%/45%), female (82%/94%) (p<0.05). BMI at 6 and 24 months (39+-0.4/42+-1, 35+-4/27+-1) (p<0.05), 6 and 18-month diabetes (9%/29%, 5%/40%), 6-month OSA (18%/44%), CPAP (9%/21%) medicated asthma (MAS 9%/21%) (p<0.05).

By pre-operative age <16 (n=47)/≥16 (n=285), weight (122+-25/134+-31kg (p<0.01) varied. BMI (45+-8/47+-10, p=0.057), dyslipidemia (26%/11%), OSA (40%/26%), alcohol (3%/15%) and MBP (30%/11%) did not. 6-month post-operative MBP (18%/6%), 6/12-month alcohol (13%/3%)/(2%/22%), 18-month dyslipidemia (25%/6%) (p<0.05) varied.

Baseline LRYGB/LAGB/SLEEVE weight (143+-3/125+-2/130+-4kg), BMI (50+-1/45+-1/47+-1), OSA (35/19/36), CPAP (19/6/11), MAS (28/8/18), back pain (35/28/18), MBP (19/11/4), depression (22/26/38), private insurance (73/83/76), Caucasian (56/75/60) varied (p<0.05). 6-Month OSA, depression (p<0.05) and 18-month asthma (p<0.01).

**Conclusions:** US COEBS adolescent males have increased weight, dyslipidemia, OSA, CPAP, and less private insurance. Patients with private insurance weigh less with fewer comorbidities but have higher comorbidity resolution. Younger patients (<16) weigh less and use less alcohol but have more comorbidities compared to ≥16. LRYGB have increased weight/BMI/comorbidities versus LAGB/SLEEVE but resolve comorbidities equally.

**A418**

**Prospective Characterization of Adolescents and Young Adults with Intellectual Disability Presenting for Bariatric Surgery**

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**Background**

Metabolic and bariatric surgery (MBS) is the most effective treatment for adolescent severe obesity, but is rarely considered for youth with intellectual disability (ID). Current MBS guidelines lack specificity for evaluating youth with ID and research is limited in characterizing this population.

**Objective**

To determine the level of functioning, health, and psychosocial characteristics of adolescents/young adults with ID presenting for MBS

**Setting**

A single multidisciplinary adolescent MBS center

**Methods**

A prospective observational design was used as part of a larger, longitudinal study. Patients age 10-25 with diagnosed or suspected ID were screened. Participants/parents completed validated measures of intellectual (IQ) and adaptive functioning, parenting stress, and quality of life (QOL).

**Results**

Of 76 patients presenting for surgery since June 2017, 11% (n=8) were consented. Participants were all female with mean age of 17 (13-22), 75% had class 3 severe obesity, and 63% had either type 2 diabetes or prediabetes. ID etiology included autism, nonaccidental trauma, and craniopharyngioma. Mean IQ was 77 ("average intelligence"=100), and ranged from 64-91. Mean adaptive function, reflecting practical life skills, was 83 ("average"=100) and ranged from 67-111. Mean parenting stress was considered normal at the 57th%ile (range 3<sup>rd</sup>-99<sup>th</sup>%ile). Mean parent-reported QOL for their child was 60 on a scale of 0-100 (range 28-98).

**Conclusion**

Adolescents/young adults with ID presenting for MBS show significant variability in etiology and severity of ID and in personal and family functioning domains. Such variability presents opportunities to tailor pre and post-operative care to optimize the safety and efficacy of MBS.

**A419**

**Outcomes of Pain Control in Post-Op Laparoscopic Gastric Sleeve Patients on Either a Narcotic or a Non-Narcotic Regimen: A Retrospective Study**



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This study was conducted to compare the perceived postoperative pain after laparoscopic gastric sleeve surgery in patients who followed a postoperative narcotic versus non-narcotic pain regimen. The hypothesis was that there would be better postoperative pain control and recovery time in the nonnarcotic group as compared to the narcotic group. 400 patients were included in this study, with 200 individuals in the nonnarcotic arm and 200 in the narcotic arm. The nonnarcotic protocol included a TAP block, celecoxib, gabapentin, ketorolac, and acetaminophen. Through phone call surveys, the patients included in the study self reported their perceived levels of postoperative pain, time it took to return to their normal level of activity after surgery, and postoperative nausea levels to determine effectiveness of each pain control protocol. On average, patients in the nonnarcotic group reported a postoperative pain level in the hospital of 4.0/10 and postoperative pain level at home of 2.9/10. In the narcotic arm, the average numbers were 4.5/10 and 3.6/10, respectively. Patients in the nonnarcotic arm reported an average recovery time of 18.9 days, whereas patients in the narcotic arm reported an average recovery time of 35.3 days. This was statistically significant ( $p=0.0248$ ). This study supports the hypothesis that a nonnarcotic regimen may be more effective than a narcotic regimen in post op pain control, and that nonnarcotic medications improve recovery time after a laparoscopic sleeve gastrectomy procedure.

## A420

### **The Effect of Sleeve Gastrectomy on The Uncoupling Proteins in Animal Rat Model**

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### **Introduction**

Uncoupling proteins play an important role in mitochondrial inducible proton leak. They are the potential target for treating obesity and its related disease such as Type II Diabetes Mellitus. In this study we aim to know the effect of sleeve gastrectomy on various uncoupling protein such as UCP 1, UCP 2 and UCP 3 in brown adipose tissue (BAT) as well as other tissues such as White adipose tissue (WAT), Liver and Muscle by western blotting, Immunohistochemistry (IHC) and mRNA Expression.

### **Method**

Sprague Dowley male rats (4 weeks old) were divided in two groups: Control and Diet Induced Obesity (DIO). The control group (n=9) were fed ad libitum regular rat chow and water. The DIO group (n=14) were fed ad libitum "Cafeteria Diet". DIO group were subdivided into 2 sub-groups at 21 weeks i.e SHAM(n=9) and sleeve gastrectomy(SG)(n=5). Animals were fasted 12-15 hours prior to surgery. Animals were sacrificed at 30 days post-surgery for collection of

various tissues.

### **Result**

By Western Blotting Upregulation of UCP 1 in BAT was observed in SG animals as compared to control and Sham animals, Significant difference seen between SG and control animals ( $P < 0.05$ ). No Significant difference was observed in UCP 2 and UCP 3 in BAT of control, sham and SG animals. IHC observation showed the same trend of expression of UCP 1 as in western blotting.

### **Conclusion**

We anticipate bariatric surgery upregulates the uncoupling proteins. This anticipation needs further investigation of the UCPs in various tissue to confirm our findings.

### **A421**

#### **Laparoscopic Roux-en-Y Gastrojejunostomy Stricture, Serial Dilation, and Perforation: A Case Report and Review of Literature**

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We present a case of a 33-year-old female that underwent a laparoscopic Roux-En-Y gastric bypass 5 months prior that subsequently developed a gastrojejunostomy stricture treated with endoscopic balloon dilation. Following her third balloon dilation she developed severe abdominal pain and was found to have free air on an upright abdominal x-ray. The patient was immediately brought to the operating room for a diagnostic laparoscopy which demonstrated an anterior perforation of the gastrojejunostomy anastomosis. The decision was made to revise the anastomosis by performing a stricturoplasty where the perforation was extended longitudinally and closed transversely with interrupted silk sutures to both repair the perforation and resolve the anastomotic stricture. The patient had an uncomplicated postoperative course.

Gastrojejunostomy strictures are a common complication after laparoscopic Roux-En-Y gastric bypass. There are multiple factors that may lead to the formation of a stricture including marginal ulcers or technical error. Anastomotic strictures are often managed endoscopically with serial balloon dilations. However, if endoscopy fails to relieve the stricture, the patient may need to undergo a laparoscopic gastrojejunostomy revision, which can be morbid. Additionally, anastomotic perforation represents a surgical emergency that warrants immediate exploration. This case presents a unique situation where both situations are present and more conservative measures such as endoscopic stenting are not feasible. By performing a revision stricturoplasty, we attempted to repair the perforation as well as lengthen the anastomosis to relieve the stenotic area.

### **A422**

## Laparoscopic Adjustable Gastric Banding: Long-Term Outcomes and Relationship to Band Removal

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**Background** – Laparoscopic adjustable gastric banding (LAGB) is a safe and reversible means of weight loss, but the number being performed has decreased. We identified patients who underwent LAGB and determined those who have had band removal. We hypothesized that band removal correlated with poor weight loss or complications.

**Methods** – We analyzed a bariatric database of patients who underwent LAGB at our institution over 12 years. Data points including age, sex, body mass index (BMI), and comorbidities were collected. We calculated patient EWL and noted any complications or revisions.

**Results** – From 2004 to 2016, 383 LAGB procedures were performed. Thirty-seven patients (9.7%) had band removal. Complications occurred for 55 patients (14.4%). Complication rates among patients who had the band removed were higher 37.8% (14/37) than those who did not 11.8% (41/346), ( $p < .001$ ). The majority (62.2%) of patients who had the band removed did not experience complications. Gastric prolapse ( $n=4$ ) and band failure ( $n=4$ ) were the most prevalent complications resulting in band removal.

**Conclusion** – Band removal was largely arbitrary and could not be attributed to one factor. Patients who had band removal showed greater EWL than patients who did not. Moreover, 44.78% of patients who underwent reoperations and 74.55% of patients with complications did not undergo band removal. We found a significant difference in gastric prolapse and band failure in patients who had the band removed. However, that difference does not overshadow the fact that most patients who underwent band removal did so without prior complications.

A423

### Bariatric surgical success and associated factors in Brazilian women from two to seven years after Roux-en-Y gastric bypass

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University of Brasilia<sup>1</sup>

Objective: To evaluate the surgical success and associated factors in women from two to seven years after Roux-en-Y gastric bypass (RYGB). Methods: Anthropometric and socio-demographic data from 86 women were assessed. Surgical success was defined as the presence of three concomitant parameters: excess weight loss  $\geq 50\%$  (%EWL), stable body weight (weight regain (WR) less than 10% from the lowest postsurgical weight) and control of comorbidities (diabetes and dyslipidemia, evaluated by biochemical tests, and hypertension, measured by automatic device). Results: Only 23% of the sample had surgical success by these parameters. Although 90% of patients showed an optimal %EWL, almost 40% presented obesity-related comorbidities and 58% showed WR. Age and educational level did not influence surgical success (Mann-Whitney U test;  $p=0.26$ , for both variables), as well as if the surgery was performed in private or public health system (Chi-square test;  $p=0.13$ ). The postoperative period was marginally different between success and no success group (Mann-Whitney U test;  $p=0.09$ ),

however there was a positive correlation between months postoperative and WR ( $r=0.38$ ;  $p<0.001$ ). Conclusion: Despite a high frequency of adequate %EWL, the comorbidities and WR may have influenced bariatric surgical success. Age, educational level and surgery in private or public system were not associated with bariatric surgical success. The postoperative time, an important predictor of long-term bariatric surgical success, showed a positive correlation with WR, suggesting the importance of efficient clinical follow-up in the late postoperative period, aiming at the control of body weight.

#### **A424**

### **Short Term Outcomes of Bone Health Following Laparoscopic Sleeve Gastrectomy in Asians**

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National University Health System<sup>1</sup>

#### **Introduction**

Laparoscopic sleeve gastrectomy (LSG) is an effective treatment for obesity. Bone health related nutritional deficiencies have not been well studied in Asian bariatric populations.

#### **Aim**

Our study aims to identify factors affecting baseline bone health in an Asian bariatric population and compare bone health at baseline and 1-year post-sleeve gastrectomy.

#### **Methods**

This is a retrospective analysis of 127 patients undergoing LSG at a tertiary institution in Singapore between 2012 and 2018. Patient demographics, bloods markers and bone densitometric measurements were compared pre- and 1 year post-operatively. Analysis was also done to identify factors that predict for 25-OH Vitamin D deficiency.

#### **Results**

There were 79 females and 48 males. The mean age was 44.5 ( $\pm 11.5$ ) years and mean pre-op Body Mass Index (BMI) 41.6 ( $\pm 6.7$ ) kg/m<sup>2</sup>. Pre-operatively, 25-OH Vitamin D deficiency ( $<10\text{ng/mL}$ ) was seen in 36/127 (28.6%) and insufficiency ( $<30\text{ng/ml}$ ) in 125/127 (98.4%). On univariate analysis, female gender, Indian race and class III obesity were significant predictors for baseline 25-OH Vitamin D deficiency. Table 1 shows a comparison of bone health markers.

#### **Conclusion**

Deficiency in all bone health markers improved significantly post-bariatric surgery. Vitamin D deficiency is highly prevalent in Asian bariatric population. Female gender, Indian race and class III obesity predict for vitamin D deficiency and thus, post-operative supplementation should be more stringent and compliance emphasized for them.

**A425**

**Project JA: a novel approach to stimulate a positive attitude from children to fruits and vegetables consumption and to the movement**

Romina Pereiro *Buenos Aires*

Fundacion alco

Background and objectives: Consumption of fruit and vegetables among children is generally below recommended levels. In addition it has been shown that only 1/3 of high school students get the recommended levels of physical activity. Different interventions have been demonstrated to be of help in stimulating fruit and vegetables consumption and movement in children. The objective of this presentation is to show the methodology, design and participation results of a recreational intervention developed in Argentina during 2016: Project JA • Methods: A pilot program was developed during 2015, through 7 presentations in 6 schools. Following this pilot program a definitive interactive workshop has been developed by a team conformed by physician, nutritionist, physical education teacher with the collaboration of a scriptwriter. The workshop includes a performance with dances and interactive games with the children's participation lasted 45 minutes, following by 20 minutes exchange of professionals and children and photographs. Fruits colors and movement games and activities were emphasized • Results: From March 2016 to January 2017, 200 workshops were performed in 71 schools and other places (hospitals and sciences expo) at 29 cities in the 24 Argentinean provinces, with participation of around 25000 children aged 6-12. Twenty six thousand brochures and 30000 fruit units were brought to the participants and teachers. A brief video will be shown, including the most popular moments of the workshop and participant's interviews regarding the workshop • Conclusions: The methodology chosen for the workshop had a great acceptance by the participant children and the teachers and a positive approach to fruits and vegetables consumption and to movement has been perceived.

**A426**

**Feasibility and Safety of Robot-Assisted Bariatric Conversions and Revisions**

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**Background:** Conversions and revisions after bariatric procedures are inevitable and associated with longer operative time and higher complication rate. Because of good dexterity, robot-assisted conversions and revisions may be less taxing to the surgeon than the laparoscopic ones. This study aims to compare the feasibility and safety of robotic conversions and revisions to laparoscopic procedures.

**Methods:** A retrospective chart review was performed on 94 consecutive patients who underwent a bariatric conversion or revision (revision of gastrojejunostomy, conversions of vertical sleeve gastrectomy[VSG] to Roux-en-Y gastric bypass[RYGB], gastric banding to VSG, RYGB to VSG, gastric banding to RYGB, RYGB to duodenal switch[DS], and gastric banding to DS between Jan 1<sup>st</sup>, 2017, and Feb 28<sup>th</sup>, 2019. Of these, 29 underwent a robotic conversion or revision.

**Results:** Patients who underwent a robotic procedure were more likely to be older (48.1 vs. 42.3 years old) and lighter (44.3 vs. 50.4 kg/m<sup>2</sup>) than patients who received a laparoscopic procedure. The mean operative time was longer in the robotic group (155.5 min) than in the laparoscopic group (113.3 min). No difference was observed between the two groups in the mean length of hospital stay, 30-day readmission rate, or 30-day reoperation rate. Results were similar when the baseline difference in age and body mass index were accounted for.

**Conclusions:** Robotic conversions and revisions were as feasible and safe as laparoscopic procedures. Although the operative time was longer, robotic conversions may be beneficial for the surgeon's posture and muscle strain.

#### A427

##### **Gender Differences in the Pattern of Depressive Symptoms in Pre-Surgical Bariatric Patients**

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Staten Island University Hospital<sup>1</sup>

**Introduction:** Multiple factor structure models have been proposed to explore the utility of the Beck Depression Inventory-II (BDI-II) within the bariatric surgical population. However, none of these factor structure models have examined gender differences, although research shows that gender and depression each may impact successful recovery among individuals seeking bariatric surgery.

**Objectives:** The aim of this project was to analyze gender differences in the factor structure of the BDI-II in preoperative bariatric patients.

**Methods:** Confirmatory factor analyses (CFA), based on Vanheule et al. (2008) and Hayes et al. (2014), were run on BDI-II responses (N = 172; Female = 124; Male = 48). An exploratory factor analysis (EFA) was conducted to investigate factor structures that more accurately assess gender specific depressive symptom profiles in individuals seeking bariatric surgery.

**Results:** Fit statistics for all models were robust. CFA results did not support the previously proposed 3-factor models. EFA for females yielded a two-factor solution of Negative Depressive Symptoms and Positive Depressive Symptoms, explaining 82% of the variance. EFA for males yielded a three-factor solution of Feelings of Despondency, Socio-emotional Comorbidity, and a Mortality Risk Factor, explaining 84% of the variance.

**Conclusion:** The results suggest that a 2-factor model in females and a 3-factor model in males sufficiently account for the pattern of depressive symptoms in this sample. Elevation in one or more of these factors may assist in identifying patients needing preoperative intervention and those who are at higher risk for struggling with postoperative behavior changes.

#### A428

##### **Adherence to health care appointments is associated with weight loss following bariatric surgery**

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Henry Ford Health System<sup>1</sup>

Many bariatric surgery programs consider adherence to health care appointments necessary to provide optimal care and evaluate long-term outcomes. This study examined the relationship between pre- and post-operative adherence to appointments and weight loss.

Participants ( $N=210$ ) included patients who underwent sleeve gastrectomy or Roux-en-Y gastric bypass. A retrospective chart review was used to determine percentage of canceled, “no-showed,” and completed appointments two years prior to and 1 year after bariatric surgery. Weight outcomes at 1-year ( $\pm 3$  months), including change in BMI ( $\Delta$ BMI), percent total weight loss (%TWL), and percent excess weight loss (%EWL) were calculated.

Participants were predominantly female (84.3%), Caucasian (49%) or African American (42.4%), with a mean age of 46 years and pre-surgical BMI of 46. Approximately half (45.7%) of patients did not attend their 1-year surgical follow-up appointment. A higher rate of canceled post-operative bariatric appointments was related to lower  $\Delta$ BMI ( $\beta = -.17, p = .029$ ) and %TWL ( $\beta = -.17, p = .037$ ), but not %EWL. Pre-operative “no-shows” were inversely related to completed post-operative bariatric appointments ( $\beta = -.14, p = .045$ ) and predicted more post-operative “no-shows” ( $\beta = .34, p < .001$ ). Younger age predicted higher rates of “no-shows” ( $\beta = .22, p = .002$ ) and fewer completed appointments ( $\beta = .14, p = .049$ ).

There are high rates of nonadherence to bariatric appointments in the year after surgery. Pre-surgical nonadherence to health care appointments may predict nonadherence to post-surgical bariatric appointments. Future research could examine ways to improve retention of bariatric patients as post-operative nonadherence to appointments may be associated with less weight loss.

#### **A429**

##### **Use of a hands-free intracorporeal retractor for suture-based liver retraction during laparoscopic bariatric procedures: Results a large case series.**

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Menorah Medical Center<sup>1</sup>

##### **Background**

Laparoscopic bariatric surgery requires retraction of the left lobe of the liver to provide adequate operative view and working space. Conventional approaches utilize a mechanical retractor that requires a dedicated incision, may cause liver damage, and often requires an assistant. This study evaluated the safety and efficacy of hands-free intracorporeal retractors in a large series of

subjects undergoing laparoscopic bariatric surgery. This method eliminates the need for a subxiphoid incision, enables full surgeon autonomy, and allows for adjustments throughout the procedure.

### **Methods**

Retrospective chart review identified all subjects at a single hospital undergoing bariatric surgery between September 2017-March 2019 for whom suture-based liver retraction was selected. In this procedure, the left lobe of the liver was lifted by anchoring one fixed hook into the right crus and the two adjustable hooks into the insufflated abdominal wall to provide adjustable retraction of the left lobe of the liver.

### **Results**

In all, 527 cases were identified. Patients had a high rate of morbid obesity (80% with BMI >40 kg/m<sup>2</sup>) and most were female (84%). The most common bariatric procedures were Roux-en-Y gastric bypass (49.9%) and sleeve gastrectomy (49.1%). No injuries to the liver were noted. Only 2 procedures (0.4%) required more than 5 trocars and a subxiphoid incision. Three procedures (0.6%) required a second retractor.

### **Conclusions**

Suture-based liver retraction using the hands-free intracorporeal retractors was found to be safe and effective in this large case series of subjects with morbid obesity. No complications involving the technique were identified.

## **A430**

### **Patient Perspectives on Post-Bariatric Surgery Nutritional Supplementation**

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Loyola Stritch School of Medicine<sup>1</sup> Loyola University Medical Center<sup>2</sup>

**Introduction:** Bariatric procedures increase patient risk of long-term metabolic complications primarily due to nutrient deficiencies. The mainstay of prevention includes routine vitamin and mineral supplementation, however, barriers to patient compliance with therapy are poorly understood.

**Methods:** An 11-point outpatient survey was electively administered to post-bariatric surgery patients at a single institution. All patients underwent either laparoscopic sleeve gastrectomy (SG) or gastric bypass (GB). At the time of survey, patients ranged from 1-month to 5 years from surgery. Survey items consisted of dichotomous (yes/no), multiple choice, and open-ended free response questions. Descriptive statistics were evaluated.

**Results:** Of 94 respondents, 52 (55%) underwent SG, and 42 (45%) underwent GB. Most patients reported routine use of a bariatric specific (67%) or an over the counter brand (24%)



supplement. 90% of patients reported that insurance did not cover their supplement cost. Calcium supplementation was reported in 88% of patients, however, use varied. Most patients reported daily compliance (82%). However, in those who were unable to take vitamins daily, non-compliance was attributed most commonly to forgetting (67%), and less often due to side effects (24%), cost (5%), or taste (4%). Strategies for remembering to take vitamins included use of a pill box (29%), same time daily (28%), alarm reminder (15%), and tying into daily routine (18%).

**Conclusions:** Post-bariatric surgery nutritional supplementation compliance remains challenging due to several factors. Although insurance coverage remains limited, cost does not appear to be a significant contributor to non-compliance. Incorporation of daily reminder strategies may lead to improved overall compliance.

#### A431

##### **A Simple Opiate Free Recovery Initiative for Bariatric Surgery in the Community Setting**

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**It is common practice to treat post-operative pain with prescription opioids after surgery. This can result in a increased risk of long-term opioid dependence and exposure to significant side effects. Our aim is to initiate an opioid free initiative to reduce these risks while maintaining a high level of patient care.**

**This is a retrospective review from a community hospital of patients who underwent laparoscopic weight loss procedures and were placed on an opiate free enhanced recovery protocol. All patients were given a bilateral TAP block under direct visualization with 30ml 0.5% Marcaine and 20mL of 1.3% Exparel mixed in 100cc NS. Post-operatively, all patients receive standing IV Tylenol and Toradol with oxycodone 5mg given for breakthrough pain. The patient is discharged home with the same number of oxycodone required during the hospital stay.**

**115 patients were included in the study, 37 prior to initiation of the protocol. These patients were prescribed an average of 14.8 opiate pills on discharge with an average of 2.61 taken per person. Following initiation, patients were prescribed an average of 3 pills with and average of 0.6 taken. This stark drop in opiate utilization shows success of the opiate free protocol.**

**This project demonstrates the efficacy of our simple, easily reproducible enhanced recovery protocol. We successfully decreased the number of opiate prescriptions without sacrificing patient care. This protocol is easily followed in the community setting and can change the views of surgery and the stigma of pain during recovery.**

**A432**

**OUTCOMES IN RACIAL COHORTS AFTER ROBOTIC-ASSISTED ROUX-EN-Y GASTRIC BYPASS: A MATCHED ANALYSIS OF THE MBS-AQIP PUF DATABASE**

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Temple University Hospital<sup>1</sup> Temple University<sup>2</sup> Mayo Clinic<sup>3</sup>

**Introduction:** Robotic-assisted metabolic and bariatric surgery (MBS) is increasingly performed. Clear benefits have yet to be established and outcomes studies vary in results. Very little is published on outcomes of robotic-assisted MBS in racial cohorts. Our study goal was to determine outcomes following robotic-assisted gastric bypass (RGB) among racial cohorts.

**Methods:** Using the 2015-2017 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database, we identified primary RGB cases using Current Procedure Terminology (CPT) codes 43644 and 43645. Selected cases were further stratified by race. 1:1 case-control matching was performed comparing racial cohorts. Cohorts were matched by patient demographics and preoperative comorbidities.

**Results:** Between 2015 and 2017, RGB cases increased by 3%. Of the 8,719 RGB cases included in this analysis, 69%, 15% and 10% were performed in White, Black and Hispanic patients, respectively. After matched analysis (n = 2,666), outcomes were similar between Black and White patients, except for a longer operative duration (p = 0.0008), length of stay (LOS) (p = 0.001), and a higher rate pulmonary embolism (PE) (p = 0.04) in Black patients. Outcomes after matched analysis of Hispanic and White patients (n = 1794) were also similar, except a longer postoperative LOS in Hispanic patients (p = 0.007).

**Conclusion:** Robotic-assisted gastric bypass is increasingly performed and remain overall safe. While a higher proportion of cases are performed in White patients, outcomes between racial cohorts are mostly similar. The reasons for higher operative length, LOS and PE in Black MBS patients need further study.

**A433**

**OUTCOMES IN RACIAL COHORTS FOLLOWING ROBOTIC-ASSISTED SLEEVE GASTRECTOMY: AN MBS-AQIP MATCHED COHORT ANALYSIS**

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Mayo Clinic<sup>1</sup> Temple University Hospital<sup>2</sup> Temple University<sup>3</sup>

**Introduction:** Robotic-assisted metabolic and bariatric surgery (MBS) is increasingly performed. The indications for and benefit of robotic-assisted sleeve gastrectomy (RSG)

compared to conventional laparoscopy remains unclear. Little is known about perioperative outcomes among different racial cohorts undergoing RSG. The goal of our study was to evaluate outcomes following RSG between racial cohorts.

**Methods:** Using the 2015-2017 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database, we identified primary RSG patients, after excluding revision, non-robotic cases and cases with missing data. Included cases were further stratified by race. A 1:1 case-control matching was performed of racial cohorts, comparing Black vs. White and Hispanic vs. White patients. 8,328 RSG cases were identified for the comparison between Whites vs. Blacks and Whites vs. Hispanics.

**Results:** Between 2015 and 2017, RSG cases increased by 17%. Of 21,298 RSG cases analyzed, 62%, 21% and 11% were performed in White, Black and Hispanic patients, respectively. After matching (n = 8,164), outcomes between Black and White patients were similar, except for longer operative duration (p=0.02), length of stay (p < 0.0001), and a higher readmission rate in Black patients. Outcomes were similar between matched (n = 4852) White and Hispanics patients (Table 1).

**Conclusion:** While indications for RSG remain ill-defined, it is safely performed among racial metabolic and bariatric surgery cohorts. Despite undergoing RSG at disparate rates, primary and aggregate outcomes were mostly similar between racial cohorts. The reasons for higher operative time, length of stay and readmission in black patients need further exploration.

A434

**Pilot evaluation of a multidisciplinary strategy for laparoscopic sleeve gastrectomy in adolescents with obesity and developmental delay**

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**Background**

Recent ASMBS guidelines suggest that developmental delay (DD) is not a contraindication to laparoscopic sleeve gastrectomy (LSG) in adolescents with obesity. While the data are sparse, there is no evidence of increased complications in this group. Nevertheless, medical, behavioral, and ethical factors may impede optimal bariatric care. We report preliminary outcomes of a multidisciplinary strategy to manage this population with LSG.

**Methods**

This pilot program began in January of 2018 to use LSG as a management option for adolescents with obesity and DD. A retrospective review was performed of patients enrolled to date to describe presenting features and outcomes.

**Results**

Between January of 2018 and May of 2019, 6 patients with obesity and DD received LSG (Table

1). Five (83%) were male with median age of 15.5 years (range 11-22 years). Developmental conditions included autism (n=2), Down's syndrome (n=1) and other (n=3). Five patients (83%) presented with medical (not obesity-related) and psychiatric comorbidities. Three patients (50%) received ethics consultation preoperatively to assess surgical assent. Median initial BMI was 47 kg/m<sup>2</sup> (range 41-60 kg/m<sup>2</sup>). Six months postoperatively, median BMI was 44 kg/m<sup>2</sup>(range 42-45 kg/m<sup>2</sup>), median percent excess BMI loss was 41% (range 40-41%) and median percent total weight loss was 18% (range 12-22%). One postoperative complication of seizure activity in a patient with a known seizure disorder resolved. All patients have been compliant with dietary changes and medications.

### **Conclusions**

Adolescents with obesity and DD may be successfully managed with LSG. Multidisciplinary management and ethics consultation facilitate optimal bariatric care.

## **A435**

### **Laparoscopic Sleeve Gastrectomy Is Successful in Decreasing Weight and Insulin Requirements in Patients with Type I Diabetes Mellitus**

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University of Vermont Medical Center<sup>1</sup>

#### **Background:**

While there exists robust data to suggest that laparoscopic sleeve gastrectomy (LSG) is successful in the treatment of type II diabetes mellitus, there remains a paucity of evidence on the use of this surgery in patients with type I diabetes mellitus (T1DM). Previous literature looking into bariatric surgery for patients with T1DM has primarily focused on Roux-en-Y gastric bypass, which is now less commonly performed than LSG in the United States.

#### **Methods:**

This is a retrospective review of all patients at a single academic medical center with T1DM who underwent LSG from 2010-2018. Primary outcome was reduction in insulin use. Secondary outcome was longitudinal weight loss.

#### **Results:**

Five patients met criteria for inclusion. All had a diagnosis of morbid obesity; additional comorbidities included obstructive sleep apnea, osteoarthritis, coronary artery disease, and end-stage renal disease. Average preoperative weight was 119.8kg, with mean ideal body weight of 64.9kg. Average weight loss was 21.6kg (16.8%) after 1 year and 34.0kg (25.4%) after 2 years. One patient met criteria for kidney/pancreas transplantation as a result of their weight loss. Three patients had an average decrease in insulin requirement by 64.1% (Std dev 7.9%). One patient's insulin requirements were not recorded at follow-up. None of the patients experienced postoperative death or major complications from their T1DM or LSG.

#### **Conclusions:**

Patients who have T1DM and morbid obesity benefit from LSG for weight loss and decreasing insulin requirements. Larger studies are needed to continue to explore the role LSG may serve in this patient population.

#### A436

### **Different surgical techniques that influence internal hernia rate after Laparoscopic Roux-en-Y gastric bypass : a retrospective analysis of 331 cases.**

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Jinan University<sup>1</sup>

#### Background:

Internal hernia (IH) is a serious complication following laparoscopic Roux-en-Y gastric bypass, The main aim of this study was to compare the incidence rate of internal hernia after Laparoscopic Roux-en-Y gastric bypass (LRYGB) for different patient characteristics and surgical techniques.

#### Method:

This study was a retrospective analysis of 331 patients who underwent laparoscopic gastric bypass surgery between June 2004 and Dec 2017 in the First Affiliated Hospital of Jinan University. All of the operations were performed by the same surgical team. Mean follow up=36±12 months. Minimum follow up was 12 months. 331 cases were evaluated the IH rate depends on the different patient characteristics and surgical methods using Chi-square or Fisher's exact test.

#### Results:

331 cases were divided into every two groups by the different patient characteristics and surgical methods. According to the suture technique, there are 157 cases of interrupted sutures group, 5 cases of internal hernia occurred; 174 cases of running suture group, no internal hernia occurred ( $p < 0.05$ ). According to the relative orientation of Roux limb and transverse colon, there are 50 cases used antecolic approach, no internal hernia occurred; 281 cases used retrocolic approach, 5 cases of internal hernia occurred ( $p > 0.05$ ). And there are 253 cases used absorbable suture, 4 cases of internal hernia occurred; 78 cases used non-absorbable suture, 1 case of internal hernia occurred ( $p > 0.05$ ).

#### Conclusion:

Compare with the interrupted suturing, Running suture closure may prevent internal hernia occurring after LRYGB. But there still needs more solid evidence to support this conclusion.

#### A437

### **Endoscopic hydrostatic balloon dilation versus pneumatic dilation for post-sleeve gastrectomy symptomatic gastric stenosis: A multicenter experience**

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Mayo Clinic<sup>1</sup>

**Background:** Gastric stenosis (GS) is a potential adverse event after sleeve gastrectomy (SG). Different endoscopic interventions are available with no clear guidelines. Our aim was to

compare the treatment efficacy and safety between hydrostatic and pneumatic balloon dilation for post-SG symptomatic GS.

**Methods:** Consecutive patients with SG post-SG, presenting between January 2014 and December 2018 who underwent endoscopic hydrostatic and/or pneumatic balloon dilatations at 3 Mayo Clinic sites were included in this retrospective study. Each patient may receive more than one endoscopic treatment. GS was classified according to the barium study or endoscopy to stricture, angulation or twist. Treatment success was defined as improvement of symptoms that allowed the patient to avoid further intervention.

**Results:** There were 20 patients in the pneumatic group and 33 patients in the hydrostatic group. The treatment success rates were not significantly different between the pneumatic and the hydrostatic group after single dilation (40% vs. 57.6%,  $p=0.22$ ); or multiple dilations (65% vs. 63.6%,  $p=0.92$ ) with the mean numbers of dilations of  $1.6\pm 1.1$  and  $1.2\pm 0.5$ , respectively ( $p=0.11$ ). For complications, one esophageal tear and one esophageal perforation were observed in the pneumatic group whereas none was observed in the hydrostatic group. Patients with the subtype of angulation had a numerically higher treatment success with pneumatic than hydrostatic balloon dilatations (87.5% vs. 67%).

**Conclusions:** Our study demonstrated that both pneumatic and hydrostatic balloon dilations have comparable treatment success. However, hydrostatic dilation has a better safety profile. Pneumatic dilation may have a better treatment efficacy for gastric angulation.

## A438

### Contextualização da Obesidade Mundial e Brasileira

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Faculdade Maurício de Nassau

A obesidade é apresentada como uma doença crônica não transmissível, e está concernente a outras co-morbidades, (MARTINS, et al. 2016). A *World Health Organization (2018)* e que pode ocasionar doenças cardiovasculares, distúrbios músculos esqueléticos, alguns tipos de câncer. Melo (2011), complementando essa informação apontamos algumas outras doenças como, síndrome metabólica, diabetes Milito tipo 2, doenças respiratórias, osteoartrose, doenças psiquiátricas, doença hepática gordurosa não alcoólica, pancreatite aguda, doença do trato digestório.

De acordo com a Diretriz Brasileiras de Obesidade (2016), estas condições descritas a cima, retrata cerca de 8% do total de gastos em saúde pública no Brasil, envolvendo custos indiretos associado ao desligamento do trabalho, absenteísmo e aposentadoria, mas antecipados com indivíduos com obesidade, mas sabemos que um dos melhores investimentos para se combater a obesidade, é em atividades físicas ou exercícios físicos e profissionais de educação física, capacitado para tal.

A obesidade pode ser causada por diversos fatores como, a influência do ambiente, que lavam a diminuição no grau de atividades físicas, e conseqüentemente crescimento na ingestão calórica, fatores ambientais muito forte, estilo de vida urbano moderno ( por cauda da genética), efeito do estresse no apetite ( não considerando a obesidade como um transtorno psiquiátrico), Iatrogenia farmacêutica, redução de sono e de produção de melatonina, disruptores endócrinos,

ambientes termoneutro, aumento da idade das grávidas, obesidade de origem infecciosa, e poluição (DIRETRIZ BRASILEIRAS DE OBESIDADE, 2016).

#### **A439**

##### **Safety of prophylactic cholecystectomy at the time of bariatric surgery: a systematic review and meta-analysis**

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Queen's University<sup>1</sup>

Obesity and rapid weight loss following bariatric surgery are risk factors for developing gallstones and gallstone-related complications. Optimal perioperative management of bariatric surgical patients with asymptomatic gallstones remains controversial. We performed a systematic review to determine the safety of prophylactic cholecystectomy (PCC) concurrent with laparoscopic Roux-en-Y gastric bypass (LRYGB) or laparoscopic sleeve gastrectomy (LSG).

We searched EMBASE, MEDLINE, and Web of Science databases until June 2017. Exclusion criteria were open procedures, use of ursodeoxycholic acid, patients aged under 18 years, case reports/series, or articles unavailable in English.

We identified and screened 1787 articles, 10 of which met selection criteria: 8 were retrospective cohort studies (7994 patients) and 2 were case-control studies (216 patients). For LSG vs. LSG+PCC, operative time ranged between 95.3–95.7 and 128.2–157.2 minutes respectively. The only population-based study showed a significantly higher rate of post-operative pneumonia in the LSG+PCC group (0.9% vs. 0.3%;  $p=0.04$ ). Comparing LRYGB vs. LRYGB+PCC in the meta-analysis, there were no significant differences in operative time, bile duct injuries, wound complications, or hospital length of stay. However, in the latter group, open conversion and respiratory complications were significantly higher by 1.1% and 0.6% respectively. We noted considerable heterogeneity and variable quality (Newcastle-Ottawa scale) among the studies assessed.

PCC with LRYGB or LSG appears safe, but overall, there is insufficient high-quality evidence to guide management of asymptomatic gallstones at the time of bariatric surgery. Given the clinical equipoise, a well-designed clinical trial or population-level study with economic analysis may yield more definitive answers.

#### **A440**

##### **Revisional surgery after bariatric surgery: revision cause analysis and revisional procedure choices.**

Juzheng Peng *Guangzhou*<sup>1</sup>, Tsz Hong Chong *Guangzhou*<sup>1</sup>  
Jinan University<sup>1</sup>

**Objective** The objective of this study was to explore the cause and treatment of revisional Bariatric and metabolic surgery.

**Methods** A retrospective analysis was conducted on the clinical data of 36 patients who underwent revisional Bariatric surgery in the obesity and metabolic surgery department of the first affiliated hospital of the Jinan university from November 2000 to December 2018, and the reasons and surgical techniques of revision were analyzed.

**Results** Causes of reoperation include inadequate weight loss/weight regain 23 cases (63.9%), gastroesophageal reflux 6 cases (16.7%), recurrent diabetes 5 cases (13.9%), severe dumping syndrome 2 cases (5.6%). Primary surgical methods include Roux-en- Y gastric bypass 17 cases(47.2%), sleeve gastrectomy 9 cases (25%), gastric banding 8 cases (22.2%). A total of 36 patients underwent revision surgery, with a follow-up period of 4-118 months, 32 patients were followed up, and 4 patients were lost to follow-up (follow-up rate of 88.9%). Among the 32 patients who were followed up, 20 of them achieved satisfying results after surgery, and the symptoms and signs were relieved to various degrees. 11 of the patients fail to achieve the expected results, 1 patient died of renal failure and heart disease more than one year after the revision surgery.

**Conclusion** The most common cause of revisional metabolic and Bariatric surgery is inadequate weight loss/weight regain, Standardized primary surgery is especially critical for the prevention of revision.

#### A441

##### **Impact of Pre-bariatric Surgery Weight Loss on Post-bariatric Surgery Weight Loss and Can it Predict Post-surgical Weight Loss**

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Impact of pre-bariatric surgery weight loss has been shown to facilitate the surgical procedure in terms of reducing the liver mass allowing the surgeons to elevate the left liver lobe to expose the gastroesophageal junction easily for a Roux-en-Y Gastric bypass or to access the stomach easily for a sleeve gastrectomy. Pre-surgical weight loss is also beneficial in aiding the patients in improving the quality of their diet to accustom their eating habits post-surgery. However, the impact of pre-surgical weight loss on post-surgical weight loss in patients is not widely studied. Hence, we aim to study the impact of pre-bariatric surgery weight loss on post-surgery weight loss.

Pre-operative data and up to 3 years post-surgical data were obtained from bariatric patients between 2014 to 2016 and observed weight loss profiles were analyzed retrospectively.

The mean pre-surgical weight loss was 1.8kg. Patients who lost 1.8kg or more were deemed as



having significant weight loss. Patients who lost less than 1.8kg were seen as having insignificant weight loss. For the significant group and insignificant groups, mean percent weight loss before surgery was similar at -1.6% and -1.5% respectively, mean percent weight loss 1 year after surgery were -21.6% and -20.7% respectively while mean percent weight loss 3 years after surgery were -5.9% and -14.5% respectively.

Conclusion, pre-surgical weight loss does not impact greatly on post-surgical weight loss, on observation of individual data sets, the patients' lifestyle may have an even greater impact on their weight loss profiles in the long run.

**A442**

### **Frequencies, Types, Causes and Outcomes of Peripheral Neuropathies emerging after Bariatric Surgery at a Single Centre in Qatar**

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#### **Introduction**

After bariatric surgery (BS), neurological complications are sometimes observed, including peripheral neuropathy (1,2), attributed mainly to nutritional deficiencies (e.g. B12 deficiency) (3,4). This paper identifies frequencies, types, causes and outcomes of peripheral neuropathies after BS.

#### **Methods**

This single-center, retrospective, descriptive study was undertaken at Bariatric and Metabolic Center at Hamad Medical Corporation (HMC) in Doha, Qatar. We searched HMC databases and reviewed the charts of all patients who presented to HMC (January 2017-April 2019) with post BS peripheral neuropathies (N=17). Data extracted included findings of nerve conduction studies (NCS) (identify peripheral neuropathies), MRI spine (exclude anatomical causes), and nutritional assessment (e.g. zinc, copper, selenium, B12 levels). Full data were not available for five patients (hence excluded), leaving 12 patients. We also conducted phone interviews with patients to enquire about the recovery status.

#### **Results**

Baseline characteristics, nutritional deficiencies, and peripheral neuropathy by gender are shown in Tables 1-3. NCS revealed no abnormalities in 44.4% of patients. Most common peripheral neuropathies were mixed (44.4%) and sensory (11.1%). Zinc deficiency was found in 41.6% of patients followed by selenium (25%) and B12 (25%). After correction of underlying nutritional deficiency for an average of 6 months and intensive physiotherapy, 25% had full recovery, 41.6% partial recovery and 33.3% showed no recovery.

#### **Conclusion**

Among 12 cases of clinical polyneuropathy, mixed polyneuropathy was most common. Zinc, Selenium and B12 deficiencies were the most common nutritional deficiencies associated with peripheral neuropathy post BS. Nutritional assessments need to be monitored soon after BS and deficiencies corrected immediately.

**A443**

**Systematic review and meta-analysis of the impact of revisional bariatric surgery on obesity-related metabolic outcomes**

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**Background and objective**

Evidence demonstrating the influence of revisional bariatric surgery on outcomes lacking. This study aims to examine the impact of revisional bariatric surgery on obesity-related metabolic outcomes.

**Methods**

Systemic review and meta-analysis. Searches of Medline, Embase, The Cochrane Library from 2007 – 2018 of studies conducted in English without restrictions to publication status. All study types reporting on metabolic outcomes after revisional bariatric surgery were considered. The literature search identified 35 relevant studies. These were categorized based on the predominant revision surgery examined in each study. Subgroup analysis examined outcomes of remission and improvement of diabetes, hypertension, hyperlipidemia and obstructive sleep apnea. Revision surgeries include sleeve gastrectomy (SG), roux-en-y gastric bypass (RYGB), pouch revision, duodenal switch and mini-gastric bypass.

**Results**

In 218 of 257 patients in 26 studies, revisional RYGB showed a non-significant improvement of diabetes with a RR 0.91 [0.87, 0.96]. Similarly, in 123 of 182 patients in 21 studies, revisional RYGB showed a significant remission of DM with RR 0.73 [0.65,0.80]. Only SG was found to have a significant improvement in hypertension with a RR 0.90 [0.77, 0.98]. Other revisional procedures did not induce any significant improvement in metabolic outcomes.

**Conclusion**

Revisional bariatric surgery in the form of RYGB continues to induce diabetes improvement and remission. The impact on metabolic outcomes for other revisional procedures however is not so clear and further longitudinal studies are required.

**A444**

**Opioid Sparing Protocol Allows Minimal Narcotic Requirement in Patients Undergoing Laparoscopic Roux-en-Y Gastric Bypass**

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Good Samaritan Hospital, Trihealth<sup>1</sup> Good Samaritan Hospital, Trihealth<sup>2</sup>

**PURPOSE:** The purpose of this study is to determine the postoperative narcotic requirement in patients undergoing laparoscopic Roux-en-Y gastric bypass (LRYGB) utilizing a perioperative opioid sparing protocol.

**METHODS:** A retrospective chart review was conducted of adult bariatric surgery patients undergoing LRYGB at a single institution from July 2018 to February 2019. During this time, our institution implemented an opioid sparing protocol, integrating a multimodal pain control approach. The protocol includes preoperative administration of acetaminophen, celecoxib and gabapentin, intraoperative transversus abdominus plane block, intravenous lidocaine and ketamine, and postoperative scheduled non-narcotic medications (acetaminophen, ketorolac and gabapentin). Patients were identified using procedure code. Demographic variables included age, race, gender, preoperative body mass index (BMI), and comorbidities. The percentage of patients using narcotics in the hospital and up to 30 days postoperatively was reported. 30-day mortality and readmission rates were also reported.

**RESULTS:** A total of 139 patients (18.7% male, 82.0% Caucasian) were analyzed. Average age and preoperative BMI were 47.9 (+/-11.7) years and 51.0 kg/m<sup>2</sup> (+/-10.7), respectively. Preoperative comorbidities included: diabetes (39.6%), hypertension (51.8%) hyperlipidemia (23.0%), obstructive sleep apnea (37.4%), chronic obstructive pulmonary disease (0.7%), gastroesophageal reflux (43.9%), tobacco use (12.2%). Postoperatively, 52.5% of patients did not use any narcotic medication as an inpatient (after post-anesthesia care unit), and 41.7% of patients did not require a narcotic prescription after their hospital stay. The 30-day mortality and readmission rates were 0.0% and 4.3%, respectively.

**CONCLUSIONS:** Utilizing an opioid sparing protocol in patients undergoing LRYGB is safe and results in minimal narcotic use postoperatively.

#### A445

##### **Effect of bariatric surgery on serum enzyme status in patients with obesity**

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**Background** There is scarce data about change of serum enzyme level in patients after bariatric surgery.

**Objectives** To assess serum enzyme status in patients receiving Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG), and to identify related predictors. **Methods** Patients receiving RYGB and SG in our center from January 2013 to June 2017 were retrospectively reviewed. Anthropometric data and serum enzyme data were collected preoperatively, 6 and 12 months postoperatively.

**Results** 381 patients (152 RYGB, 229 SG) were included. Serum enzyme abnormalities were common in patients before surgery, with 50.7% for elevated alanine aminotransferase (ALT), 32.5% for elevated aspartate aminotransferase (AST), 36.7% for elevated  $\gamma$ -glutamyl transpeptidase ( $\gamma$ -GT), 17.6% for elevated creatine kinase (CK), 14.8% for elevated lactic dehydrogenase (LDH), 8.5% for elevated adenosine deaminase (ADA), 7.4% for elevated

hydroxybutyrate dehydrogenase (HBDH), and 11.5% for decreased superoxide dismutase (SD). After RYGB and SG, the prevalence of serum ALT, AST,  $\gamma$ -GT, LDH, HBDH abnormalities decreased. The levels of ALT, AST,  $\gamma$ -GT, ADA, cholinesterase (CHE), LDH, CK and HBDH reduced significantly; while amylase and SD levels increased. Age and hyperlipemia were independent predictors of ALT, AST and HBDH change 1 year postoperatively. Fatty liver could predict postoperative CHE, LDH and CK change. Surgical procedure was independently related with postoperative amylase and ALP change.

**Conclusion** Serum enzyme abnormalities are common in bariatric surgery candidates, with reduced prevalence of abnormalities postoperatively. RYGB and SG are related with reduced ALT, AST,  $\gamma$ -GT, ADA, CHE, LDH, CK and HBDH, as well as increased amylase and SD levels.

#### A446

##### **Medium-term outcomes of revisional procedures compared to matched primary procedures**

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São João Medical Center<sup>1</sup>

**Introduction:** Many patients require additional bariatric procedures after failed adjustable gastric band (AGB), usually Revisional Gastric Bypass (R-GB) or Revisional Sleeve Gastrectomy (R-SG).

**Objectives:** Comparison of weight loss outcomes and surgical complications 5 years after R-GB and R-SG, compared to matched primary procedures (P-GB and P-SG).

**Methods:** Between 2010 and 2017, 334 (14.9% of 2247) patients were submitted to revisional procedures. The 50 first consecutive R-GB after failed AGB were selected and a group of 50 patients submitted to P-GB were matched regarding age, gender and BMI. The same was done for the 50 first consecutive R-SG. Variables compared: demographics; pre-operative BMI and main comorbidities; duration of surgery; early and late surgical complications; duration of follow up; weight loss outcomes 5 years after surgery. Successful weight loss was defined by excess weight lost > 50%, total weight lost > 20% and BMI < 35 kg/m<sup>2</sup>.

**Results:** Mean follow-up 52.5±21.5 months; 184 (92%) patients had <sup>3</sup>20 months of follow-up. 126 (63%) patients had co-morbidities. Successful weight loss was reached in 62.2% patients after R-GB, 54,3% patients after R-SG, 85,1% patients after P-GB and 58,7% patients after P-SG, p=0.029. Post-operative complications were reported in 27 (13.5%) and 11 (5.5%) required reoperations (8 trocar hernias), without significant differences between procedures. Mortality and conversion were not observed.

**Conclusion:** Weight loss outcomes of revisional procedures are inferior. Nonetheless more than half of these patients achieved successful weight loss, a fair result in this set of patients. Complications are comparable among primary and revisional procedures.

#### A447

## **Nutritional status in Chinese patients undergoing bariatric surgery: Two-year follow-up**

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University<sup>2</sup>

**Background** Nutritional abnormality has been reported in bariatric surgery patients with different outcomes. But data for Chinese patients is scarce.

**Objectives** To evaluate nutritional status in Chinese patients undergoing Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG), and to analysis related predictors.

**Methods** Patients undergoing RYGB and SG in our center from January 2013 to March 2017 were followed at baseline and 6, 12 and 24 months postoperatively. Anthropometric data and nutritional data were retrospectively collected.

**Results** A total of 334 patients (138 RYGB, 196 SG) were included in this study. Before surgery, nutritional deficiency was found for vitamin D (80.2%), vitamin B1 (38.9%), vitamin B6 (27.8%), folate (26.6%), vitamin C (17.6%), albumin (13.2%), transferrin (11.4%), and phosphorus (10.8%). After surgery, hemoglobin, globin, vitamin B12, and ferritin levels decreased significantly in the RYGB and SG group patients. Postoperative nutritional deficiencies were still frequent, and similar between the two groups. Compared with preoperative data, the incidence of hemoglobin and vitamin B12 deficiencies increased significantly in the RYGB group. Preoperative nutritional deficiencies were independent predictors of postoperative deficiencies for folate, calcium, albumin, vitamin D, vitamin B1, vitamin B6, and vitamin C, respectively.

**Conclusion** Nutritional deficiencies are common in Chinese patients undergoing RYGB and SG. Focusing on preoperative nutritional status and designing related supplemental program should prevent postoperative deficiencies.

## **A448**

### **From Type E to Me: Personalized, Holistic Self-Care for Clinicians**

Laura Anderson *Buffalo NY*

University at Buffalo

The majority of integrated and behavioral health clinicians wear multiple hats, with many lacking time or energy for adequate self-care. Although Type E is ultimately a figure of speech (neither DSM- nor ICD-classified), many clinicians feel pressured to be Everything to Everyone. This is especially true for clinicians in caretaking roles outside of work. Unfortunately, when clinicians do not practice self-care, the consumers of services –patients, clients, trainees, and consultees – also suffer. Likewise, low clinician self-care elevates risk for burnout and career dissatisfaction. This session will be spirited and pragmatic-designed to invigorate and inspire clinicians to integrate intentional, mindful, and simple self-care, daily, across life settings. An overview of research in the field of clinician self-care and patient outcomes will open the session. Holistic self-care will be defined and reviewed, and attendees will complete a validated self-care assessment. Participants will learn about the importance of defining, scheduling,

documenting, incentivizing, and communicating about self-care across the settings of their lives. At work, for example, simple changes in one's immediate environment can cue and enhance self-care. Those changes may also facilitate enriched rapport and connectedness with patients, clients, and consumers of clinician services. The session will conclude with participant discussion about simple, enjoyable, or playful self-care practices in their lives. This dialogue is designed to enhance attendee motivation and energy around developing personalized self-care micro-practices. Participants will be encouraged to implement at least one new micro-practice to improve holistic self-care and, ultimately, their own well-being and career satisfaction.

#### **A449**

##### **Evaluating Commercial Insurance Policies for Metabolic/Bariatric Surgery Across the US**

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Johnson & Johnson Medical Devices<sup>1</sup> Ethicon<sup>2</sup> Obesity Action Coalition (OAC)<sup>3</sup>

##### **Background:**

Despite the evidence supporting the safety, clinical benefits and cost-effectiveness of metabolic/bariatric surgery (MBS), uptake of these procedures in eligible patients remains low. Studies have documented significant disparities between the general population with severe obesity and the subset that have access to and/or receive MBS. Insurance coverage policies may be one reason why medically eligible patients are unable to receive the MBS. The aim of this study was to evaluate commercial plan's MBS coverage and associated requirements in the US.

##### **Methods:**

Bariatric policies by commercial insurers for each specific state were analyzed for coverage and plan details. Policies when available were reviewed and assigned a restrictiveness rating based on the coverage requirements.

##### **Results:**

A total of 2,769 policies were reviewed covering 176,267,846 lives. The majority had no listed policy available or not specified (60%). For policies reporting positive coverage (40%), minimum requirements include requiring a physician-supervised or appraised pre-surgical weight-loss regimen (67%). When specified, 6% of plans required long-term BMI documentation and 15% required absence of weight gain during weight-loss regimen. Pre-surgery regimen needed to occur for 12 (23%) or 24 (22%) months prior to surgery. The average restrictiveness score rating was 3 (standard deviation 2.3, median 4, range 0 to 10).

##### **Conclusion:**

Varying policies and requirements maybe lead to patients who are medically eligible being unable to obtain MBS. Patient advocacy, increased transparency in insurance policies, and removal of unnecessary restrictions may increase the number of patients benefiting from MBS.

#### **A450**

## **Review of Publications using Data from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP)**

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Gundersen Medical Foundation<sup>1</sup> Gundersen Health System<sup>2</sup>

*Introduction:* The objective of this study was to identify all peer-reviewed publications using Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) data to evaluate journal preference, characteristics, and variability among reports.

*Methods:* A literature search for all publications using keywords “Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program” or “MBSAQIP” to find all publications that used data from a MBSAQIP 2015, 2016, or 2017 participant use file (PUF).

*Results:* The MBSAQIP PUF from 2015 included 168,903 cases from 742 centers, the 2016 PUF included 186,772 cases from 791 centers, and the 2017 PUF included 200,374 cases from 832 centers. The literature search resulted in 35 peer-reviewed papers published from 2017-2018 in 9 different journals; 43% were published in *Surgery for Obesity and Related Diseases*. Six first authors published multiple papers using MBSAQIP PUFs. Twenty-four papers used the 2015 PUF, three used the 2016 PUF, and eight used PUFs from multiple years. The sample sizes included ranged from 623 to 325,653 patients. Seven publications compared outcomes by procedure type or patient characteristics, 16 were descriptive studies of outcomes, eight evaluated surgical techniques, two focused on revisional surgery, two evaluated the impact of trainees, and one evaluated the use of imaging.

*Conclusions:* There has been a growing number of bariatric centers and cases each year from 2015 to 2018 included in MBSAQIP. MBSAQIP provides a rich clinical database for quality improvement. The publications based on MBSAQIP PUF include a wide range of sample size, methodology, and topics.

### **A451**

#### **A Step Closer to the Elimination of Opioids After Bariatric Surgery**

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Geisinger Medical Center<sup>1</sup> Geisinger Community Medical Center<sup>2</sup>

**Background:** Perioperative use of opioids has been associated with opioid dependency after bariatric surgery. We evaluated the impact of a non-opioid analgesic regimen and the addition of transversus abdominis plane (TAP) block on postoperative milligram morphine equivalent (MME) use in our primary bariatric surgery population.

**Setting:** Single center, tertiary referral, MBSQIP-accredited bariatric surgery center

**Methods:** A retrospective review of a prospectively maintained database was conducted. We examined bariatric patient cohorts before and after the addition of TAP block to a multi-modal analgesia protocol. Opioid use was measured as MME both in the hospital and post-discharge in

the post-implementation group. Patients on chronic narcotic therapy were excluded. Univariate and multivariate analyses were performed.

**Results:** There were 825 patients in the pre-implementation (Pre) and 794 patients in the post-implementation (Post) groups. Total narcotic use declined from 44 MMEs to 30 MMEs ( $p < 0.0001$ ) in the Post group. Use of pre-operative non-opioids was associated with a 24 MME reduction in total narcotic use ( $p < 0.0001$ ). Patients undergoing sleeve gastrectomy used an average of 10MME less narcotics post-operatively ( $p=0.008$ ) than RYGB. There was a 10% reduction in the number of patients discharged home with narcotics. 40% of patients reported no pain at any point after discharge at first post-operative visit. The median outpatient MME use was 7.5.

**Conclusions:** Compliance with a non-opioid perioperative pain protocol combined with TAP block significantly reduced post-operative inpatient and outpatient opioid use. Outpatient pain scores were low, and most patients used less than two 5mg Oxycodone tablets.

#### A452

##### **Differential Unfolded Protein Response expression in skeletal muscle from patients with obesity with normal or impaired glucose tolerance before and after bariatric surgery**

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Background: Not all people with obesity become glucose intolerant, suggesting differential activation of cellular pathways. The Unfolded Protein Response (UPR) may contribute to the development of insulin resistance in several organs but its role in skeletal muscle remains debated. Here, we explored the UPR in glucose tolerant or intolerant individuals with obesity and investigated whether bariatric procedures impact UPR signaling.

Methods: Nondiabetic patients (Body Mass Index > 35) were divided based on their glucose tolerance status (blood glucose measured 120 min after an oral glucose tolerance test, G120): 22 were normoglycemic (NG, blood glucose < 7.7 mM), 22 were glucose intolerant (GI, blood glucose between 7.7 and 11 mM). UPR-related gene and protein expressions were measured in abdominal muscle biopsies. Seven NG and seven GI patients were selected to study the UPR in muscle biopsies obtained before and after bariatric procedures.

Results: BIP protein increased by ~40% in GI compared to NG patients. Contrastingly, UPR-related gene expression such as BIP, ATF6 and unspliced XBP1 were significantly lower in GI patients. CHOP tended to decrease ( $p=0.08$ ). While BIP protein positively correlated with fasting blood glucose ( $r=0.38$ ,  $p=0.01$ ), ATF6 and CHOP were connected with G120 ( $-0.38$  and  $-0.41$ ,  $p < 0.05$ ) and Matsuda index ( $r=0.37$  and  $r=0.38$ ,  $p < 0.05$ ). Improvement of metabolic parameters after bariatric surgery was associated with increased CHOP expression while ATF6 tended to increase in GI patients.



Conclusion: UPR expression is differentially expressed between NG and GI patients and modified by bariatric surgery. UPR may contribute to glucose homeostasis alterations in human skeletal muscle.

#### A453

##### **Personalized, Multi-Component Interventions for Behavioral Weight Management: Yes, but How? A Hybrid Intervention of Compulsory and Personalized Elements Based in Self-Determination Theory**

Laura Anderson *Buffalo NY*  
University at Buffalo

Bariatric surgery is the most effective treatment for severe obesity. However, with more than 40% of postoperative bariatric patients experiencing excessive weight regain (i.e., 25%+ of total lost weight) and the *majority* of patients regaining some weight, there is a need for individualized behavioral interventions to promote sustained, lifelong maintenance of surgical weight loss. Given the multifactorial nature of weight regain, interventions must be multicomponent and personalized. This recommendation represents best practice; however, clinicians may lack knowledge or experience for pragmatic implementation. This session will address these issues, highlighting self-determination theory (SDT) as optimal for conceptualizing personalized treatments. Emphasis will be placed on the utility of the three components of SDT – autonomy, competence, and relatedness – to inform personalized, holistic interventions for patients who have lost or are trying to lose weight. SDT-based, personalized behavioral interventions can be tailored for both surgical and non-surgical populations with obesity, and they are ideal for preventing recidivism following weight loss. A brief overview of the BOSS intervention (Bariatric Outcomes: Sustaining Success) will be provided: this is an SDT-based, multicomponent intervention for promoting sustained weight loss and preventing recidivism. Five adult case examples will highlight how the intervention is tailored across SDT domains of autonomy, competence, and relatedness. Preliminary outcome data will also be provided: all patients are actively losing weight or maintaining weight loss. The session will demonstrate the implementation and personalization of evidence-based interventions, emphasizing the need for both compulsory and individualized elements within a multi-component program for lifelong behavioral weight management.

#### A454

##### **Safety and effectiveness of single-stage conversion of adjustable gastric band to laparoscopic sleeve gastrectomy**

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Brigham and Women's Hospital<sup>1</sup>

**Background:** The laparoscopic adjustable gastric band (AGB) is associated with poor long-term weight loss and frequent untoward outcomes. Increasingly, patients are referred for revisional bariatric surgery, wherein a previously-placed adjustable gastric band is removed in favor of laparoscopic Roux-en-Y gastric bypass or sleeve gastrectomy (SG). Recently, data have emerged that argue for the safety of a 1-stage approach to these maneuvers, which offers potential benefits over a 2-stage approach including fewer instances of general anesthesia, fewer total abdominal procedures, and fewer interruptions in patients' lives.

**Methods:** We performed a retrospective review of 229 patients who underwent elective, laparoscopic conversions of previously-placed AGBs to SG from 2010 through 2018. We captured standard demographic variables including age, gender, pre-conversion weight, BMI, and medical co-morbidities. We captured operative duration, use of a gastric bougie, staple line reinforcement, provocative testing, and postoperative swallow studies. We tracked length of stay (LOS), 30-day readmissions, emergency room visits, and complications. We tracked weight loss at 12 months from surgery.

**Results:** Median postoperative LOS was 2 days. Two patients (0.8%) developed SSI. One patient (0.4%) developed unplanned reintubation, MI, and ICU admission. There were 8 total emergency room visits (3.5%), 3 outpatient visits for IV hydration (1.3%), 4 total readmissions (1.7%), and 1 reoperation for staple line leak (0.4%). Mean decrease in BMI was 13.45% at 12 months.

**Conclusion:** Single-stage conversion of AGB to SG is both safe and effective and promoting weight loss at 1 year. Our findings compare favorably with those of other groups.

## A455

### **Aerosolized fibrin sealant does not reduce risk of staple line bleeding following laparoscopic sleeve gastrectomy**

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Anne Arundel Medical Center<sup>1</sup>

#### **Background**

Staple line bleeding is a potential postoperative complication encountered following sleeve gastrectomy. Fibrin sealant is designed to mimic the terminal coagulation cascade to provide stable clot formation and minimize postoperative blood loss. The following investigates the effect of aerosolized fibrin sealant on post-operative bleeding rates in patients undergoing non-revisional laparoscopic sleeve gastrectomy (LSG).

#### **Methods**

Patients were prospectively consented for LSG at a high-volume bariatric surgery center. Patient records were reviewed by aerosolized fibrin sealant (FS) or no fibrin (NF) status. Demographic and perioperative information were collected for statistical analysis including PACU and postoperative hemoglobin levels with  $p < .05$  determined as significant.

## Results

A total of 84 patients were studied, of which 46 (54.8%) received conventional LSG and 38 (45.2%) received LSG with aerosolized fibrin sealant. No significant differences were observed between cohorts by demographics including average age, BMI, and gender distribution. Groups demonstrated similar average PACU hemoglobin (FS 12.8 g/dL, NF 12.8 g/dL) and hemoglobin on postoperative day one (FS 12.4 g/dL, NF 12.3 g/dL). Postoperative peak systolic blood pressure, rates of blood transfusion, and frequency of concurrent hiatal hernia repair were not statistically different. Similar rates of anticoagulation use, toradol use, and frequency of postoperative nausea, was appreciated by both groups.

## Conclusions

While a useful tool for control of intraoperatively identified bleeding, our findings suggest aerosolized fibrin sealant does not convey added benefit for minimizing postoperative blood loss following laparoscopic sleeve gastrectomy. These data are consistent with previously published reports on the utility of fibrin-based adhesives in hemostasis.

## A456

### The Efficacy Of Intra gastric Balloon Versus Botulinum Toxin Injection In Obese Patients

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**Background:** Bariatric surgery is currently the most effective procedure. Also, endoscopic treatment of obesity such as intra gastric balloon and botulinum toxin (BT) injection is an option for obesity. The aim of study is to compare the efficacy of treatment between IGB or BT injection.

**Methods:** Between January 2018 and January 2019, 52 patients, aged between 21-52 years, were included in the study. In 26 patients (first group), 450-650 cc non-adjustable intra gastric balloon placement was performed, while 100 unit of BT was injected for the remaining 26 patients (second group). For the both group were followed by the dietitian to gain a healthy eating habit for the 1<sup>st</sup> week, 1<sup>st</sup> month and 3<sup>rd</sup> month.

**Results:** In the first group, there was a very low (.00-.24) negative correlation in the first week while the second group, the variables were highly positive correlated (.90-1.00) in the first week. In the 1<sup>st</sup> and 3<sup>rd</sup> months, the first group had a weak (.26-.49) negative correlation and the second group had a very high positive correlation (.90-1.00). In the first group, there was a significant difference ( $p < .05$ ). When it was considered the meaningful differences between the groups, the initial weight of first group was found to be in the 1<sup>st</sup> week (.03  $< .05$ ), in the 1<sup>st</sup> month (.00  $< .05$ ) and in the 3<sup>rd</sup> month (.00  $< .05$ ).

**Conclusion:** IGB and BT injection methods are used to treat patients who are not successful only by lifestyle change method. According to our experience, intra gastric balloon is more efficient treatment than botulinum toxin injection .

**A457**

**Laparoscopic TAP Block during Sleeve Gastrectomy: Effect on Postoperative Pain and Patient Controlled Analgesia Utilization – A Pilot Study.**

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**Introduction:**

Obtaining optimal pain control in the postoperative period is an integral part of patient care. Narcotics are commonly used as the mainstay of acute post-surgical pain management. TAP blocks have been utilized in several surgical settings with good results. In an effort to minimize narcotic use, utilizing a transversus abdominis plane (TAP) block could serve as a potential adjunct.

**Methodology:**

Twenty consecutive patients who underwent Laparoscopic Sleeve Gastrectomy were assigned to each arm of the study. Bupivacaine was used as the anesthetic agent for the control group receiving the TAP block and this was compared to the control group who had received Bupivacaine as an infiltrating block around the trocar incisions. We looked at various parameters during their admission, including pain, nausea, time to ambulation, time to discharge and medication use.

**Result:**

Our population was comparable. The Pain Score and Patient Controlled Analgesia use even though statistically insignificant was less at 2 hours postoperatively. At 6 hours post-surgery the PCA use was significantly low 7.46 v 4.63 (p <0.05). Length of stay reduced by 162 minutes. After 6 hours the pain score and PCA use was higher

**Conclusion:**

In our pilot study after initiation of using Bupivacaine as a TAP block instead of a field block around the trocar. This showed a short lasting early post-operative advantage in controlling pain and narcotics use.

**A458**

**Are we recommending appropriate levels of supplementation for duodenal switch patients?**

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Introduction. There is a large group of self-taught “Duodenal Switch Veterans” (those who had DS surgery many years ago) who believe that supplementation should be much more aggressive than the ASMBS guidelines suggest.

Methods. We sent surveys to six of the largest duodenal switch Facebook groups with a total number of followers of 6.5K. We analyzed 52 years’ worth of data points with strictly defined inclusion criteria.

Results. For Vitamin A, patients had normal laboratory values at 90.4% of lab draws (N =89), 9.6% - above normal. They were taking a mean of 36,730IU Vitamin A daily. For Vitamin D, patient had normal laboratory values at 86.4% of lab draws (N=89), 1.7% - above normal, 11.9% - below normal. They were taking a mean of 82,619IU Vitamin D daily. For Vitamin E, patients had normal laboratory values at 100% of lab draws (N=89) and were taking a mean of 266mg Vitamin E daily. For Vitamin K, patients had normal laboratory values at 80% of lab draws (N=81) and were below normal the remaining 20 %. They were taking a mean of 1,209mg Vitamin K daily. Majority of our patients, 88.5%, were taking vitamins 3-6 times per day.

Conclusion. The patients in our study were taking much larger quantities of daily supplementation than is currently recommended by ASMBS, and they were able to maintain normal laboratory values for most key vitamins.

#### **A459**

#### **Preoperative weight loss is associated with shorter operative time and hospital stay and decreased rates of readmission without increase in adverse effects**

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University of Miami<sup>1</sup>

#### Background:

Despite a high BMI, micronutrient and protein malnutrition are known to coexist creating the obesity paradox. Recent studies have shown increased adverse outcomes compared to BMI matched patients. We investigated the effect of the reduction of BMI on perioperative outcomes and mortality.

#### Methods:

MBSAQIP 2016 was used as the data source. Patients who underwent laparoscopic sleeve gastrectomy(LSG) and gastric bypass(LGBP) were included. BMI change was calculated by subtracting the closest BMI recorded to patient’s surgery date from the patient’s highest BMI. The effect of BMI change on operative length and hospital stay were analyzed by linear regression models. The effect of 30-day mortality, leak, ICU admission, renal failure, sepsis, PE, and ventilator>48hrs were analyzed by binary logistic recession models to correct for confounders.

#### Results:

147,141 patients were identified. 79.5% were female, mean age was 44.6 years. 73.2% (107,726) underwent LSG and 26.8% (39,425) underwent LGBP. The effect of BMI reduction after

correcting for confounding factors on 30-day mortality ( $p=0.215$ ), ICU admission ( $p=0.120$ ), leak ( $p=0.421$ ), PE ( $p=0.581$ ), pneumonia ( $p=0.322$ ), ventilator $>48$ hrs ( $p=0.672$ ), sepsis ( $p=0.171$ ) were not significant. However, readmission rate (OR 0.952, 95% CI 0.891-0.995,  $p=0.041$ ) was lower and operative length (slope coefficient  $-0.178$ ,  $p<0.001$ ) and hospital stay slope coefficient  $-0.103$ ,  $p<0.001$ ) were significantly shorter.

#### Conclusion:

No differences in complication rates were found with preoperative weight loss in this study even though hospital stay and operative time were shorter and readmission rates was lower. Preoperative weight loss should be encouraged in patients undergoing bariatric surgery

## A460

### The Effect of First Assist Training Level on Bariatric Surgery Outcomes

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University of Miami<sup>1</sup>

#### Background:

The effect of surgeon training and volume on bariatric surgery outcomes is well established, however the impact of trainees and other surgeons as first assistants (FA) on outcomes is an area of discussion. We sought to identify the effect of FA level on perioperative outcomes and 30-day mortality.

#### Methods:

MBSAQIP 2016 was the data source. Patients who underwent laparoscopic sleeve gastrectomy(LSG) and laparoscopic gastric-bypass(LGBP) were included. Logistic regression models were created to identify the effect of FA training level and the factors affecting the perioperative outcomes (ICU admission, readmission, reoperation, leak, coma, sepsis, ventilator $>48$  hours, renal failure, PE) and mortality. Linear regression was used to analyze the effect on operative length.

#### Results:

147,151 patients were identified. 79.5% were female, mean age of 48.1 years. 73.2% (107,726) underwent LSG. Mean operative time was 85 minutes. Compared to a bariatric surgeon, a significant regression equation was found in FA (slope coefficient  $-0.150$ ,  $p=0.045$ ) between others, while no difference was seen between fellows, residents, and CSA's( $p=0.218$ ). 30-day mortality rate was 0.1% (124) but the FA training level was not a significant factor ( $p=0.771$ ). Overall complication rate was 2.2% (3,237 patients). After correcting for confounders, fellows-residents as FA did not have an effect on leak, readmission, reoperation, and ICU admission. However, bariatric surgeon as FA significantly decreased the odds of a leak(OR 0.85, 95% CI 0.67-0.96  $p=0.009$ ) and overall complications(OR 0.82  $p=0.045$ ).

#### Conclusion:

Trainees as FA does not increase mortality, reoperation rates, or readmission rates after bariatric surgery.

## A461

### **Conversions to open surgery greatly increase complications: an analysis of the MBSAQIP database**

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Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Background:** The Metabolic and Bariatric Surgery Accreditation Quality Initiative Program (MBSAQIP) database tracks patients, techniques and outcomes for 30 days. The overwhelming majority of cases reported are performed using a laparoscopic technique. Bariatric surgeons rarely have to convert from laparoscopy to open surgery.

We examined the MBSAQIP to determine the characteristics of patients who underwent conversion and short term outcomes.

**Methods:** The MBSAQIP Public Use File for 2017 was examined for primary bariatric operations. We identified patients who underwent a sleeve gastrectomy or gastric bypass using a minimally invasive technique. We identified patients who underwent conversion to another operative technique or were converted to open surgery and examined preoperative characteristics and postoperative complication rates. Relative risks (RR) were calculated for complications. P was significant at < 0.05.

**Results:** There were 186,962 patients in the entire cohort. 609 patients underwent conversion from the original surgical technique to either open surgery (n=457) or to another approach (n=152). Patients undergoing conversion to open had longer operative times (191 vs 86.6 minutes [P<0.00]), longer time to discharge (6.2 vs 1.6 days [P<0.001]), and had higher rates of oxygen dependency, poor functional status, previous foregut/obesity surgery, preoperative renal insufficiency and were anticoagulated. The RR of death was 18.2 (95%CI 8.7-37.6, P<0.001) for procedures converted to open. RR of sepsis was 10.1 (95%CI 4.2-24.2, P<0.001) and RR for all complications was increased throughout.

**Conclusions:** Patients in the MBSAQIP database that undergo conversion to the open surgical approach are at greatly increased risk for death and complications.

## A462

### **Opioid Sparing Protocol Allows Minimal Narcotic Requirement in Patients Undergoing Laparoscopic Sleeve Gastrectomy**

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**PURPOSE:** The purpose of the study is to determine the postoperative narcotic requirement in patients undergoing laparoscopic sleeve gastrectomy (LSG) utilizing a perioperative opioid sparing protocol.

**METHODS:** A retrospective chart review was conducted of adult bariatric surgery patients undergoing LSG at a single institution from July 2018 to February 2019. During this time, our institution implemented an opioid sparing protocol, integrating a multimodal pain control approach. The protocol includes preoperative administration of acetaminophen, celecoxib and gabapentin, intraoperative transversus abdominus plane block, intravenous lidocaine and ketamine, and postoperative scheduled non-narcotic medications (acetaminophen, ketorolac and gabapentin). Patients were identified using procedure code. Demographic variables included age, race, gender, preoperative body mass index (BMI), and comorbidities. The percentage of patients using narcotics in the hospital and up to 30 days postoperatively was reported. The 30-day mortality and readmissions were also reported.

**RESULTS:** A total of 68 patients (7.4% male, 69.1% Caucasian) were analyzed. Average age and preoperative BMI were 45.1 (+/-11.6) years and 49.9 (+/-10.9) kg/m<sup>2</sup>, respectively. Preoperative comorbidities included: diabetes (23.5%), hypertension (54.4%) hyperlipidemia (14.7%), previous myocardial infarction (1.5%), obstructive sleep apnea (25.0%), gastroesophageal reflux (30.9%), tobacco use (7.4%). Postoperatively, 57.4% of patients did not use any narcotic medication as an inpatient (after post-anesthesia care unit), and 54.4% of patients did not require a narcotic prescription after their hospital stay. The 30-day mortality and readmission rates were 0.0% and 5.9%, respectively.

**CONCLUSIONS:** Utilizing an opioid sparing protocol in patients undergoing LSG is safe and results in minimal narcotic use postoperatively.

#### A463

##### **Anatomy-based sleeve gastrectomy superior to sleeve gastrectomy with bougie in a retrospective cohort analysis**

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Bariatric Medicine Institute<sup>1</sup> University of Cincinnati<sup>2</sup> Qualitee 360<sup>3</sup> State University of New York at Buffalo<sup>4</sup> Baylor college of medicine<sup>5</sup>

**Background** Sleeve gastrectomy pouch imperfections have been implicated in postoperative gastroesophageal reflux disease (GERD) and other complications. Anatomy-based sleeve gastrectomy (ABS) has been developed to improve the shape, volume and anatomic consistency of the laparoscopic sleeve gastrectomy (LSG) pouch. In ABS, a pouch is created by applying a



clamp 1-cm from the gastroesophageal junction, 3-cm from the incisura, 6-cm from the pylorus and stapling adjacent to the clamp.

**Methods** Retrospective cohort analysis of MBSAQIP data from a single academic institution in the United States. LSG was performed in 1556 patients using either bougie (744 patients) or ABS (812 patients) technique. Comparisons were made with Students t- test and Chi square tests as appropriate.

**Results** In the ABS group compared to the bougie group, operative time (103.3 vs 111.9 minutes,  $p < 0.01$ ) and length of stay (1.2 vs 1.6 days,  $p < 0.01$ ) were significantly shorter. GERD rates and GERD resolution rates were superior in the ABS group at 6 and 12 months (Table 1). At 12-months, there was no significant difference in percentage total weight loss between groups (20.7 vs 22.2%,  $p = 0.08$ ). There was no significant difference in rates of reoperation, bleeding, leak, or readmission between groups.

**Conclusion** In a single center experience of 1556 patients, ABS is superior to sleeve gastrectomy with bougie with regard to operative time, length of stay, GERD at 6 months, and GERD at 1 year.

#### A464

##### **Diabetes Remission Rates after Sleeve Gastrectomy and Roux-en-Y Gastric Bypass: An Individualized Metabolic Surgery Score for Koreans**

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LHK Bariatric and Metabolic Clinic<sup>1</sup>

**Background:** The appropriate selection of patients and surgical procedures is essential for better outcomes after metabolic surgery in patients with type 2 diabetes mellitus (T2DM) and morbid obesity. We validated the usefulness of an individualized metabolic surgery (IMS) score to guide procedure selection based on the severity of T2DM in Koreans.

**Methods:** This study analyzed 135 patients with T2DM (age  $40 \pm 11$  years, 76% female, body mass index (BMI)  $39.0 \pm 6.3$  kg/m<sup>2</sup>) who underwent sleeve gastrectomy (SG; n=19) or Roux-en-Y gastric bypass (RYGB; n=116). The mean duration of T2DM was  $3.3 \pm 0.4$  years and the mean HbA1c was  $8.0 \pm 0.1\%$ .

**Results:** At the 1-year follow-up, the mean BMI decreased to  $28.6 \pm 4.6$  kg/m<sup>2</sup> and the mean percent total weight loss was  $26.4 \pm 7.7\%$ . The mean HbA1c decreased to  $6.0 \pm 1.1\%$  and T2DM remission (HbA1C < 6.5%, off medication) was achieved in 88 (65.2%) patients. In patients with mild T2DM (IMS score  $\leq 25$ ), the diabetes remission rate did not differ significantly ( $P > 0.99$ ) between the RYGB (88%) and SG (90%) groups. However, the remission rate was higher after RYGB in the moderate severity group (IMS score 25–95), although the difference was not significant (RYGB 70% vs. SG 38%,  $P = 0.11$ ). In patients with severe T2DM (IMS score > 95), the remission rate was low in both surgical groups (RYGB 6% vs. SG 0%,  $P > 0.99$ ).

**Conclusion:** This study validated the ability of the IMS score to predict the remission of diabetes and recommends surgical procedures in Koreans with T2DM and morbid obesity.

#### **A465**

### **Usefulness of V-shaped liver retraction in sleeve gastrectomy for patients with morbid obesity**

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The Catholic university of Korea

**Purpose:** Liver retraction is very important to secure the visual field around the stomach in obesity surgery. We introduced not only more simple but also less invasive and harmful technique to lift the liver during sleeve gastrectomy.

**Materials and Methods:** During sleeve gastrectomy, the liver was lifted in a V-shape using a polypropylene monofilament, a straight taper needle, and two plastic surgical clips. The pars flaccida of the hepatogastric ligament was divided, and two plastic surgical clips were used to fix the polypropylene to the pars condensa. The polypropylene was extracted using attached straight taper needle and tied up at the epigastrium without any instrument.

**Results:** V-shaped liver retraction was performed in 20 patients with morbid obesity who underwent sleeve gastrectomy between January and April 2019. Mean body mass index was 41.2 and mean operation time was 128.2 min. In all 20 operations, there was no additional procedure or trocar insertion to lift the liver. and postoperative AST/ALT were 62.9/88.5 U/L. Mean duration to discharge was 3.1 day and postoperative morbidity was not occurred.

**Conclusion:** V-shaped liver retraction is safe, practical and less invasive method in sleeve gastrectomy for patients with morbid obesity.

#### **A466**

### **Sleeve Gastrectomy in a Patient with Prader Willi Syndrome**

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Ponce health sciences university<sup>1</sup>

**Background:** Prader Willi Syndrome (PWS) is a genetic disorder that results from paternal imprinting in chromosome 15 and represents the most common genetic cause of life-threatening obesity in childhood and adolescence.

**Case report:** We report the case of a 26-year-old man with PWS and morbid obesity (BMI 65kg/m<sup>2</sup>) since childhood. He also suffered from uncontrolled diabetes mellitus type 2, hypertension, and obstructive sleep apnea. After an unsuccessful diet and exercise program, he opted for bariatric surgery in which laparoscopic sleeve gastrectomy was performed.

**Results:** Within the first 3 months after surgery, the patient's BMI decreased from 65 to 50 kg/m<sup>2</sup>. Furthermore, the patient was deescalated from U-500 insulin and oral hypoglycemic regimen to solely oral hypoglycemic therapy. Lastly, at the 9 months follow up, the patient's antihypertensive medications were no longer necessary. **Conclusion:** Laparoscopic sleeve

gastrectomy (LSG) has proven to be effective in the short term outcomes of patients with PWS. Further, follow up will be required to assess long term outcomes.

#### **A467**

##### **The Standard Clamp: A novel tool for the standardization of the laparoscopic sleeve gastrectomy**

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University of Cincinnati<sup>1</sup>

##### **Introduction:**

Laparoscopic sleeve gastrectomy (LSG), although a relatively simple procedure, often results in resultant sleeve pouch size and shape variability. Standard Clamp (SC), a hand-held stapling guide, has previously shown to result in fewer staple cartridges wasted. In this study, we aimed to demonstrate SC efficacy through fluoroscopic appearance of the resultant sleeve and patient outcomes.

##### **Methods:**

A prospective, single-center, single-surgeon, randomized controlled study was conducted to compare LSG with SC (n=21) to routine LSG without SC (n=18). Upper gastrointestinal fluoroscopy was performed post-operatively and read by four independent radiologists to measure specific sleeve parameters (upper, mid-sleeve, lower sleeve diameter) and classify pouch appearance (tubular, upper pouch, lower pouch, dumbbell). Subjects underwent 2-month and 12-month follow-up to evaluate for weight loss and LSG-related adverse events.

##### **Results:**

There were no differences in baseline demographics or comorbidities. There were no significant differences ( $p>0.05$ ) in upper sleeve (2.7 vs 2cm), mid-sleeve (2 vs 1.5cm), lower sleeve (2 vs 2.5cm) diameter as well as sleeves achieving the ideal tubular shape (61.1 vs. 64.7%). Percent total body weight loss at 2-months (-12.2 vs -14.9kg) and 12-month (-22 vs. -25.4kg) were equivalent ( $p>0.05$ ). There was no difference in adverse events at 2-month follow-up (9.5 vs. 11.1%,  $p>0.05$ ) nor additional adverse events between 2-month and 12-month follow-up.

##### **Conclusion:**

The addition of the SC to LSG resulted in equivalent resultant sleeve parameters without adversely impacting short and long-term patient outcomes. Future studies should be conducted to evaluate SC use for standardization of surgical technique across multiple surgeons.

#### **A468**

##### **Intussusception after Roux-en-Y gastric bypass**

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Medical College of Georgia at Augusta University<sup>1</sup>

Roux-en-Y gastric bypass (RYGB) is increasingly performed due to its effectiveness for weight loss and improvements of medical comorbidities. Common complications of RYGB include anastomotic leaks and strictures, marginal ulcers, small bowel obstructions, and internal hernias. A rare complication after RYGB is intussusception, which has a prevalence between 0.07% and 0.6%. Intussusception typically occurs in a retrograde fashion at the jejunojejunostomy and can present with nonspecific or obstructive symptoms. The underlying pathophysiology of intussusception is thought to be secondary to disrupted intestinal motility associated with the Roux-en-Y anatomy. Prompt diagnosis and treatment is necessary to prevent bowel necrosis; mortality rate can be up to 50% if treatment is delayed 48 hours after onset of symptoms. Intussusception can be treated with resection and revision of the jejunojejunostomy, or manual reduction with or without enteropexy.

Here, we present an updated literature review of reported cases of intussusception after Roux-en-Y gastric bypass from 1991 to 2018, including demographics, common presenting symptoms, timing of presentation after surgery, diagnosis, treatment modalities, and recurrence rates.

#### **A469**

#### **Safety of one anastomosis gastric bypass (OAGB): Experience in a bariatric surgery reference center in Mexico City**

Juan Carlos Verdugo *Ciudad de Mexico*<sup>1</sup>, Fernando Gonzalez<sup>1</sup>, Juan Arreola<sup>1</sup>, Yunerhi Pichon<sup>1</sup>, Juan Melgarejo<sup>2</sup>, Nestor Apaez *México City México city*<sup>2</sup>, Israel Gonzalez *Mexico*<sup>2</sup>, Francisco Campos<sup>3</sup>, Raul Marin<sup>2</sup>

Hospital General Dr. Ruben Leñero<sup>1</sup> Hospital Dr. Ruben Leñero<sup>2</sup> Hospitla Dr Ruben Leñero<sup>3</sup>

#### **Background**

The OAGB is a frequently done procedure, representing the 7.6% of the total bariatric procedures in the world. Literature suggests that this is an easier procedure with lower rate of complications and excellent results. Even though it has promising results, patients can develop serious complications, than can require revisional surgery.

#### **Objective**

Describe the early and late complications in a bariatric surgery reference center in Mexico City

#### **Methods**

A descriptive retrospective study, in which 238 patients were included with OAGB from september 2014 to february 2019. The variables included were the early and late complications with the Clavien Dindo classification system.

#### **Results**

From the 238 patients only 213 had a complete follow up. The frequency of early complications was of 3.7% (8 of 213 patients), 6 of this complications were between III and V of Clavien Dindo. The percentage of late complications was 35% (75 of 213 patients). From the last one 26 were between III and V of Clavien Dindo classification. The number of severe adverse events that required revisional surgery was of 18 patients (8.4%), requiring conversion to Roux in Y gastric bypass. The mortality rate was 0.9%.

#### **Conclusions**

The OAGB is an effective surgical treatment for obesity and related diseases, for its long term

results, equal or better than traditional procedures. Although it has good long term results, it's important to mention the adverse events that can present from this procedure, some can be severe, such as malnutrition and gastroesophageal reflux.

#### **A470**

##### **Reflux disease after Sleevegastrectomy – a quality of life assessment**

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UNIV CLINIC HAMBURG EPPENDORF<sup>1</sup>

#### **BACKGROUND**

Morbidly obese patients are affected by gastroesophageal reflux disease (GERD) more frequently than lean patients. Because of conflicting results, the indication to sleeve gastrectomy (SG) in patients with GERD is still debated. Aim of the study was to evaluate the de novo incidence of GERD and the resulting quality of life in patients undergoing sleeve gastrectomy.

#### **METHODS:**

From August 2013 to February 2016 an analysis of 130 patients undergoing SG was performed. Patients characteristics, GERD-HRQL, proton pump inhibitors (PPIs) consumption, and results oesophagogastroduodenoscopy (EGD) pre- and postoperative were collected.

#### **RESULTS:**

All patients (n=130) accepted to take part in the study (median BMI 53.0 ±9,7 kg/m<sup>2</sup>). 45 patients routinely took PPI before operation (34,6%), while 35 patients had reflux esophagitis in preoperative endoscopy (26,9%). A total of 31 patient took PPIs (23,8 %). In the GERD HRQL a mean score of 7,6 was reached preoperatively, while 46 patients (35,4%) felt unsatisfied with actual reflux symptoms. At a median 15 months of follow-up, incidence of GERD seems to decrease compared with preoperative values. Postoperatively mean GERD HRQL score decreased to 4,3 in the same cohort, while only 12 patients (9,2%) felt unsatisfied. Nevertheless, 70 patients took routinely PPIs (53,8%) after sleevegastrectomy.

**CONCLUSION:** In the present series the incidence of GERD in SG patients was lower than reported in the current literature. On the other hand PPI treatment was significantly more common after SG, leading to better GERD treatment. Thus, life quality measured by GERD HRQL was significantly improved after SG.

#### **A471**

##### **Early Gastric Sleeve Leak Treated with Endoprosthesis: A Case Report and Review of Literature**

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NYU Langone Hospital<sup>1</sup> Vassar Brothers Medical Center<sup>2</sup>

A 50 year old female with recent sleeve gastrectomy presented with 24-hours of severe abdominal pain. Her vital signs and labs were grossly normal; however CT demonstrated

inflammatory changes to her stomach and abdomen likely secondary to perforation. The patient underwent emergent diagnostic laparoscopy where the staple line was examined with no obvious leak, gastric fistula, or abscess. An endoscopic provocative air leak test was performed with no evidence of leak. Due to high clinical suspicion, an upper GI series was obtained and demonstrated focal contrast leak from the gastric cardia. The patient underwent repeat endoscopy where a dimple with surrounding granulation tissue was noted on the proximal end of the sleeve, distal to the gastroesophageal junction. An OverStitch device was used to approximate the tissue followed by deployment of a 23mm x 15.5cm WallFlex endoprosthesis. A repeat upper GI study was negative and the remainder of her hospital course was uncomplicated.

Sleeve gastrectomy is associated with three significant complications: staple line bleeding, leak, and stricture. Staple line leaks are among the most concerning with significant morbidity and mortality if left untreated. There remains an absence of an internationally adopted algorithm for the management of leaks. Once diagnosed, treatment of a leak often depends on the clinical status of the patient and may range from surgical intervention in an unstable patient, to endoscopic exclusion techniques, and conservative management. This case report also emphasizes the importance of utilizing an upper GI series to more accurately characterize a leak.

#### A472

### **Implementing an EMR-based Registry to improve Retention and transition after Bariatric Surgery Among Adolescents and Young Adults**

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**Background:** Guidelines for providing care during the transition from pediatric to adult health care emphasize the importance of regular follow-up for adolescents and young adults (AYA) with chronic health needs. In bariatric programs, retention rates are low. This is a significant problem among AYA who are at increased risk for nutrient deficiencies following surgery. Needed is a pragmatic and coordinated system that tracks retention and appropriate transition to adult bariatric programs.

**Objective:** To describe the development an electronic health record (EHR)-based retention and transition registry within a quality improvement framework in an adolescent bariatric surgery.

**Setting:** A Midwest Children's Hospital

**Methods:** Over a two-year period, the retention rate following bariatric surgery was low at 33%, with the decline occurring most often after the first year. Based on the baseline data, the program developed a Key Driver Diagram (KDD) that outlined a specific goal of 75% retention rate at 2 years, key drivers required to achieve the goal, and corresponding interventions which included an EMR-based patient registry (Figure 1). Using EMR in real-time, the registry is structured to proactively identify attendance at specified time intervals, guide patient follow-up and trigger a transition plan at the appropriate time. Within 12 months of implementation, rate of loss-of-follow up has improved.

**Conclusions:** The use of an EMR-based registry embedded in a quality improvement framework

offers an innovative and cost effective approach to using technology in addressing retention and transition to adult care challenges.

#### **A473**

#### **Implementation of Liposomal Bupivacaine in Laparoscopic Transverse Abdominis Plane block in Laparoscopic Sleeve Gastrectomy and effect on postoperative pain and use of Patient Controlled Analgesia - A Pilot study:**

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#### **Introduction:**

Minimizing use of Narcotics in the postoperative period is the utmost need of the hour. Narcotics, the mainstay of acute post-surgical pain has side effects that can hamper the recovery process. In our previous pilot study, we had used Bupivacaine in our transversus-abdominis-plane (TAP) block as an adjunctive pain regiment that helped us decrease the post-operative pain and requirement of postoperative narcotics. This salutary effect was short lasting. Liposomal Bupivacaine has been utilized to overcome this drawback in other studies. We thus studied if Liposomal Bupivacaine as a TAP block with laparoscopic guidance would be able to enhance the recovery in the morbidly obese population,

#### **Methodology:**

Twenty consecutive patients who underwent Laparoscopic Sleeve Gastrectomy were assigned to each arm. We used Liposomal Bupivacaine as the agent of our TAP block and compared them to our pilot group of Bupivacaine TAP block as well as our control group who were receiving the same amount of Bupivacaine as an infiltrating block around the trocar incision. We looked at various parameters during their admission.

#### **Result:**

On analysis of variance between the three groups the Pain Scale and PCA use was less at most of the instances post operatively. We found statistically significant reduction of PCA use at 2 hrs ( $p=0.03$ ) and at 12 hrs. ( $p=0.045$ ) compared to the previous two groups.

#### **Conclusion:**

Our study after initiation of using Liposomal Bupivacaine as a TAP block instead of a bupivacaine TAP block showed longer lasting post-operative advantage in controlling pain and narcotics use.

**A474**

**THE ASSOCIATION BETWEEN PROTEIN PUMP INHIBITOR METABOLISM AND EARLY (**

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**INTRODUCTION:** While protein pump inhibitor (PPI) therapy is the primary modality for prophylaxis and treatment of marginal ulcers following laparoscopic Roux-en-Y gastric bypass (LRYGB), PPI metabolism is highly variable. The aim of this study was to examine the impact of this variability on early marginal ulcer formation after LRYGB. **METHODS:** Forty-eight LRYGB patients were prospectively enrolled to undergo pharmacogenetics testing for cytochrome p450 drug metabolism. Patients were stratified by whether they were fast (rapid, ultra-rapid) or normal PPI metabolizers. Preoperative (demographic, medical, and endoscopic findings) and post-operative data (hospitalization, post-operative endoscopic findings, and marginal ulcer rate) were compared between groups. This study was not powered for statistical significance and represents preliminary data. **RESULTS:** Fifteen patients (31.3%) were deemed fast-metabolizers (Fast-Metab). The early marginal ulcer rate (<90 days) for Fast-Metab was twice that of the control group (14% (n=2) vs 7%(n=2), p=0.59). While there was no difference in operative time and baseline NSAID use between both groups, there were more former smokers (53% vs 39%, p=0.53) and baseline alcohol use (60% vs 39%, p=0.22) in the Fast-Metab cohort. Of the four early ulcers, three patients had a history of diabetes and were former smokers, while the remaining patient had no other risk factor for ulcer development apart from being a fast-metabolizer. **CONCLUSIONS:** Despite low cohort numbers, this study provides preliminary insight into a potential contributor of early marginal ulcers following gastric bypass. Given the widespread use of PPI therapy after LRYGB, these findings represent an important avenue for future studies.

**A475**

**HOSPITALIZATION AND WEIGHT LOSS CHARACTERISTICS FOR PATIENTS WITH HIGH SCORES ON THE HYPOCHONDRIASIS SCALE OF THE MMPI-2**

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**INTRODUCTION:** Hypochondriasis (Scale 1) is associated with early readmissions after bariatric surgery (BS) at our institution. This study's objective was to characterize the perioperative course for patients with hypochondriasis post-BS. **METHODS:** All primary BS



patients with scale-1 scores were retrospectively reviewed at a single institution. Patients who scored  $\geq 85^{\text{th}}$  percentile on Scale 1 of the MMPI-2 (High-Hypo  $n=127$ ) were compared to all others (Avg-Hypo  $n=207$ ) in terms of demographics, index hospitalization, 30-day hospital visits (30-HV), and post-operative weight loss. A  $p$  value  $<0.05$  was statistically significant. **RESULTS:** Compared to controls, High-Hypo patients were older (47.010.0 vs 43.910.5,  $p=0.009$ ), had higher baseline BMI (50.410.0 vs 47.37.1,  $p=0.0001$ ), had more major depression (62.7% vs 37.7%,  $p<0.005$ ) and public insurance (22.8% vs 10.1%,  $p=0.002$ ), but were less likely college educated (15.9% vs 38.4,  $p<0.005$ ). Peri-operatively, the High-Hypo group had a longer length of stay ( $p<0.00005$ ) and more non-urgent (46.2% vs 31.2%,  $p=0.01$ ) versus urgent (14.2% vs 10.8%,  $p=0.37$ ) complications. Finally, the High-Hypo group had higher overall 30-HV (18.1% vs 8.7%,  $p=0.01$ ), which were due to non-urgent (9.7% vs 3.1%,  $p=0.01$ ) versus urgent (10.3% vs 6.4%;  $p=0.21$ ) reasons. The High-Hypo group demonstrated better follow-up at 12 (79.8% vs 55.6%,  $p<0.005$ ) and 24-months (49.4% vs 36.4%), with no difference in weight-loss up to 36-months. **CONCLUSION:** High-hypo patients experienced more non-urgent complications and 30-HVs but exhibited better follow-up and comparable weight loss after BS. This suggests a role for increasing peri-operative education and early clinic utilization to reduce post-operative hospital use in this cohort.

#### A476

##### **Prolonged lead times may impact steps required for Weight Loss Surgery (WLS)**

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**Background:** Prospective WLS patients complete clinical requirements prior to WLS. Delays may contribute to increased dropout rates, worsened health outcomes, and increased mortality. Our patients complete six+ steps of clinical assessment/management: 1) obesity medicine (OM)/nutrition; 2) behavioral health; 3) pulmonary; 4) surgery; 5) medical and insurance approval; and 6) WLS. Steps 1-3 require multiple visits but steps 1-4 may occur concurrently.

**Objective:** Perform a pilot process assessment of lead time delays and variation between and among the WLS preparation process steps in our program.

**Methods:** Descriptive statistics calculated lead times from first OM appointment to each step completion and times within steps 1-3 for a random sample of 30 patients completing WLS in 2018.

**Results:** Time from first OM visit to step 6 surgery was a median of 296 days (SD 205 days). Lead time to complete step 3 pulmonary (med 169 days, SD 179 days) was longest followed by step 2 behavioral health (med 126 days, SD 184 days), step 1 OM/nutrition (med 101 days, SD 36 days), and step 4 surgical consult (med 46 days, SD 150 days). Median time from last completed clinical step (1-4) to completion of approval process was 69 days (SD 54

days).

**Conclusions:** Large variation within steps (1-3) and from the first OM visit to next steps in the WLS process exists. Understanding causes and type of variation can guide process change efforts to reduce lead times to surgery.

#### A477

### **Effect of Mobile Electronic Health Application on Postoperative Outcomes of Bariatric Surgery Patients**

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Mobile electronic health applications are increasingly used in the perioperative care of patients. SeamlessMD is one such electronic health care application which has been implemented as part of The Ottawa Hospital (TOH) Bariatric Center of Excellence (BCoE) perioperative care.

#### **Methods:**

We performed a retrospective cohort study comparing patients who had bariatric surgery at TOH before and after implementation of SeamlessMD between 2014 to 2018.

Our primary endpoints were 30-day ED visit and hospital readmission rates. Our secondary endpoints included 30-day cost of health care utilization and readmission length of stay (LOS).

#### **Results:**

We included 2003 patients (924 pre-SeamlessMD, 1079 post-SeamlessMD). Among those offered SeamlessMD, 637 (59%) used the application. We found no statistically significant differences in the rates of ED visits (7.5% vs. 8.8%,  $p=0.91$ ) or rates of hospital readmission (3.3% vs. 3.7%,  $p=0.88$ ). Lastly, there were no differences in ED visits or readmission in the SeamlessMD group based on use of the app (3.2% vs 3.7%,  $p=0.37$ ).

Patients in the post SeamlessMD group presented earlier to ED, and were readmitted to hospital on average 2d earlier ( $p=0.02$ ). Among those readmitted, LOS was lower for post SeamlessMD patients (3d vs 5.4d), with a lower total cost \$8420 vs \$3937.

#### **Conclusion:**

Use of the SeamlessMD electronic application did not affect postoperative ED visits or hospital admissions following bariatric surgery.

#### A478

### **Mental Health History and its Predictive Relationship to Bariatric Surgery Candidacy**

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#### Background

Psychosocial predictors of bariatric surgery success have been evaluated throughout the

literature. Patients with pre-existing mental health disorders have been associated with poorer surgical outcomes. The aim of this study was to evaluate pre-existing mental health with SIPAT scores as well as psychotropic medications within this population.

#### Methods

Data were collected from December 2017-March 2019, with 165 pre-surgical psychological evaluations for patients considering bariatric surgery. Mean age of the sample was 45.4 (SD = 11.08), and 143 females (86.7%) were interviewed. Mental health history was defined as a prior or current mental health diagnosis and psychotropic medication use was defined as current or prior use via self-report and EMR search.

#### Results

Descriptive statistics followed by independent sample t-tests were completed using SPSS. 107(64.8%) of the sample had a history of mental health diagnosis and 110(66.7%) had taken psychotropic medications. Both mental health history and use of psychotropic medication use significantly predicted SIPAT scores:  $t(161)=-4.47, p<.001$  and  $t(161)=-4.53, p<.001$ , mental health history and medical use predicting poor candidacy scores for bariatric surgery.

#### Discussion

Prior research identified mental health history as a predictor of poorer outcomes for patients going through bariatric surgery process. Preliminary analyses examining mental health history and use of psychotropic medications suggest that it significantly impacts surgical candidacy scores using the SIPAT. The SIPAT's total score may be a good overall indicator of a bariatric surgery patient's candidacy. Future research assessing health outcomes using the SIPAT and mental health history are necessary.

#### A479

##### **RELATIONSHIP BETWEEN URIC ACID LEVELS AND WEIGHT LOSS IN PATIENTS UNDERGOING GASTRIC BYPASS AT Y-DE-ROUX**

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**Background:** Uric acid monitoring have great importance in obese patients as the high levels are related to the worsening of cardiovascular and metabolic diseases, bariatric surgery is effective in improving health conditions and comorbidities.

**Methods:** The retrospective study consisted of patients from a private clinic in the South of Brazil submitted to *Y-de-Roux* gastric bypass between 2015 and 2016. The pre-surgical and 6-month post-operative times were compared in relation to the lost weight and uric acid levels. The statistical analysis was performed by Software R (R Core Team, 2018), using the Tukey test at 5% significance.

**Results:** The sample consisted of 120 patients, 60% women and 40% men with a mean age of 41

(+ 11.30) years. In the preoperative period the mean weight was 117.97 kg (+ 22.63 kg) and the mean uric acid was 5.47 mg / dL (+ 1.57 mg / dL). After 6 months of the surgical procedure the mean weight was 74.67 kg (+ 14.56 kg) and the mean uric acid was 4.50 mg / dL (+ 1.32 mg / dL). A significant difference ( $p < 0.05$ ) between the attributes evaluated before and 6 months after the surgical intervention was verified, and in the preoperative period, the means were higher than the post, for both the weight and uric acid values.

**Conclusion:** The postoperative period provided a reduction in uric acid levels, and thus, the importance of this control allows to alleviate the worsening cardiovascular risk, which is already part of the obese patient.

#### A480

##### **Revisional Bariatric Surgery for Failure to Lose Weight/Weight Regain and Refractory Complications at a Single MBSAQIP Accredited Center over Three Years.**

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**Background** Though the number of bariatric revisional surgeries performed in the US has increased from 6% in 2011 to 13.9% in 2016, there remains a limited amount of data available regarding their safety and efficacy. The objective of this study was to review the experience of revisional bariatric patients at our center over three years.

**Methods** A retrospective review of revisional bariatric surgery procedures performed at our center between January 2015 and December 2017 was conducted. Subjects were analyzed separately based on their indication for revision – failure to lose weight/weight regain (W-group) and/or refractory complications (C-group) following primary bariatric surgery.

**Results** 70 revisional surgeries were performed over 3 years. There were 40 W-group patients (57.14%) and 18 C-group patients (25.71%). 12 patients (17.14%) were in both groups. One year after revisional surgery, W-group patients had lost an average of 20% of their pre-operative body-weight (Figure 1). All complications among the C-group had been resolved. The primary bariatric procedures were LAGB (n=32,45.71%), RYGB (n=20,28.57%), sleeve gastrectomy (n=17,24.29%), and gastric partitioning (n=1,1.43%). 7 patients (10%) required readmission within 30 days after revisional surgery, 1 of which (1.43%) required reoperation. There was 1 leak, which did not require reoperation.

**Conclusions** Patients in the W-group experienced good weight loss after one year. Complication rates for revisional surgeries were comparable to those reported in the literature for primary procedures. Revisional bariatric surgery appears safe, and is a viable option for patients who do not respond to or have refractory complications following primary bariatric surgery.

**A481**

**Impact of a Treatment Algorithm on the Rate of Progression to Surgery and Safety Outcomes in Subjects with Type 2 Diabetes (T2DM) Planned to Undergo Sleeve Gastrectomy (SG)**

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**Background:**SG improves/resolves T2DM. Poor glucose control is an impediment for providers referring and surgeons authorizing procedures. This study compares rate-of-progression-to-surgery, glycemic control and complications between subjects presenting for surgery consultation with controlled and uncontrolled T2DM when managed by a treatment algorithm.

**Methods:**T2DM subjects planning SG after initial surgery consultation were identified. Controlled subjects(HbA1C<8%) were managed through standard practice nutrition education. Uncontrolled (HbA1C≥8%) were managed with pharmacotherapy algorithm prioritizing non-hypoglycemic/non-weight-promoting agents. The primary outcome was rate-of-progression-to-surgery and time duration between controlled and uncontrolled. Safety outcomes were glucose control, insulin requirements, hypoglycemia(<70 mg/dl) and excursions(>250 mg/dl) perioperatively; and 30-day infection(pneumonia-SSI-UTI) and readmission rates.

**Results:**Baseline HbA1c was 6.7±0.6(N=217) vs. 9.5±1.3%(N=99);p<0.01. Rate-of-progression-to-surgery was not different between controlled and uncontrolled (75% vs. 77%;p=0.751). Uncontrolled averaged 25 additional days to surgery(146±89 vs. 121±89 days;p=0.043). Uncontrolled significantly decreased fasting glucose before surgery (187±53 vs. 155±47mg/dL;p<0.01). Average hospital glucose was greater for uncontrolled at Day0,1,2 (173±43 vs.149±35mg/dL;p<0.01; 151±38 vs.128±31mg/dL;p<0.01; 142±38 vs. 116±31mg/dL;p<0.01). Uncontrolled required more daily insulin(5.2±5.4 vs.1.8±3.6U/day;p<0.01). There were no differences in hypoglycemia (4.5% vs. 4.1%; p=0.873), excursions (14.1% vs. 29.8%;p=0.094), infection (3.1% vs. 3.9%;p=0.725) or readmission (2.5% vs. 3.9%;p=0.524).

**Conclusion:**The management algorithm for controlled and uncontrolled T2DM subjects yielded rate-of-progression-to-surgery in excess of 75% in both cohorts. T2DM control status did not influence rate and only modestly increased time to surgery. Uncontrolled status was associated with higher pre-op fasting glucose, hospital glucose and insulin requirements but may not be clinically relevant as no differences in hypoglycemia, high glucose excursions, infection or readmissions were observed.

**A482**

## **Biochemical parameters of carbohydrate metabolism and the efficiency of prefrontal cortex functioning in the population of people with obesity.**

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Nicolaus Copernicus University<sup>1</sup>

### Background

Obesity and diabetes are recognized risk factors for cognitive dysfunction, and in addition, obesity is a risk factor for diabetes.

### Aim

The aim of the study was to determine the nature of the relationship between the results of the Wisconsin Card Sorting Test and the biochemical parameters of carbohydrate metabolism.

### Methods

*The study was conducted in a population of 185 people (139♀/46♂) with obesity. In 42 patients impaired fasting glycemia (IFG) and/or impaired glucose tolerance (IGT) were diagnosed, while 56 patients were diagnosed with type 2 diabetes. Evaluation of the prefrontal cortex function was performed using the Wisconsin Card Sorting Test (WCST). The biochemical evaluation was based on the determination of the level of fasting glycaemia, the result of the oral glucose tolerance test, the level of glycated hemoglobin and peptide-C.*

### Results

Patients with diabetes characterized significantly worse results of WCST. Significant positive correlations were found in the entire study group of the number of perseveration and nonperseveration errors with the level of fasting glycemia ( $p < 0.001$ ), peptide-C ( $p < 0.001$ ) and HbA1C ( $p < 0.001$ ). Significantly lower conceptual level responses correlates with higher blood glucose levels ( $p < 0.001$ ) and HbA1C levels ( $p < 0.001$ ). With the increase in all the biochemical parameters examined, the number of categories completed significantly decreased ( $p < 0.001$ ). In the subgroup of patients with diabetes, the above correlations were more significant.

### Conclusions

The results obtained indicate that diabetes is an important determinant of cognitive dysfunction in the obese population. Proper analysis and discussion are required.

## **A483**

### **Affective temperament and parameters of carbohydrate metabolism in the population of obese patients**

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Nicolaus Copernicus University<sup>1</sup>

### Background

Obesity and diabetes are chronic metabolic diseases in which psychological aspects play many important roles. Affective temperament plays a key role in the regulation of human behavior.

### Aim

The aim of this study was to determine the relationship between affective temperament and the parameters describing carbohydrate metabolism.

### Methods

*The study was conducted in a population of 185 people (139♀/46♂) with obesity. In 42 patients*

*impaired fasting glycemia (IFG) and/or impaired glucose tolerance (IGT) were diagnosed, while 56 patients were diagnosed with type 2 diabetes. The level of fasting glycemia, glycated hemoglobin and peptide-C were selected to assess carbohydrate metabolism. The Temperament Evaluation of Memphis, Pisa, Paris and San Diego Autoquestionnaire (TEMPS-A) was used to perform an analysis of the dimensions of the affective temperament.*

#### Results

There were no significant correlations between the affective temperament and the parameters of the carbohydrate metabolism in the non-diabetic population. In diabetes group, there were significant positive correlations between anxiety temperament and fasting blood glucose ( $r = 0.34$ ,  $p = 0.01$ ), C peptide level ( $r = 0.29$ ,  $p = 0.03$ ) and HbA1C ( $r = 0.40$ ,  $p = 0.002$ ). Negative correlations of depressive temperament with the level of peptide C ( $r = -0.26$ ,  $p = 0.05$ ) and HbA1C ( $r = -0.22$ ,  $p = 0.08$ ) and positive with the level of fasting blood glucose ( $r = 0.45$ ;  $p = 0.0003$ ) were also observed.

#### Conclusion

The obtained results indicate the existence of significant relationships between the dimensions of affective temperament and the alignment of carbohydrate metabolism.

## A484

### **The Impact of Severe Obesity on Pituitary Gland Structure**

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#### INTRODUCTION:

Dysregulation of the hypothalamic–pituitary–adrenal(HPA) axis and chronic-stress exposure are hypothesized to play a role in obesity development. Pituitary gland is the master endocrine-gland of the human body and its size varies with age and various pathological conditions. There is scarcity of literature about effects of obesity on pituitary morphology. Our aim is to evaluate the impact of severe obesity on the pituitary-gland volume.

#### METHODS:

After IRB approval, a retrospective review of electronic charts was performed of our bariatric-population from 2005-2018. We analyzed patients with BMI>35 and brain MRI/CTscan at surgery. Pituitary measurements were performed using 3D reconstructions from sagittal, coronal and axial planes. Measurements documented in millimeters of the pituitary gland and volume was calculated using these areas with 3D-Slicer-Sequence®-software. Mean volumes results were compared to previous published reports. SPSS was used for t-test and linear-regressions analysis.

#### RESULTS:

A total of 202 patients were included. Population was predominantly female 74%(N:151), Caucasian 80%(N:162), mean BMI=41±7 and a mean age 57±8y/o. A total of 32%(N:64)patients had brain MRIs and 68%(N:138)brain CT-scans. From the CT-scans 69%(N:95) were performed with contrast.Regarding measurements, the mean pituitary gland Sagittal-

plane=15.5±1.7mm, Coronal=12.8±2.4mm and Axial=6.7±1.8mm. Mean pituitary volume was 6.9mm<sup>3</sup>, compared to previous publications on the same age group that ranged from 4.8mm<sup>3</sup>/5.8mm<sup>3</sup>. A linear regression analysis showed a positive correlation between higher BMI and higher pituitary volumes(1.02;p=0.004).

#### CONCLUSIONS:

We found a statistically significant association between pituitary-hypertrophy and severe-obesity. Further studies with larger populations and follow-up should be performed in order to understand etiology/clinical implications of these findings.

#### A485

##### **Factors Contributing to Successful Endoscopic Management of Staple Line Leaks Following Laparoscopic Sleeve Gastrectomy**

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**Background:** Staple line leaks following laparoscopic sleeve gastrectomy (LSG) occur in approximately 3% of patients and is associated with high morbidity and mortality. Endoluminal techniques, including stent placement and endoluminal vacuum therapy (EVAC), have become viable options to treat these patients; thus, decreasing the need for additional surgery. The purpose of this study is to determine which patient factors contribute to successful endoscopic therapy in managing leaks following LSG.

**Methods:** An IRB approved prospectively maintained database was retrospectively reviewed for all patients treated for gastrointestinal leaks from July 2013 to March 2019. Endpoints include morbidity and success of leak closure for those treated with only endoscopic methods compared to additional surgery.

**Results:** There were 39 patients (34 females; 6 males) with a median age of 45.9 years. The endoscopy only group (EG) included 23 patients (59%); whereas, the additional surgery group (SG) included 16 patients (31%). On average the SG had longer days from sentinel surgery to our hospital admission (70 vs 41, p<0.05), a higher percentage of previous bariatric surgery prior to sentinel LSG (50% vs 17%, p<0.05), and a higher readmission rates following discharge (50% vs 39%, p<0.05). Total length of stay was also higher in the SG compared to the EG (45.4 vs 11, p<0.05).

**Conclusion:** Endoscopic therapies have a higher chance of success if performed earlier to their sentinel surgery and if they have had no prior bariatric surgeries. Patients who require additional surgery tend to have longer hospital stays and readmission rates.

#### A486

##### **IMPROVEMENT OF QUALITY OF LIFE IS RELATED TO PHYSICAL BUT NO TO MENTAL COMPONENTS IN THE FIRST YEAR AFTER BARIATRIC SURGERY.**



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#### BACKGROUND:

Bariatric surgery (BS) is an effective treatment for severe obesity (SO). It is associated with significant improvement in excess weight loss and comorbidities. However, changes in quality of life (QOL) have been scarcely evaluated.

#### AIM

Compare QOL changes in patients with SO before and after BS.

#### METHODS

The Short Form Health Survey 36 items (SF-36) was determined at initial interview before BS and at 6 and 12 months after it. The Bariatric Analysis and Re-reporting Outcome System (BAROS), was evaluated at 6 and 12 months after BS. Statistical analysis for related samples was performed. We considered a  $p < 0.05$  to be significant.

#### RESULTS

Baseline evaluation was done on 177 patients, 71% female, median BMI 46 kg/m<sup>2</sup> (IQR 42.39-52.7), 69 were evaluated at 6-months and 42 at 12-months. SF-36 improved in all physical components: Physical Function increased 25 points (IQR 5-40), Physical Roll 0 (IQR 0-25), Body Pain 0 (IQR -0.17-27), General Health 16 (IQR 5-35), Vitality 10 (IQR 0-28). The Physical Component Score improved 6.7 points (IQR 0-12,  $p < 0.05$ ). The mental component score was not statistically different 0.78 (IQR 0-12,  $p > 0.05$ ). The BAROS questionnaire showed most patients achieved “excellent results” at 12 months ( $p = 0.021$ )

#### CONCLUSIONS:

QOL increase after bariatric surgery is mainly associated to the physical component score. The mental component needs to be closely evaluated early after surgery to improve long term outcomes.

**A487**

#### **Is Ketogenic Diet a Grade 1a Recommendation? We Suggest an Innovative Method for Personalized Counseling and Increasing Awareness of Different Approaches for Management of Obesity**

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Rochester General Hospital<sup>1</sup> Assiut University of Medicine<sup>2</sup>

#### **Background:**

Google trends (GT) as an accessible tool has been increasingly used to explore the public interest, with recently identified discrepancy between academic and public interest in obesity approaches. We aimed to explore the public interest similarly locally in “Rochester, NY” using GT.

#### **Methods:**

The 3 major approaches for obesity treatment are life style modifications, medications, and surgeries. We compared the top 20 different diets as reported by “usnews.com”, the FDA approved medications, and the top 3 surgeries for weight loss against each other as topics on GT to explore the public interest in “Rochester, NY” in 2018, last 5, and 15 years.

**Results:**

In 2018, top 5 diets respectively are ketogenic diet (KD), vegan diet, vegetarian diet, raw food diet, and Atkins diet. The top 5 medications respectively are bupropion, topiramate, naltrexone, phentermine, and orlistat. The top 3 surgeries respectively are gastric bypass, sleeve gastrectomy, and adjustable gastric band. When we compared the top of each category against each other, ketogenic diet had significantly higher interest, followed by Bupropion and gastric bypass surgery.

**Conclusion:**

GT reflect that KD became the main interest of the public among all the other different obesity approaches with a significant increase starting in 2017. KD may accelerate weight loss, but this rapid weight loss difference disappears on the long run.

Similar to targeted direct-to-consumer advertising and direct-to-patient trials, we suggest targeted direct-to-patient counselling to target population of interest with a goal of personalized counselling and improved awareness of the recommended different lines of treatment.

**A488**

**The Use of a Pedometer to Objectively Measure Ambulation on Postoperative Day One after Bariatric Surgery**

Lawrence Tabone *Morgantown WV*<sup>1</sup>, Nova Szoka *Morgantown WV*<sup>1</sup>, Salim Abunnaja *Morgantown WV*<sup>1</sup>, Michael DeRosa *Huntington WV*<sup>1</sup>, David Borgstrom *Morgantown WV*<sup>1</sup>, Kimberly Bailey *Morgantown WV*<sup>1</sup>  
West Virginia University<sup>1</sup>

Background: Obesity is a known risk factor for postoperative venous thromboembolism (VTE). Early ambulation after bariatric surgery is an effective and common practice for VTE prophylaxis. While early postoperative ambulation has become a standard of care, rarely is it objectively measured despite readily available pedometers. Objective measurements are needed to study the effects of age, gender, and body mass index(BMI) on postoperative ambulation effort.

Methods: Using a pedometer the distance ambulated on postoperative day one was recorded for 131 patients undergoing either laparoscopic Roux-en-Y gastric bypass surgery or sleeve gastrectomy. Descriptive statistics were used to summarize distance ambulated, and multivariate regression models were conducted to examine the effect of age, gender, and BMI on distance ambulated.

Results: The mean age of subjects was  $43.3 \pm 11.3$  years (range: 18 to 69), 80.7% female. The mean BMI was  $46.5 \pm 6.15$  kg/m<sup>2</sup> with a range of 35.1 to 65.4 kg/m<sup>2</sup>. The average patient ambulation on postoperative day one was  $1,978 \pm 1,611$  steps for an average distance of 0.87  $\pm 0.71$  miles and an energy expenditure of  $1770 \pm 180$  calories. The multivariate regression models

revealed that age is significantly associated with distance ambulated. Increasing age is negatively associated with objectively recorded postoperative day one miles walked (coefficient=-0.012, p=0.03) and feet walked (coefficient=-63.64, p=0.03), but gender and BMI did not show any significant effect on distance ambulated.

Conclusion: Increasing age correlates to reduced ambulation on postoperative day one after bariatric surgery. Older patients may benefit from increased VTE pharmacological prophylaxis to offset reduced ambulation effort in the early postoperative period.

#### **A489**

#### **Bariatric Surgery Preoperative Nutrition Education Recall Test Associated with Greater Postoperative Knowledge of Vitamin Requirements and Increased 3-Month Postoperative Weight Loss**

Lawrence Tabone *Morgantown WV*<sup>1</sup>, Rachel Allio *Morgantown WV*<sup>1</sup>, Michelle Garcia *Morgantown WV*<sup>1</sup>, Lauren Shull *Morgantown PA*<sup>1</sup>, Gina Kontur *Morgantown WV*<sup>1</sup>, Cassie Brode *Morgantown WV*<sup>1</sup>, Salim Abunnaja *Morgantown WV*<sup>1</sup>, Nova Szoka *Morgantown WV*<sup>1</sup>  
West Virginia University<sup>1</sup>

Background: Patients preparing for bariatric surgery receive a significant amount of nutrition education that varies significantly among different programs. There are limited objective measures for evaluating patients' preparedness for bariatric surgery. The current study evaluated the ability of a preoperative nutrition education recall test to predict postoperative success and achievement of recommended dietary goals.

Methods: 246 patients completed a program of monthly preoperative nutrition education group classes through standardized lectures led by registered dietitians. Patients completed a preoperative test to assess nutrition education recall and subsequently a 2-week postoperative survey that assessed achievement of nutrition goals. Bivariate statistics including independent sample t-test and Pearson's correlation test were used to examine the association between total preoperative test score, self-reported completion of recommended nutrition goals, and percent excess weight loss(%EWL).

Results: Patients completed on average  $5.63 \pm 2.20$  months of nutrition education classes before having bariatric surgery. The preoperative test score ranged from 8 to 21 points with a mean of  $18.21 \pm 2.47$  points. Preoperative test scores were significantly associated with postoperative vitamin preparedness (p=0.01) and 3-months %EWL (p=0.05). Test scores were not significantly associated with achieving the recommended average daily protein consumption, daily hydration volume, need to contact the bariatric team, level of self-rated confidence in postoperative care knowledge, and %EWL at 2-weeks or 6-weeks.

Conclusion: Our preoperative nutrition education recall test scores were associated with 3-month postoperative weight loss and vitamin preparedness, but further development of

preoperative patient assessment tools are needed to predict potential for early nutrition goal failure for targeted rescue education.

#### **A490**

##### **Biomechanical Properties and Tissue Response of an Ultrathin Bovine Collagen Staple Line Buttress**

George Castillo *Deerfield IL*<sup>1</sup>, John Foley *Baton Rouge LA*<sup>1</sup>, Amy Studer *St. Paul MN*<sup>1</sup>, Kevin Lewis *Deerfield IL*<sup>1</sup>  
Baxter Healthcare Corporation<sup>1</sup>

Mismatch of tissue thickness and staple height can lead to staple-line bleeding. Reinforcement with the bovine collagen staple line buttress Peri-Strips Dry with Veritas (PSDV)(Baxter) reduces incidence and severity of bleeding, and is associated with a reduction in surgical time. A new ultrathin PSDV buttress minimizes overall tissue thickness stapled.

This study investigates the biomechanical properties and tissue response of standard thickness (PSDV) and ultrathin (PSDV-UT) bovine collagen staple-line buttresses.

Maximum load, tensile stress and strain of each buttress, 125 x 25 mm, were measured per ASTM standard D638-03 at 0.2 mm/s until failure. Tensile stress investigated elongation, tensile strain investigated dimensional change and Young's Modulus investigated deformation and stiffness.

Tissue reaction to each buttress, 8-mm diameter, were investigated in a rodent model at 1, 3 and 6 weeks. One of each buttress was implanted subcutaneously through a 3-cm dorsal incision in 10 rats per timepoint.

PSDV and PSDV-UT had similar maximum loads ( $30.1 \pm 13.2$  vs  $45.2 \pm 22.7$  N, N=8/group, P=0.14), tensile stress ( $4.1 \pm 1.3$  vs  $5.8 \pm 2.8$  MPa, P=0.14), strain ( $17.9 \pm 3.2$  vs  $23.9 \pm 10.5\%$ , P=0.16) and Young's Modulus ( $51.2 \pm 14.0$  vs  $57.6 \pm 16.6$  MPa, P=0.42).

At 1 week, histiocytes were predominant and penetrated PSDV greater than PSDV-UT (0.17 vs 0.07 mm). At 3 weeks, fibroblasts, multinucleated giant cells and histiocytes were present in mixed populations. At 6 weeks, fibroblasts predominated and penetrated PSDV greater than PSDV-UT (0.19 vs 0.14 mm).

The biomechanical properties were similar despite the different thicknesses. The tissue reaction was typical, expected and similar with slightly greater cellular penetration into the PSDV buttress.

#### **A491**

## **Disparities in access to bariatric surgery in Texas 2013-2017: an analysis of the Texas Public Use Data File**

Benjamin Clapp *El Paso TX*<sup>1</sup>, Michael Cutshall *El Paso TX*<sup>2</sup>, Evan Liggett *El Paso TX*<sup>2</sup>, Cong Phan *El Paso TX*<sup>2</sup>, Brittany Harper *El Paso TX*<sup>2</sup>, Alan Tyroch *El Paso TX*<sup>2</sup>, Ashtyn Barrientes *El Paso TX*<sup>2</sup>

Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Background:** Access to bariatric care varies across regions, ethnic and racial groups. Some of these variations may be due to insurance status or socioeconomic status. There are also regional and state variations in access to weight loss surgery (WLS). The Texas Inpatient Public Use Data File (IPUDF) and Texas Outpatient Public Use Data File (OPUDF) is a state mandated database that collects information on demographics, procedures, diagnoses and cost on almost all admissions in Texas. We used them to examine racial disparities in WLS over a 5 year period.

**Methods:** The IPUDF and OPUDF were examined from the years 2013-2017. We included all patients undergoing a gastric bypass (GB) and sleeve gastectomy (SG) and examined the demographics of these patients. Race and ethnicity are reported separately. We used United States Census Bureau statistics to determine the crude (unadjusted) procedure rate of patients undergoing WLS.

**Results:** In the IPUDF, the crude unadjusted procedure rate for Blacks undergoing WLS was 7.29 per 10,000 population followed by 6.85 per 10,000 for non-Hispanic Whites. Hispanics had the lowest rate at 3.20.

**Conclusions:** There are disparities to access for bariatric surgery in Texas. Blacks have the greatest access followed by Whites. Hispanics have the lowest procedure rate per population.

## **A492**

### **Overweight and the Prevalence of Hypertension in African American Young Adults**

Sunil Mathur *Corpus Christi TX*<sup>1</sup>, Gregory Harshfield<sup>2</sup>, Deborah Stewart *Augusta GA*<sup>2</sup>  
Texas A&M University-Corpus Christi<sup>1</sup> Augusta University<sup>2</sup>

**Objectives.** To describe the current prevalence of hypertension and the relationships between gender, overweight, and blood pressure among Africa-American Young Adults in a longitudinal cohort.

**Methods.** The participants (n=264) were from an ongoing longitudinal study (Georgia Prevention Institute) evaluating the development of cardiovascular risk factors in African-American youth and young adults. On each laboratory visit, height, weight, and blood pressure were measured. Body mass index (BMI) was calculated as a measure of general adiposity. Overweight was defined as BMI  $\geq$  25.

**Results.** Overall, overweight prevalence was 81.1%, which varied significantly by age (50.8% in the age group 19 to 25 years, 12.5% in the age group 25 to 30 years, and 36.7% in the age group above 30 years). Within females 83.6 % were overweight and within males 78.9% were overweight. The prevalence of elevated blood pressure among overweight subjects was 32.7%.

Hypertension and overweight was significantly positively correlated ( $p=0.024$ ) and increased progressively as the BMI increased. The odds ratio for SBP >120 mmHG among overweight as compared to normal weight subjects was 1.278 (95% confidence interval: 1.105, 1.479). The odds ratio for SBP >120 mmHG among males as compared females was 1.629 (95% confidence interval” 1.326, 2.000).

Conclusions. The results indicate that the cardiovascular risk in African American young adults increases with the increase in BMI, and males are at higher risk than females.

#### A493

##### **Sleeve Gastrectomy and Roux-en-Y Gastric Bypass: comparison of weight loss and control of comorbidities in a Brazilian Public Hospital**

Walkyria Paula *Brasilia*<sup>1</sup>, Flávio Vieira *Brasilia*<sup>2</sup>, Fernando Lamarca *Brasilia*<sup>2</sup>, Mariana Silva Melendez Araújo *Brasília*<sup>3</sup>

HRAN - Public Hospital<sup>1</sup> University of Brasilia, Brazil<sup>2</sup> HRAN/University of Brasilia<sup>3</sup>

Background: Sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) are the most commonly bariatric surgery techniques performed worldwide. This study aimed to compare anthropometric and clinical aspects in patients after 2 years of SG and RYGB in a Brazilian public hospital. Methods: Observational, retrospective and analytical study. Twenty-three women from a public hospital who underwent SG after 2 years were matched by age and preoperative body mass index (BMI) with 23 women undergoing RYGB. Data on weight loss; control of type 2 diabetes (DM2), hypertension, dyslipidemia and obstructive sleep apnea (OSA); and medication use to control these comorbidities were compared. Results: RYGB group had greater percentages of excess weight loss(%EWL=73.6±21.2% versus 56.6±27.5%, $p=0.02$ ) and greater percentage of weight loss (29.7±7.4% versus 21.7±9.5%,  $p=0.003$ ) compared to SG. However, the prevalences of patients with successful postoperative weight loss(%EWL>50%) were similar in both groups ( $p=0,2$ ). Both groups had a significant control of DM2 and hypertension (RYGB:  $p=0.008$  and  $p=0.001$ ; SG:  $p=0.03$  and  $p=0.008$ ; respectively). All patients in RYGB group had no longer OSA after surgery, which was not observed in SG group ( $p=0.63$ ). The use of medication to control DM2, hypertension and dyslipidemia was also statistically reduced only in RYGB group ( $p=0.004$ , $p=0.004$  and  $p=0.02$ , respectively). Conclusion: Both techniques were effective in weight loss and control of DM2 and hypertension. However, RYGB showed a significant advantage in some success parameters and clinical characteristics, such as total and excess weight loss, remission of OSA and reduction of medication use for obesity-related comorbidities.

#### A494

##### **Single Port Sleeve Gastrectomy – Safety and Feasibility**

ENAS Alawi *DUBAI*

## ALGARHOUD HOSPITAL

### Introduction

It is widely accepted that Sleeve Gastrectomy (SG) is a relatively low complexity procedure, performed in one quadrant of the abdomen and requires minimal range of movements, therefore; it can be performed through the single incision technique on lower BMI patients with equivalent outcomes of surgical morbidity and weight loss compared with conventional laparoscopic surgery.

### Objectives

Safety and feasibility of single port SG for selected patients with BMI up to 40

### Methods

Data from all consecutive patients who underwent Single Port SG (SPSG) between May 2007 and January 2019 were added to a previous retrospective study from the same department. A total of 150 patients who underwent SPSG were compared with a demographically similar 250 patients who underwent standard multiple port SG. The collected data included the operative time, subjective pain scores, length of stay, operative complications. Data regarding excess weight loss and satisfaction rate were collected after 1 year follow-up.

### Results

No statistically significant difference was found in post operative pain, length of stay and operative complications. The average operative time for Single Port SG was 71 minutes versus 64 minutes for multiple port surgery.

### Conclusion

SPSG can be routinely performed with outcomes equivalent to the surgical morbidity, postoperative weight loss, and resolution of co-morbidities found with the conventional technique. Therefore; this procedure is feasible and safe for selected patients especially those with BMI less than 40.

## A495

### **Influence of NASH on long-term outcome after bariatric surgery**

Stefan Wolter *Hamburg*<sup>1</sup>, Anna Duprée *Hamburg*<sup>1</sup>, Oliver Mann *Hamburg*<sup>1</sup>  
University Medical Center Hamburg-Eppendorf<sup>1</sup>

#### *Background*

Morbid obesity is associated with NAFLD which is one of the commonest causes of chronic liver disease. Bariatric surgery is known to improve NAFLD as well as diabetes mellitus, hypertension and hyperlipidimia. However there is few data regarding the late postoperative effect of NASH on outcome after bariatric surgery.

#### *Methods*

A retrospective analysis was performed using a study population consisted of 298 subjects. These Patients received an intraoperative biopsy at the time of bariatric surgery, because of morphologic liver changes. Histology was compared to the late postoperative outcome.

#### *Results*

The baseline the histology showed, that 116 (38.9%) Patients had no NASH, 75 (25.2%) were borderline, 107 (35.9%) had NASH and 10 (3.4%) Patients had cirrhosis. The follow up was

available for 236 Patients for a median time of 24.9 ( $\pm$  13.6) months. At the follow up the median BMI dropped from 51.6 ( $\pm$  9.6) to 36.2 ( $\pm$  7). The incidence of comorbidities improved postoperatively, diabetes mellitus 35.2% to 8%, hypertension 65.8% to 25.2%, hyperlipidemia 62.3% to 33% and obstructive sleep apnea 37.6% to 14.9%. With exception of hairloss, The NASH group showed no significant statistical effect on the late postoperative complications or on the blood chemistry at follow up.

#### *Conclusion*

Bariatric surgery can be performed in patients with NASH without increased late postoperative complication rate related to the procedure or to liver disease. The weight loss and metabolic benefit after bariatric surgery is independent of NASH.

### **A496**

#### **Single Port Sleeve Gastrectomy – Safety and Feasibility**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

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#### **Objectives**

Safety and feasibility of single port SG for selected patients with BMI up to 40

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SPSG can be routinely performed with outcomes equivalent to the surgical morbidity, postoperative weight loss, and resolution of co-morbidities found with the conventional technique. Therefore; this procedure is feasible and safe for selected patients especially those with BMI less than 40.

### **A497**



## **Reduced Trocars Omega Loop Bypass - Practical Aspects**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

### Introduction

Laparoscopic Omega Loop bypass (LOLB) has proven to be a safe and successful bariatric procedure. Typically, the procedure is performed using five to seven trocars. The urge to minimize surgical trauma and pain has led to the development of reduced trocars procedure, which has been shown to be a safe and less- invasive.

### Objectives

To assess the safety and feasibility of 3-Trocars LOLB procedure.

### Methods

526 patients underwent 3 trocars LOLB between February 2011 and January 2019. The same surgeon performed all procedures. The umbilicus was the point of optical port for all patients with a 5mm trocar and the same operative technique and perioperative protocol were used in all patients.

Data were added to a previous study from the same department. Data included operative time, subjective pain scores, length of stay, operative complications. Data regarding excess weight loss were collected after 1 year follow-up. The parameters were compared to 529 patients who had 5 to 7 trocars technique in the same time period.

### Results

A total of 526 triple-incision LOLB procedures were performed. The procedures were successfully performed in all patients. Mean operating time was 63 minutes. One patient required conversion to laparotomy, two patients leaked and required reoperation, one patient developed a pelvic abscess one week postoperatively and 3 patients dropped hemoglobin and required blood transfusion. There were no mortalities.

### Conclusion

Three trocar laparoscopic omega loop bypass is safe, technically feasible and reproducible. Operative time was acceptable and post-operative recovery and complications were comparable to 5-7 trocars technique

## **A498**

### **Calibrated Gastro-Jejunostomy Reduces the Incidence of Stenosis in Omega Loop Bypass**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

### Introduction:

The numbers of Omega Loop Gastric Bypass have increased dramatically in the middle east area in the last 15 years. It has been demonstrated that it is a rapid, safe and effective bariatric operation. Advantages include ; lower risk of anastomotic leakage, internal herniation and the ease of reversibility. Potential complications include; marginal ulcers, chronic alkaline reflux and gastro-jejunosomy (GJ) stenosis. This retrospective analysis evaluates whether suturing the gastro-jejunosomy (GJ) over a boogie effects the rate of GJ stenosis and the need for endoscopic

balloon dilatation or refashioning later on. Objectives:

Retrospective analysis to assess the effectiveness of anastomosing the GJ on a calibration tube in reducing GJ stenosis after omega loop surgery.

Methods:

A total of 429 patients of Omega Loop Bypass with GJ anastomosis over a 36F boogie were compared with a demographically similar 83 patients with the anastomosis performed without a boogie between January

2008 and January 2019 as a continuation of a previous study from the same department, with follow up period of up to 24 months.

Assessment tools were vomiting liquids and solids and GJ stenosis confirmed on fluoroscopy and endoscopy. Results: see table

Conclusion:

GJ anastomosis over a boogie reduces the risk of GJ stenosis.

#### **A499**

#### **Hiatal Surface Area CT scan measurement is useful in hiatal hernia's treatment of bariatric patients**

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Division of General Surgery & Bariatric Center of Excellence<sup>1</sup> University La Sapienza of Rome<sup>2</sup>

Introduction: Hiatal surface area (HSA) measurement has been recently proposed as useful tool for hiatal defect's tailored treatment. Multidetector CT scan (MDCT) of hiatal area was shown to be useful in hiatal hernia's (HH) management. Purpose: MDCT preoperative HSA measurement's validation as useful method in the surgical repair's decision making process of hiatal defects in candidates to antireflux ± bariatric surgery. Methods: Twenty-five obese patients (group A) candidates to laparoscopic cruroplasty ± bariatric surgery were prospectively evaluated preoperatively and after one-year, using original MDCT algorithm, compared with intraoperative HSA measurement. Twelve non-obese (group B) and 12 obese subjects (group C), without GERD or HH, were used as control groups. Results: Median preoperative HSA was 7.9 cm<sup>2</sup>, (interquartile IQR 5.97 – 9.80) while intraoperative median HSA was 6 cm<sup>2</sup> (6 – 9.5), p=0.84. Postoperative median HSA was 3.8 cm<sup>2</sup> (3.21 – 4.8), showing the cruroplasty's efficacy, comparable with HSA calculated in control groups (3.98 for B and 3.69cm<sup>2</sup> for C, p=0.8547). No statistical significant difference between MDCT preoperative measurement and intraoperative findings was observed. Conclusions: Preliminary results demonstrate MDCT scan HSA measurement's as valid, non-invasive method to predict intraoperative findings. It allows the HSA monitoring, in order to correlate the symptoms onset and failure of cruroplasty.

#### **A500**

#### **Clinical outcomes and 5-y results after laparoscopic sleeve gastrectomy in young patients (< 25 years) with morbid obesity.**

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Department of Surgical and Oncological Sciences<sup>1</sup> Padova University Hospital<sup>2</sup>

## **Background**

Bariatric surgery proved to be safe and effective in terms of durable weight loss. The aim of our study was to present and discuss our experience with laparoscopic sleeve gastrectomy (LSG) in young patients (< 25-y) treated at our Institution

## **Methods**

Young obese patients submitted LSG from January 2013 to October 2018 were included in this study. Prospectively collected baseline data included age, gender, height, weight, body mass index (BMI), previous bariatric intervention and comorbidities. Postoperative data included length of stay, intra-operative morbidity, hemoglobin values in post operative course (POD 1 and at discharge), need for reoperation, %EWL and body mass index at 3-month intervals.

## **Results**

Fifty-four young patients underwent LSG. There were 47 females and 7 males. The mean age was  $21.1 \pm 2.4$  years, the mean preoperative weight and BMI were  $129 \pm 21.3$  kg and  $45.6 \pm 6$  kg/, respectively. No intraoperative complication was reported. The mean operative time was  $55,9 \pm 11,5$  minutes, the postoperative hospital stay  $3.0 \pm 0$ . No conversion to open surgery was necessary. One patient had a staple-line leak that required a combined endoscopic and laparoscopic treatment. The mean values of hemoglobin on POD1 and at discharge were  $13.1 \pm 2.1$  and  $13.2 \pm 1.3$  mg/dl, respectively. The %EWL at 3, 6, 12, 36 and 60 months were 44, 64, 82, 82 and 91%, respectively, for those who had reached this time points.

## **Conclusions**

In our experience, LSG is safe and effective to achieve durable weight loss in young patients with obesity. Larger series and longer follow-up are needed to confirm these results.

## **A501**

### **Variation in Pre-Operative Clinical Characteristics by Health Insurance Among Women Undergoing Sleeve Gastrectomy**

Mohammad Rattu *Vineland NJ*<sup>1</sup>, Amar Joshi *Vineland NJ*<sup>1</sup>, Long Nguyen *Vineland NJ*<sup>1</sup>, Jessica Tyrrell *Vineland NJ*<sup>1</sup>, Nicole Zucconi *Vineland NJ*<sup>1</sup>, Gus Slotman *Vineland NJ*<sup>1</sup>  
Inspira Medical Center<sup>1</sup>

**BACKGROUND:** Clinical variation among women with obesity categorized by health insurance has not yet been examined. The objective of this study was to identify pre-operative clinical characteristics by health insurance status among obese females undergoing sleeve gastrectomy.

**METHODS:** Pre-operative data on 6,246 females undergoing sleeve gastrectomy was obtained from the Surgical Review Corporation's BOLD database and evaluated in four cohorts: Medicare (n=126), Medicaid (n=330), Private (n=4,424), Self-Pay (n=1,366). Variables included demographics and thirty-three medical/behavioral conditions. Statistics: ANOVA, Chi-squared equation.

**RESULTS:** Medicare/Medicaid/Private/Self-Pay age ( $55+/-13/39+/-10/45+/-11/44+/-12$ ) and BMI ( $52+/-12/50+/-10/46+/-8/45+/-8$ ) varied ( $p < 0.0001$ ). Medicare: Highest hypertension (69%), angina, CHF, DVT/PE, ischemic heart disease, pulmonary hypertension, sleep apnea (52%), obesity hypoventilation, hernia, panniculitis, cholelithiasis, stress incontinence, diabetes (55%),

gout, dyslipidemia, menstrual irregularity, leg edema, back/musculoskeletal pain, fibromyalgia, disabled, psychological impairment, and unemployed (67%) ( $p<0.0001$ ), GERD ( $p<0.001$ ), mental health diagnosis (MHD,  $p<0.01$ ); Lowest alcohol ( $p<0.0001$ ), smoking ( $p<0.001$ ), substance abuse and PCOS ( $p<0.05$ ). Medicaid: Highest asthma, liver disease, smoking ( $p<0.0001$ ) substance abuse ( $p<0.05$ ); lowest none. Private: highest PCOS ( $p<0.05$ ), second alcohol; lowest psychologic impairment ( $p<0.0001$ ), MHD ( $p<0.01$ ). Self-Pay: Highest alcohol; lowest cardiopulmonary ( $n=9$ ), abdominal/hepatobiliary ( $n=6$ ), somatic ( $n=3$ ), diabetes, gout, dyslipidemia, menstrual irregularity, fibromyalgia,  $p<0.001$ ).

CONCLUSIONS: Clinically, pre-operative female sleeve gastrectomy patients vary by insurance. Medicare females were oldest, heaviest, affected most by 24 obesity co-morbidities, but smoked, drank, and used drugs least. Medicaid were youngest with highest asthma, liver disease, and tobacco/substance abuse. Private/Self-Pay women had fewer co-morbidities in spite of doubled alcohol use versus Medicare/Medicaid. This knowledge may facilitate operation choice and improve outcomes.

## A502

### Endoscopic Gastric Botulinum as a Treatment for Obesity – Practical Aspects and Outcomes

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

#### Introduction:

Several small studies were published evaluating the effect of Endoscopic Gastric Botulinum Toxin type A (EGB) for the treatment of obesity giving conflicting results. Botulinum Toxin type A (BT-A) has a powerful inhibiting effect of long duration on the muscular contractions of smooth and striated muscles. This property has been used in the treatment of digestive illnesses characterized by muscular spasm, particularly achalasia and anal fissure Objectives:

The aims of this study are to evaluate the benefit, safety and efficacy of EGB as well as providing recommendations of injection sites in carefully selected patients.

#### Materials & Methods:

429 patients were studied between December 2012 to December 2018 as a continuation of a previous study. BMI 27-42.

Follow up period of 3-12 months and age from 18 to 59.

#### Results:

61% patients continued follow up after 6 months

33% of patients were lose to follow up

7% of patients requested to repeat the procedure either to help maintain weight lose or to try again with more compliance

17% of patients had 0 – 3kg weight lose - considered failure of procedure

All failed cases were age between 18 –21

73% of patient regained the weight after 12 months

11% complained of constipation and required laxatives

#### Conclusion:

Results are comparable to other endoscopic procedures  
Safe with no reported major complications  
Strict dietary follow up is necessary for desirable outcomes

### **A503**

#### **Gastric pouch size and Bile Reflux in Omega Loop Bypass**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

##### Introduction:

Omega Loop Gastric Bypass has gained popularity throughout the world. The numbers have increased dramatically in the middle east area in the last 10 years. It has been demonstrated that it is a rapid, safe and effective bariatric operation. Advantages of mega loop bypass include ; shorter operative time, lower risk of anastomotic leakage and internal herniation, shorter learning curve, and the ease of reversibility. Potential complications include; marginal ulcers, chronic alkaline reflux and gastro-jejunosomy(GJ) stenosis. Objectives:

Assess the effectiveness of a longer gastric pouch well below the crow's foot in omega loop surgery as compared to a shorter pouch above the crow's foot in preventing bile reflux.

##### Methods:

Retrospective analysis of 629 patients who underwent omega loop bypass between January 2008 to January 2019 as a continuation to a previous study from the same department were matched demographically. 290 patients had the gastric pouch performed above the crow's foot were compared to 339 patient who has the gastric pouch performed well below the crow's foot.

Assessment tool were symptoms of Bile reflux and vomiting bile with a follow-up period of up to 24 months

Results: See Table

##### Conclusion:

Patients with longer gastric pouch below the crow's foot had less bile reflux as compared to above crows foot with statistically significant p- value.

More comfortable eating and more gradual weight loss in patients with longer gastric pouch was observed.

### **A504**

#### **FEASIBILITY, SAFETY AND OPERATIVE OUTCOMES OF OMEGA LOOP BYPASS REVERSAL**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

Omega-loop bypass (OLB) is a well-accepted bariatric procedure to combat morbid obesity. Reversal (ROLB) to normal anatomy is a potential treatment of post OLB complications. This first laparoscopic ROLB experience from UAE strengthens the available literature on indications, technique and outcomes.

## Methods

Retrospective chart review of all patients who underwent ROLB from January 2014 to June 2017 at the Al Garhoud Private Hospital Dubai, UAE was done. Age, gender, weight, body mass index (BMI), biochemical parameters, indications for reversal, and post ROLB complications were reviewed.

## Results

A total of 16 patients underwent laparoscopic ROLB to normal anatomy. 62.5% of patients were females, age was  $34.38 \pm 7.55$  years (range, 23–56), and pre-reversal BMI was  $24.63 \pm 3.74$  kg/m<sup>2</sup> (range 18–34). The indications for reversal were debilitating nausea & early satiety (n=11), severe and frequent steatorrhea (n=3), anastomotic ulcer (n=2) and Bile reflux & cosmetic reason for excessive weight loss (n=1). The mean period of follow-up post ROLB was  $21.75 \pm 5.31$  months (range 4 to 27). The mean BMI recorded at last follow up was  $29.89 \pm 2.83$  kg/m<sup>2</sup> (range, 23.34–34.04) which represented an average cumulative weight gain of  $13.81 \pm 4.79$  kgs from their reversal baseline ( $63.43 \pm 11.09$  kgs; p=0.000), while weight loss of  $30.69 \pm 13.03$  kgs from their index OLB baseline ( $107.94 \pm 15.28$  kgs; p=0.000). Mean length of hospital stay following reversal was 2.0 days (range, 1–3). Of 16 patients, only one patient had persistent nausea post reversal which recovered completely after psychological counseling.

## Conclusion

ROLB to normal anatomy is feasible and safe therapeutic option for patients with intractable complications post OLB

## A505

### **Hiatal Hernia Repair and Conversion to Omega Loop Bypass after Gastric Band Removal**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

## Introduction

Laparoscopic adjustable gastric band (LAGB) placement might result in the development of a hiatal hernia. Although many patients remain asymptomatic, many complain of severe reflux symptoms not responsive to medical management.

## Objectives

To describe the diagnosis and treatment of Hiatus Hernia after LAGB with removal of band, conversion to Omega Loop Bypass (OLB) and using a fixation suture technique

## Materials and Methods

Patients with symptomatic hiatus hernia after LAGB proven on Barium meal, CT scan with oral contrast and endoscopy underwent removal of the band, surgical correction of the Paraesophageal hernia, including complete reduction of the hernia sac, resection of the sac, hiatal closure followed by conversion to omega loop bypass and fixation suture technique.

## Results

Operative intervention lead to resolution of symptoms. There were no postoperative complications and at 2-year follow-up, there was no sign of recurrence of the hernia.

## Conclusion

Hiatal hernia repair with OLB and fixation suture appears to be safe and effective in the

treatment of hiatal hernia after LAGB.

## **A506**

### **The Diagnostic Dilemma: A Recurrent Internal Hernia**

Jennifer Kalil *Chicago IL*<sup>1</sup>, Scott Schimpke *Chicago IL*<sup>1</sup>  
Rush University Medical Center<sup>1</sup>

This case is of a 45-year-old female with a remote history of roux-en-y gastric bypass presenting with an obstruction. Several months prior to presentation, she was having abdominal pain and underwent an exploratory laparotomy at an outside hospital. She was found to have a Petersen's hernia which was repaired.

Current work up included a CT which showed no evidence of a bowel obstruction and esophagogastroduodenoscopy (EGD) which was unremarkable and revealed a healthy gastrojejunal anastomosis with a normal roux limb. She then had a drop in her hemoglobin from 12 to 7.5. She underwent repeat EGD which showed roux limb congestion, friable mucosa with hemorrhagic appearance and ulceration. Biopsies showed superficial necrosis. She was then transferred for escalation of care and further work up was unremarkable.

Because she was having continued symptoms despite comprehensive work up, she was taken to the operating room for a diagnostic laparoscopy. Upon entering her abdomen, there was evidence of twisted mesentery. A significant portion of her small bowel had herniated through a defect in the mesentery and the bowel was run in an attempt to identify each limb of the bypass. The roux limb was run proximally from the jejunojejunostomy and a large mesenteric defect in Petersen's space was identified.

This patient was likely having intermittent obstructions due to internal herniation. The roux limb was likely intermittently twisting and becoming ischemic manifesting as abdominal pain. Because the defect was so large, the twisting would eventually self-resolve leading to a diagnostic dilemma.

## **A507**

### **Perioperative Safety and Protocol for Managing Insulin Pump Requiring Patients Undergoing Metabolic and Bariatric Surgery**

Joseph Chebli *Venice FL*<sup>1</sup>, Robert Dubiin *Englewood FL*<sup>2</sup>, Jenna DeFrancesco<sup>3</sup>  
Venice Metabolic and Bariatric Surgery<sup>1</sup> First Physicians Group<sup>2</sup> Florida State University<sup>3</sup>

**BACKGROUND:** There is little in the way of data with regard to patients undergoing metabolic and bariatric surgery and the use of continuous subcutaneous insulin infusion (CSII) pumps.

**METHODS:** A retrospective review investigated 9 patients by a single surgeon who underwent metabolic and bariatric surgery who required a continuous subcutaneous insulin infusion (CSII) pump.

**RESULTS:** We retrospectively evaluated 6 patients who underwent a laparoscopic sleeve gastrectomy (LSG) and 3 patients who underwent laparoscopic Roux-en-Y gastric bypass (LRYGB). Prior to surgery, seven patients (77.7%) were diagnosed with type 2 diabetes and 2 patients (22.3%) were diagnosed with type 1 diabetes. Mean age was 54.2 +/- 14.4 years. Mean preoperative Hemoglobin A1C was 8.2 +/- 1.1%. Mean body mass index was 43.5 +/- 6.8 kg/m<sup>2</sup>. The average length of stay (LOS) was 2.1 days. There were no mortalities. 2 patients developed ketoacidosis. A streamline protocol using perioperative insulin infusions has evolved based on our patient experience.

**CONCLUSION:** Based on our experience, metabolic and bariatric surgery can be performed safely in patients requiring insulin pumps.

## **A508**

### **Evidence of support for the Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT) as a measure of bariatric candidacy.**

Jessica Hamilton *Kansas City KS*<sup>1</sup>, Tyler Josephs *Kansas City MO*<sup>1</sup>, Lauren Holcomb *Kansas City KS*<sup>1</sup>

University of Kansas Medical Center<sup>1</sup>

#### Background

The Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT) is commonly used as a screening tool to assess transplant surgery candidacy. This tool has not been validated in the bariatric surgery population, but may be useful for evaluating candidacy. The aim of the present study was to assess the association between provider-designated SIPAT scores and psychosocial self-report measures to establish validity.

#### Methods

Data were collected from 165 bariatric surgery candidates during a pre-surgical psychological evaluation from December 2017-March 2019. The sample had a mean age of 45.4 (SD = 11.08), with females (86.7%). Participants completed PROMIS-43 questionnaire. The SIPAT score based on the structured clinical interview. Descriptive analysis using both SIPAT and PROMIS-43 scores was conducted.

#### Results

Pearson correlations were completed. Results suggested that all 8 clinical scales were significantly correlated with the total SIPAT score as follows: Physical function  $r = .216, p = .005$ ; anxiety  $r = .302, p < .001$ ; depression  $r = .343, p < .001$ ; sleep disturbance  $r = .404, p = .011$ ; social role  $r = .243, p = .002$ ; pain interference  $r = .343, p = .001$ ; pain intensity  $r = .349,$



$p < .001$ .

#### Discussion

Preliminary analyses examining concurrent validity of the SIPAT in the bariatric population appears strong. The SIPTAT's total score may be a good overall indicator of a bariatric surgery patient's candidacy. Future research assessing psychosocial predictors as well as other health outcomes are necessary in the validation of the SIPAT as tool in the bariatric surgery population.

#### A509

##### **Sleeve gastrectomy and YouTube: Assessment of patient therapeutic educational content**

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Cleveland Clinic Florida<sup>1</sup>

#### Introduction

Available sleeve gastrectomy(SG) content of patient therapeutic education(PTE) on social media is heterogeneous, unmonitored, and inadequate. We present a review of video-content to determine its quality in terms of SG-PTE, and the importance of societal engagement on content input.

#### Methods

We conducted a search using the social media search engine YouTube, with the terms: 'patient education sleeve gastrectomy'. Videos published within 1 year, with relevant content to SG and lasting  $\leq 4$ mins were included. The assessment of the contents and popularity was determined using the video power index(VPI), and quality was evaluated with the Global Quality Scores(GQS). Both objective and subjective scores were compared to determine statistical difference.

#### Results

Among 127 identified videos, 49 fulfilled inclusion criteria and were eligible for assessment. Overall, the mean duration was 131.49s, had a mean number of 615.39 views, and an average of 11.08 likes. The most prevalent video source was commercial(51.02%). Regarding video content, 53.06% focused on surgery-related information, while the most common language was English(77.55%). The average VPI for all videos was 2.99, whilst the GQS average was 2.51. There was no significant difference between scoring systems( $p=0.73$ ).

#### Conclusion

YouTube is useful for the distribution of SG-PTE. Subjectively and objectively, content seems to be comparable. However, the quality of the content is suboptimal based on average GQS. Based on our observations, societal intervention should engage in content regulation available for public access.

#### A510

## **Impact of Preoperative BMI, Hiatal Hernia Repair and Long-term %Excess Weight Loss Impact on GERD Symptoms after Sleeve Gastrectomy**

Bhavani Pokala *Omaha NE*<sup>1</sup>, Priscila Armijo *Omaha NE*<sup>1</sup>, Laura Flores *Omaha NE*<sup>1</sup>, Dmitry Oleynikov <sup>1</sup>, Vishal Kothari *Omaha NE*<sup>1</sup>  
University of Nebraska Medical Center<sup>1</sup>

### **Introduction**

Sleeve gastrectomy (SG) patients often present with gastroesophageal reflux (GERD) symptoms postoperatively. Our aim was to evaluate factors that impact GERD recidivism or de novo after SG.

### **Methods**

A single-institution retrospective review was performed for patients undergoing laparoscopic primary SG during 2014-2016. Demographics, intraoperative data and long-term percent of excess weight loss (%EWL) were assessed. Callbacks were performed to evaluate GERD symptoms preoperatively and at long-term. Logistic regression was performed for postoperative symptoms improvement or de novo GERD for the variables of age, preoperative BMI, hiatal hernia repair (HHR) and %EWL at long-term, using SPSS v25.0,  $\alpha=0.05$ .

### **Results**

49 patients were included. Majority were female (81.6%), Caucasian (95.5%) with mean age of  $54 \pm 11.5$  years and mean preoperative BMI  $45.6 \pm 7.59 \text{ kg/m}^2$ . Preexisting comorbidities were hypertension (69.4%), OSA (63.6%), dyslipidemia (42.9%), and diabetes (35%). Median follow-up was 3 years [1-10 years]. Although not statistically significant, 92.3% of patients who developed de novo GERD had a preoperative BMI  $>40 \text{ kg/m}^2$ . 36.4% of patients with starting BMI  $>50 \text{ kg/m}^2$  developed de novo GERD versus 9.1% with BMI  $<40 \text{ kg/m}^2$ ,  $p=0.064$ . Regression analysis revealed that patients who did not undergo concurrent HHR were 6.8 times more likely to develop de novo GERD at long-term. BMI, age and %EWL at long-term were not independently associated with either resolution of or de novo GERD.

### **Conclusion**

Our preliminary results revealed that concurrent HHR was independently associated with de novo GERD symptoms at long-term after SG. Age, BMI, and long-term %EWL were not associated. This information can help guide patient candidacy for SG.

### **A511**

#### **IMPACT OF WEIGHT LOSS ON BODY IMAGE PERCEPTION OF PATIENTS SUBMITTED TO GASTRIC BYPASS**

Ana Cristina MACHADO *Santa Maria*  
FEDERAL UNIVERSITY OF SANTA MARIA

Background: Body image is a multidimensional construct that is influenced by several factors, being considered the mental representation of body contours and covers physiological, social, affective and libidinal aspects. The objective of this study was to follow the impact of weight

loss, induced by gastric bypass bariatric surgery, on the perception of the body image of patients in the pre and postoperative periods of 6 months. Methods: Observational study of a longitudinal design, carried out in a private clinic in the South of Brazil. The sample consisted of 104 subjects submitted to gastric bypass. The perception of the corporal image was realized through the Brazilian scale of silhouettes for adults, adapted by Kakeshita. Anthropometric data (weight, height, BMI) were obtained through chart analysis. Follow-up occurred in the pre- and postoperative periods of 6 months. Approved by the Research Ethics Committee of the Franciscan University: 1,830,670. Results: The study consisted of 104 patients, with a mean age of 38.59 ( $\pm$  9.98) years, of which 85 (81.7%) were female and 19 (18.3%) were male. The mean value of the percentage of excess weight loss (%EWL) of patients between preoperative and postoperative was 77.35% ( $\pm$  16.70). Body image distortion was 81.7% in the pre and 77.1% in the postoperative period. The correlation between weight loss and body image distortion was considered to be very low (rs: 0.008, p = 0.957). Conclusion: Gastric bypass-induced weight loss did not impact body image distortion in bariatric patients, and most patients remained distorted postoperatively. Key words: Gastric bypass; Body image; Obesity; Weight loss.

## **A512**

### **FIRST PROSPECTIVE CLINICAL TRIAL OF A NOVEL MAGNETIC RETRACTION DEVICE DURING REDUCED PORT BARIATRIC SURGERY (ClinicalTrials.gov NCT03508674)**

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Hospital La Florida<sup>1</sup> Clinica Red Salud Santiago<sup>2</sup> Duke University<sup>3</sup>

#### **Introduction and Objective**

Surgery is constantly searching for ways to improve outcomes in order to increase patient quality of life. Magnetic retraction has the potential to maximize the benefits of minimally invasive surgery, as this innovative technology enhances exposure meanwhile reducing invasiveness. Early clinical results showed reduced pain, less scars and shorter length of hospital stay in general surgical procedures. The purpose of this study was to evaluate the safety and effectiveness of the Levita Magnetic Surgical System (LMSS) in bariatric surgery.

#### **Methods**

A prospective single-arm study was conducted using the LMSS (Levita Magnetics, San Mateo CA) for liver retraction. All adverse events (AE) were captured and summarized by relatedness to the device and/or procedure, seriousness and level of severity. The primary effectiveness endpoint was the ability to adequately retract the liver to achieve an effective exposure of the target tissue.

#### **Results**

Good Clinical Practices and ISO14155:2011(E) were strictly followed. Local IRB approval was obtained and 50 subjects underwent surgery (average BMI 40.7, max 58.2 kg/m<sup>2</sup>). All cases were performed with a reduced port technique. The average procedure time was 61 minutes. In all cases, the MSS was able to adequately retract the liver to achieve an effective exposure. No device-related severe or serious adverse events were reported.

## Conclusions

The study results demonstrate that the Magnetic Surgical System can be used in reduced port bariatric surgery in a safe and effective manner. It is interesting to highlight that this new technology might provide better patient experience and increase patient satisfaction.

## A513

### Effect of Surgery on Muscle Loss and Body Composition of Bariatric Patients

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University of Miami<sup>1</sup>

#### Objective:

Rapid weight loss is commonly seen post bariatric surgery majority in the form of skeletal muscle mass and body fat mass. This study aims to analyze the early postoperative changes at an academic tertiary referral center.

#### Methods:

Retrospective analyses of a prospectively maintained database was performed for patients who underwent LSG and LGBP in 2017. Pre-operative and one month weight, BMI, total body fat (TBF), %TBF, total muscle mass (MM), %MM, and change in above parameters were recorded. Impact of surgery on MM and %MM were analyzed by linear regression models to correct for confounders.

#### Results.

89 patients were identified, 79.8% were female, mean age was 41.7, 83 LSG and 6 LGBP. Pre and post-operative values were as follows weight 268.4lb vs 239.4lb, BMI 44.6 vs 39.5, TBF 135.7lb vs 116.4 (-18.78lb), TBF% 50.5 vs 48.73, mean MM 74.5lbs vs 67.8(-6.7lb), despite the decrease in MM, MM% remained stable 27.7% vs 28.3%.

When corrected for confounders, type of surgery, BMI, and TBF did not affect loss in MM, however age (beta -0.01 p=0.02) and sex (beta -0.568, p<0.001) pre-operative weight (beta -0.036, p=0.009), total weight loss (beta 0.78, p=0.04) were significant factors.

#### Conclusion:

Patients with high preoperative weight, advancing age, and female sex are under higher risk of MM loss reaching 1/3rd of TBF loss. Careful nutritional counseling to ensure adequate protein

intake and increased physical activity should be provided to maintain muscle mass and improve muscle strength.

#### A514

##### HEPATIC PROFILE AND WEIGHT LOSS AFTER GASTROPLASTY - 0 AND 6 MONTHS OF MONITORING

Aline Calcing *Santa Maria*<sup>1</sup>, Glauco Alvarez *santa maria*<sup>2</sup>, Luciana Patias *Santa Maria*<sup>2</sup>, Ana Cristina MACHADO *Santa Maria*<sup>3</sup>, Flaviana Pedron *Santa Maria*<sup>1</sup>, cristina moraes *Santa Maria*<sup>1</sup>, Rodrigo Pereira *Santa Maria*<sup>1</sup>, Deise Moura *Santa Maria - RS - Brasil*<sup>1</sup>

Universidade Franciscana<sup>1</sup> Universidade Federal de Santa Maria<sup>2</sup> Universidade de Santa Maria<sup>3</sup>

**Background:** Obesity is a risk factor for the incidence of various diseases, such as non-alcoholic fatty liver disease. The objective of this study was to analyze the repercussions of BS on weight loss and on the hepatic profile of super-obese individuals at two different moments: preoperative and 6 months after BS. The study is characterized by a longitudinal study design with patients submitted to BS. **Material and Methods:** The sample consisted of 120 patients, 60% female, and 40% male, with a mean age of 41 years (+ 11.30), in which the weight and serum levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST). Statistical analysis was performed by software R, using the Tukey test at 5% significance. **Results:** In the preoperative evaluation, the mean weight of the patients was 116.55 kg (+ 20.91 Kg) and in the 6 months after BS was 77.32 kg (+ 13.43). Regarding the hepatic profile, there was no significant difference between the evaluated periods, and for ALT and AST, the mean values in the preoperative period were 30.27 U L<sup>-1</sup> (+18.57 U L<sup>-1</sup>) and 26.74 (+ 11.64 U L<sup>-1</sup>), and after the BS was 26.88 U L<sup>-1</sup> (+17.12 U L<sup>-1</sup>) and 25.7 U L<sup>-1</sup> (11, 46 U L<sup>-1</sup>), respectively. **Conclusions:** It can be observed that BS was efficient in weight reduction, however, it can not yet be said that this time or even this reduction in the patients' weight was enough to control liver changes.

#### A515

##### LOSS OF WEIGHT, GLUCOSE AND HEMOGLOBIN GLYCED IN PATIENTS WITH DIABETES MELLITUS II - 6 MONTHS AFTER GASTROPLASTY

Flaviana Pedron *Santa Maria*<sup>1</sup>, Glauco Alvarez *santa maria*<sup>2</sup>, Luciana Patias *Santa Maria*<sup>2</sup>, Aline Calcing *Santa Maria*<sup>1</sup>, Deise Moura *Santa Maria - RS - Brasil*<sup>1</sup>, Ana Cristina MACHADO *Santa Maria*<sup>2</sup>, cristina moraes *Santa Maria*<sup>1</sup>, Rodrigo Pereira *Santa Maria*<sup>1</sup>  
Universidade Franciscana<sup>1</sup> Universidade Federal de Santa Maria<sup>2</sup>

**Background:** Obesity is a public health problem that has been increasing the number of bariatric surgeries (BS). Glycemic indicators such as glycated hemoglobin (HbA1c) and glucose may be affected by BS and are associated with the incidence of Diabetes Mellitus II. This study aims to analyze the repercussions of BS on weight and biochemical profile of patients in two periods: preoperative and 6 months after BS. **Material and Methods:** The weight loss and HbA1c and glucose contents were extracted from a database of patients submitted to BS. The sample consisted of 120 patients (60% women and 40% men) with a mean age of 41 (+11.30) years. The

results were compared by Tukey test at 5% significance through software R.. **Results:** Different behaviors were observed in the variables before and after BS. In the preoperative evaluation, the mean weight of the patients was 117.97 kg (+22.63 kg) and in the postoperative was 74.67 kg (+14.56 kg). Regarding the biochemical profile, there was a significant difference between the pre and postoperative values. The highest values of glucose and HbA1c were observed in the preoperative period, with a mean of 97.3 mg dL<sup>-1</sup> (+20.92 mg dL<sup>-1</sup>) and 5.81% (+1.08%), respectively, and statistically differed from the postoperative period with averages of 84.43 mg dL<sup>-1</sup> (+12.76 mg dL<sup>-1</sup>) and 5.29% (+0.61%), respectively. **Conclusions:** BS reduced glucose and HbA1c in patients submitted to BS, which may represent the reduction of risks of diseases. Therefore, the monitoring of these parameters in the late postoperative period is justified.

## A516

### **Laparoscopic sleeve gastrectomy aided in complete recovery of right hemi-diaphragm paralysis secondary to iatrogenic phrenic nerve injury: a case report.**

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University of Vermont Medical Center<sup>1</sup>

**Introduction:** Cardiac catheter ablation, including radiofrequency ablation (RFA), is the treatment of choice for recurrent refractory cardiac arrhythmias. A rare complication of cardiac ablation is right phrenic nerve damage leading to ipsilateral diaphragmatic paralysis. Patients can be asymptomatic, dyspneic, or have respiratory failure. Here we present a case of a patient with symptomatic diaphragmatic paralysis that resolved after weight loss from a laparoscopic sleeve gastrectomy (LSG).

**Objectives:** Discuss the details of this unique case and explore the possible pathophysiology of this phenomenon.

**Methods:** A 65-year-old woman underwent elective RFA for refractory atrial fibrillation. Shortly following the procedure, she developed dyspnea and right diaphragmatic paralysis from iatrogenic phrenic nerve injury. One year later, she underwent a LSG despite continued dyspnea on exertion and diaphragmatic paralysis evidence on Sniff test.

**Results:** Three months after postoperatively, the patient had lost 13.5kg and had resolution of her respiratory symptoms. Repeat chest x-ray showed normal right hemi-diaphragm positioning. One other case report showed improvement in respiratory function with a 19kg weight loss in a patient with bilateral diaphragmatic paralysis. To our knowledge, this is the first case in which bariatric surgery may have played a role in recovery of iatrogenic unilateral diaphragmatic paralysis.

**Conclusion:** Most cases of paralyzed diaphragm after cardiac catheter ablation have resolution one year after ablation. Our patient continued to have symptoms and imaging consistent with diaphragmatic paralysis until after she underwent LSG. Weight loss from the bariatric surgery may have aided in the resolution of her diaphragmatic paralysis.

## A517

## **Achalasia after Banded Roux-en-Y Gastric Bypass**

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Maryland Bariatrics<sup>1</sup>

Achalasia is an esophageal motility disorder characterized by esophageal aperistalsis and inadequate relaxation of the lower esophageal sphincter to food or liquid. It is a rare condition, but may be more prevalent in patients with a previous bariatric operation<sup>1,2</sup>. Gastric bands are known to cause pseudo-achalasia, in which a tight band mimics the failure of lower esophageal sphincter relaxation characteristic of true achalasia. While pseudo-achalasia typically resolves with band deflation or removal, Heller myotomy is the operation of choice for achalasia in patients with previous gastric bypass<sup>3</sup>. The prevalence of motility disorders in patients with gastric bands is well-established<sup>4,5</sup>, but there are no reported cases of achalasia presenting in a patient with both bypass anatomy and a gastric band. The following describes the case of a 28-year-old female who presented to our clinic with dysphagia to solids and liquids, regurgitation, and recurrent aspiration pneumonia 11 years after laparoscopic Roux-en-y gastric bypass with silastic band placement in Brazil. This was a unique diagnostic problem, as our differential diagnoses included both true achalasia and pseudo-achalasia. Evaluation included the standard workup for achalasia—an upper-GI study and esophageal manometry—but also required an enteroscopy and an abdominal CT scan to rule out pseudo-achalasia. Once the final diagnosis of true achalasia was confirmed, the patient underwent a Heller myotomy with complete resolution of symptoms. We hope to emphasize that care should be taken to rule out achalasia in the evaluation of patients with dysphagia after bariatric surgery, even when pseudo-achalasia is suspected.

## **A518**

### **IMPACT OF WEIGHT LOSS ON BODY IMAGE PERCEPTION OF PATIENTS SUBMITTED TO GASTRIC BYPASS**

Glauco Alvarez *santa maria*<sup>1</sup>, Deise Moura *Santa Maria - RS - Brasil*<sup>2</sup>, cristina moraes *Santa Maria*<sup>3</sup>, Luciana Patias *Santa Maria*<sup>1</sup>, Ana Cristina MACHADO *Santa Maria*<sup>1</sup>  
Federal University of Santa Maria<sup>1</sup> Catholic Pontificia Universidade of RS<sup>2</sup> Franciscana University UFN<sup>3</sup>

**Background:** Body image is a multidimensional construct that is influenced by several factors, being considered the mental representation of body contours and covers physiological, social, affective and libidinal aspects. The objective of this study was to follow the impact of weight loss, induced by gastric bypass bariatric surgery, on the perception of the body image of patients in the pre and postoperative periods of 6 months.

**Methods:** Observational study of a longitudinal design, carried out in a private clinic in the South of Brazil. The sample consisted of 104 subjects submitted to gastric bypass. The perception of the corporal image was realized through the Brazilian scale of silhouettes for adults, adapted by Kakeshita. Anthropometric data (weight, height, BMI) were obtained through chart analysis. Follow-up occurred in the pre- and postoperative periods of 6 months. Approved by the Research

Ethics Committee of the Franciscan University: 1,830,670.

Results: The study consisted of 104 patients, with a mean age of 38.59 ( $\pm$  9.98) years, of which 85 (81.7%) were female and 19 (18.3%) were male. The mean value of the percentage of excess weight loss (%EWL) of patients between preoperative and postoperative was 77.35% ( $\pm$  16.70). Body image distortion was 81.7% in the pre and 77.1% in the postoperative period. The correlation between weight loss and body image distortion was considered to be very low (rs: 0.008,  $p$  = 0.957).

Conclusion: Gastric bypass-induced weight loss did not impact body image distortion in bariatric patients, and most patients remained distorted postoperatively.

#### A519

##### **Surgical treatment of postprandial hyperinsulinemic hypoglycemia after gastric by pass: is it efficient?**

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CHU Lille<sup>1</sup> Hospices civils de Lyon<sup>2</sup>

**BACKGROUND:** Post-prandial hyperinsulinemic hypoglycemia (PHH) is a potential late complication of gastric bypass (GBP).

**OBJECTIVE:** To assess objectively the impact of GBP reversal (GBPr) or restrictive surgery (GBP banding (GBPb) and Gastrojejunal anastomosis resizing (GJAR)) on symptoms (SIGSTAD score) and biological characteristics of hypoglycemia.

**METHODS:** Our retrospective, bicentric, study was conducted between May 2012 and December 2018. We included consecutive patients who had pre and post-operative Glucose Continuous Monitoring (CGM), a validated tool for PHH diagnosis. We analyzed number of hypoglycemia episodes, glycemic variability represented by Standard Deviation (SD) and Mean Amplitude Glucose Excursion (MAGE). The risk of occurrence of hypoglycemia was evaluated by the Low Blood Glucose Index (LBGI).

**RESULTS:** Eight patients were included (GBPr=4; GBPb=3; GJAR=2). One patient who underwent 2 interventions was included in both groups. After surgery, the mean SIGSTAD score decreased from 15,4 $\pm$  3,5 to 6,6 $\pm$ 2,6 ( $p$ =0,008) with a disappearance of severe episodes of PHH (glycemia<40 mg/L). We observed a significant decrease of LBGI from 4,5  $\pm$ 1,5 to 2,7  $\pm$ 1,4 ( $p$ =0.01). Glycemic variability was not modified after surgery (pre vs post: SD,  $p$ =0.93; MAGE,  $p$ >0.9). The mean time spent with a low blood glucose < 70mg/L decreased after surgery from 16,7% to 8,3% ( $p$ =0,09).

**CONCLUSION:** Mean duration of hypoglycemia and hypoglycemia risk decreased after surgery but glycemic variability was not modified. Larger study population is needed to



consolidate our preliminary results.

## **A520**

### **Safe and Reproducible Method of Performing Vertical Sleeve Gastrectomy**

Aviv Ben-Meir *Willoughby OH*

Lake Health

A disposable gastric clamp has been available for bariatric surgeons in attempt to eliminate variability in shape of stomach (gastric pouch) after vertical sleeve gastrectomy (VSG) and standardize performance of the operation for approximately 18 months. It has been adopted into the approach to VSG at our institution. This is a retrospective review of our experience to determine if the gastric pouch has consistent appearance and if there have been any adverse events as a result of adoption of this technique.

We conducted a retrospective chart review of all patients having VSG at our institution after adoption of the clamp. We reviewed operative reports to determine number of staple loads and both hospital and office records to determine if there were any postoperative complications.

136 consecutive patients had laparoscopic VSG at our institution between November 29, 2017 and May 8, 2019 utilizing the clamp. A single surgeon performed all operations. All patients had fixation of the stomach with the clamp with an 18 french orogastric tube in place in preparation for stapling. There have been no intraoperative staple line misadventures. There were no leaks and no staple line bleeds. Average number of loads required to complete gastrectomy was 4 loads. All patients had esophagram on postoperative day 1.

The literature demonstrates significant variability in technique performing VSG. In our practice, utilization of the clamp has reduced the number of staple loads used, created more consistency in appearance of the gastric pouch on radiographic studies and resulted in no adverse events.

## **A521**

### **Changing the Bias in Obesity Management and Bariatric Surgery**

Sharon Zarabi *NY NY*<sup>1</sup>, Mitchell Roslin *New York NY*<sup>2</sup>

Lenox Hill- Northwell Health<sup>1</sup> Lenox Hill Northwell Health System<sup>2</sup>

**Background:** Obesity and Diabetes is considered the most significant chronic medical issue reducing life expectancy. Current treatments include pharmacological therapy, behavior modification through diet and exercise and surgery. Despite the efficacy of bariatric surgery only 1% of total candidates receive treatment.

**Objectives:** Identify barriers, physician concerns and potential misconceptions towards Bariatric Surgery (BS) and explain why with better data and safety, growth remains stagnant. Improve communication and education to prevent patient attrition when referred for bariatric evaluation

from other providers. Establish better collaboration and education between healthcare providers on topic of obesity and spectrum of care. Emphasize that obesity is a chronic disease altering energy regulation.

**Methods:** Provide educational courses to clinical providers emphasis on endocrinologists on diabetes management. Assess attitudes through Likert Scale. Data accumulated and analyzed.

**Results and Barriers Detected:** Significant proportion of physicians remain ambiguous. While many physicians acknowledge positive results of BS, many still believe it is patient responsibility. However advanced specialists (orthopedists) who refer for aggressive treatment find reluctance to multiple surgeries. In addition, PCP still do not feel well equipped to treat issues that may arise post bariatric procedures.

**Solutions:** Create patient friendly videos with state of the art technology using avatars to improve patient engagement in nonthreatening environment; Alter educational programs to emphasize Diabetes as result of physiologic changes that alter energy regulation. Instruct through proper diet with savvy apps. Create comprehensive multidisciplinary group as an intermediary to surgery. Establish programs and guidelines for PCP and endocrine on post op treatment.

## A522

### **A single-center use of Aprepitant in post-operative Bariatric Surgery patients – a promising solution to curtail postoperative nausea and vomiting**

William Fuller *La Jolla CA*<sup>1</sup>, Mike Robinson *La Jolla CA*<sup>2</sup>, Erica Bane *La Jolla CA*<sup>2</sup>, Michael Cappozza<sup>2</sup>, Mark Takata *La Jolla CA*<sup>2</sup>  
Scripps Clinic Medical Group<sup>1</sup> Scripps Green<sup>2</sup>

#### **Background:**

Post operative nausea and vomiting can lead to prolonged hospital stays and readmissions in bariatric surgery patients.

#### **Objectives:**

To compare degree of nausea and vomiting in bariatric surgical patients who received Emend in the perioperative setting to bariatric surgical patients treated in standard fashion

#### **Methods:**

An observational case-control study was completed using patients in the control group

from September 2017-December 2017 and patients in the treatment group from March 2018-June 2018 at our institution. The primary outcomes observed were length of stay (LOS), incidences of nausea, and incidences of emesis. The treatment group consisted of 70 bariatric surgery patients who underwent laparoscopic Roux-en-y gastric bypass (LRYGB), laparoscopic sleeve gastrectomy (SG), or revisional surgery (laparoscopic gastric band to gastric bypass, or laparoscopic sleeve gastrectomy to gastric bypass). The control group was comprised of 55 patients who underwent the above operations.

**Results:**

The control group had an increased number of both episodes of nausea and episodes of vomiting. There was a reduced incidence in emesis in the treatment group (p value = 0.21, not statistically significant) and nausea events/patient (not statistically significant, p value = 0.5). There were no reductions in length of stay.

**Conclusions:**

Further larger studies should be considered to evaluate the trends in postoperative nausea/vomiting in bariatric patients with the use of EMEND.

**A523**

**Long Term Follow Up: Exploring Novel Retention Strategies**

Carmela Pontillo *Bellevue WA*

Overlake Hospital Medical Center

**Long term follow-up post bariatric surgery is important for the prevention of surgery related complications and management of obesity related diseases. Compliance with long term follow-up has been associated with greater long term weight loss success and psychological well-being.**

**Patients at our center are informed of the importance of long term follow-up. However, it remains challenging to keep patients engaged and committed to their follow up clinic visits. This is especially true for patients who are beyond their first year post-surgery.**

**As part of a quality improvement initiative, our program implemented several interventions in an effort to improve long term follow. One such intervention was offering a bariatric surgery retreat for patients who were more than one year post-surgery. The goal of the retreat was to re-unite, re-engage and re-focus on the basics. Our multidisciplinary team presented on a variety of topics, lead interactive activities and facilitated group discussions.**

**Fifty-four patients registered for the retreat. Forty-four attended. Most patients were between one and two years post-surgery. Program evaluations were extremely positive with all evaluations describing the retreat as very helpful and relevant. The most common request was for continued offerings of these retreats on an ongoing basis.**

**Plans are currently underway to verify the long term follow up for each participant and determine whether the retreat served as an adjunct to their post-operative care or whether it served a substitute for missed follow up appointments?**

#### A524

#### **Presentation of Gastric Cancer 2 years Status Post Vertical Sleeve Gastrectomy Ninna N. Nana BS, Mitch Paro BA, Barry Greene MD, FACS, FASMBS, Tuesday F.A. Cook, MD, FACS, FASMBS**

Tuesday Cook *Rockville MD*<sup>1</sup>, Ninna Nana *Rockville MD*<sup>1</sup>, Mitch Paro *Rockville MD*<sup>1</sup>, Barry Greene *North Bethesda MD*<sup>1</sup>  
Maryland Bariatrics<sup>1</sup>

Gastric cancer (GC) begins development in the mucus-producing cells which line the stomach [1]. Approximately 90 to 95% of all GCs are adenocarcinoma [6]. Since the middle of the 20<sup>th</sup> century, the incidence and mortality rates of GC in high-income countries of Europe and North America have been declining [13]. While there are many risk factors for the development of gastric cancer, such as *Helicobacter pylori* infection, chronic gastritis, pernicious anemia, intestinal metaplasia, gastric polyps, smoking, or having a family history of GC [11], obesity has not been named a risk. When the link between BMI and common site-specific cancers was investigated, malignancies of the uterus, gallbladder, cervix, thyroid, kidney, and leukemia all exhibited a linear correlation with increasing BMI [12]. Stomach cancer, conversely, was found to be associated with underweight populations [12]. The vertical sleeve gastrectomy (VSG) is a surgical weight-loss procedure in which a large portion of the stomach is removed [5]. In this report, we discuss a case highlighting the presentation of metastatic gastric adenocarcinoma in a patient who had undergone a vertical sleeve gastrectomy 2 years prior. We delineate the workup and findings which led to the diagnosis. Few studies are available focusing on the development of gastric cancer after undergoing a VSG making this a rare case. We conclude that postoperative bariatric patients with abnormal findings of dysphagia, even without specific risk factors, should have malignancy listed as one of their differential diagnoses and be evaluated appropriately.

#### A525

#### **AMH and inhibin B levels in patients with obesity during IVF- a prospective study**

Amir Wiser *Kfar Sava*<sup>1</sup>, Einat Haikin-Hertzberger *kfar saba*<sup>1</sup>  
Meir Medical Center IVF Unit<sup>1</sup>

**Purpose:** The aim of this study was to examine the effect of controlled ovarian hyperstimulation (COH) during IVF on AMH and inhibin B levels in patient with obesity.

**Methods:** In this prospective longitudinal study, 27 patients were grouped according to BMI. Inhibin B and AMH levels were measured before ovarian stimulation (T0) and on hCG administration day (T1).

**Results:** The changes in AMH and inhibin B levels throughout COH were similar in obese and non-obese women. For the entire cohort, serum inhibin B levels were significantly higher at T1 compared to T0 ( $p < 0.001$ ). Both inhibin B level on T1 and the delta of inhibin B from T0 to T1 were strongly correlated with the number of oocytes ( $r = 0.88$ ,  $p < 0.001$ ,  $r = 0.76$ ,  $p < 0.001$ , respectively). Serum AMH levels were lower at T1 compared to T0 ( $p < 0.001$ ). AMH levels at

T0 were positively correlated with the number of oocytes retrieved ( $r=0.72$ ,  $p<0.001$ ).

**Conclusions:** AMH and inhibin B Levels changes during COH were similar in patients with obesity in comparison to patients without obesity; thus, adjustment for BMI is not required when testing AMH and inhibin B levels

## A526

### **The medical research gap: Are current web-based search engines enough?**

Rene Aleman *Weston FL*<sup>1</sup>, Camila Ortiz Gomez *Weston FL*<sup>1</sup>, Joel Frieder *Weston FL*<sup>1</sup>, Mauricio Sarmiento-Cobos *Weston FL*<sup>1</sup>, Juliana Henrique *Weston FL*<sup>1</sup>, Emanuele Lo Menzo *Weston FL*<sup>1</sup>, Samuel Szomstein *North Miami Beach FL*<sup>1</sup>, Raul Rosenthal *Weston FL*<sup>1</sup>  
Cleveland Clinic Florida<sup>1</sup>

#### Introduction

Research for sleeve gastrectomy(SG) implies a tedious and fallible literature retrieval process. This study aims to evaluate the quality and completeness of the most commonly used web-based bibliographic databases (WBBD).

#### Methods

In order to evaluate the completeness of the WBBDs, we limited the study to meta-analysis and examined 2 questions: (1) Which WBBDs provide the greatest number of relevant quality primary studies, and (2) determine the search engine with the most comprehensive reference recall. We retrieved all available meta-analysis using specific methodological search filters in 5 of the most commonly used WBBDs for clinical research, by using the terms 'laparoscopic SG outcomes meta-analysis'. Inclusion criteria for literature assessment included relevance to search terms and publication in the last 5 years. Following selection, both studies and WBBDs were assessed for greatest number of relevant quality primary studies and greatest relative recall yields. The relative recall was calculated by dividing the number of included meta-analysis retrieved by a search strategy and the number of meta-analysis indexed.

#### Results

Of the 112 studies reviewed, 87 fulfilled inclusion criteria. PubMed had the greatest number of relevant quality primary studies ( $N=34$ (79.07%)) and the greatest number of non-indexed studies of all WBBDs ( $N=18$ (41.86%)). However, the WBBD with the greatest relative recall was Google Scholar ( $rr=0.88$ ), followed by PubMed ( $rr=0.74$ ). In terms of relevance and quality, there was no significant difference among all WBBDs ( $p=0.42$ ).

#### Conclusion

Current WBBDs provide adequate data for specific-terms publications. However, customizable multi-disciplinary platforms might allow tailored data that could solve the research gap for literature retrieval.

## A527

### **Will GLP-1 Agonists shift the paradigm of surgical therapy in the fight against diabetes and obesity?**

Christopher Esposito *Bronx NY*<sup>1</sup>, Nissin Nahmias *Bronx NY*<sup>2</sup>

SBH Health Systems<sup>1</sup> Mentor<sup>2</sup>

The STAMPEDE trial has long been the standard-bearer for the efficacy of surgical therapy in the reduction, and in many cases, elimination of medical diabetic therapy. In this hallmark paper, surgical therapy had been proven both initially and at 5 year follow up to be superior to medical management alone with regard to medication burden, glycemic control, and weight loss. However, advances in medical therapy, particularly GLP-1 agonists, have made medical weight loss and glycemic control more effective. In this study, we propose a protocol for a randomized, controlled study seeking to evaluate the validity of the STAMPEDE trial using GLP-1 agonists with respect to glycemic control and weight loss. Specifically, whether surgical therapy (sleeve gastrectomy or gastric bypass) is superior to GLP-1 agonist in terms of hemoglobin A1c, fasting glucose, and %EWL.

## **A528**

### **The Impact of Endoscopic Bariatric Therapies on Metabolic Outcomes and Nonalcoholic Fatty Liver Disease in Veterans**

Dimpal Bhakta *New York NY*<sup>1</sup>, Violeta Popov *New York NY*<sup>2</sup>, Maureen Whitsett *New York NY*<sup>1</sup>  
New York University<sup>1</sup> NYU<sup>2</sup>

#### **Background**

Nonalcoholic fatty liver disease (NAFLD) is tied to the rise in obesity and type 2 diabetes. Bariatric endoscopic interventions may provide an option to treat patients but there is scant data at present evaluating the effects on liver disease and diabetes.

#### **Methods**

Study Type: Retrospective review of prospectively-collected patients' data at the Manhattan VA. Intervention: Intra-gastric balloon (IGB) for 6 months or endoscopic sleeve gastropasty (ESG) combined with 12 monthly visits with a dietitian. Primary Outcomes: Body mass index (BMI, kg/m<sup>2</sup>), total body weight loss (TBWL, %), HbA1c, fasting glucose (FG), ALT, liver stiffness and liver steatosis by transient elastography (TE) from baseline (IGB insertion or ESG) up to 24 months.

#### **Results**

By May 2019, 12 patients had undergone IGB procedure and had at least 3 months of post-IGB follow-up. 3 patients had undergone ESG. The average TBWL was 13%±8% at IGB removal and 13%±8% with follow up to 12-24 months. ALT decreased by 36% from baseline (46 U/L±30 to 34 U/L±29). All patients with elevated HbA1c prior to intervention subsequently normalized post-intervention (Figure 1). For ESG, the average TBWL in our practice was 18.6%±0.9% with a mean HbA1c decrease from 6.9%±1.0 at the start to 5.9%±0.4 after 10 months. In patients with NAFLD, controlled attenuation parameter (CAP) decreased by 31%±6.9 and liver stiffness by TE decreased by 34%±0.9 after IGB.

#### **Conclusions**

Endoscopic bariatric therapies lead to significant improvements in obesity, NAFLD and diabetic

parameters.

## A529

### **Remote Follow-up with a Wirelessly Connected Scale improves weight loss. Comparison with standard office follow-up. A possible solution for insufficient weight loss, weight re-gain and attrition rates.**

Yannis Raftopoulos *Holyoke MA*<sup>1</sup>, Elana Davidson *Holyoke MA*<sup>2</sup>, Kristen Chapin *Holyoke MA*<sup>2</sup>, Lindsay Pasdera *Holyoke MA*<sup>2</sup>, Marissa Chiapperino *Holyoke MA*<sup>2</sup>, Karen Robert *Holyoke MA*<sup>2</sup>, Anastasios Tsechpenakis *Athens*<sup>3</sup>

Holyoke Medical Center<sup>1</sup> Holyoke Medical Center Weight Management<sup>2</sup> Athens Euroclinic<sup>3</sup>

Insufficient weight loss (WL), weight re-gain and high attrition rates are common problems of any WL method. Intensive follow-up individualized to each patient is the suggested solution, but it is often unattainable due to financial restraints and lack of adequate human resources.

Remote follow-up was conducted with a scale, provided by Allurion Technologies Inc., that was wirelessly connected with the patient's smartphone and provided body composition analysis (RFWCS). Each patient was asked to send measurement by email or text weekly and received nutritional feedback. We compared %TBWL of: 1) Elipse intragastric balloon (Allurion Technologies, Inc.) at 16, 24 and 52 weeks with either biweekly office follow-up (BOF, N=12) or RFWCS (N=48); 2) 17 patients participating in non-surgical weight loss (NSWL) or bariatric surgery (BS) in a crossover design of equal time-intervals of BOF with or without RFWCS. The Elipse is a swallowable, fluid-filled balloon that is placed without endoscopy or anesthesia. It deflates and passes naturally at 16 weeks.

Elipse patients on BOF or RFWCS had similar age (39.4±14.3 vs. 44.1±11.1), %females (63.6% vs. 72.3%) and BMI 36.1±3.2 vs. 36.9±6.2 kg/m<sup>2</sup>). %TBWL was similar at 16 (14.7%±7.5 vs. 13.8%±4.1) and 24 weeks (14%±9 vs. 13.3%±4.9), but RFWCS had better %TBWL at 52 weeks (5.9%±10.2 vs. 14.4%±7, p=.06). %TBWL of patients participating in NSWL or BS was better after RFWCS (0.93%±2.5 vs. 3.1%±2.7, p=.023) at an average of 7.2 weeks follow-up.

RFWCS improves WL after various WL methods and it could be a used to achieve more intensive follow-up.

## A530

### **Patient Preferences Towards Characteristics to Be Used in Prioritizing Patients for Bariatric Surgery: a Discrete Choice Experiment**

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Memorial University<sup>1</sup>

**Objective:** Clinical practice guidelines recommends bariatric surgery as a management strategy for adults with severe obesity (BMI 40kg/m<sup>2</sup> or more, or BMI 35-40kg/m<sup>2</sup> with comorbidities). Eligible patients access surgery on a first-come-first-served basis and wait times can be several years. This study quantifies patient preferences towards attributes that could be evaluated when prioritizing patients for surgery. **Methods:** A discrete choice experiment was conducted via email with a sample of Canadian adults living with obesity. Six relevant attributes were identified through focus groups. Respondents completed 12 choice tasks and demographic and weight loss related questions. A multinomial logit model was used to estimate preference weights of each attribute. **Results:** A total of 515 individuals completed the survey. 59% were female, 97% made previous weight loss attempts, and 5% had bariatric surgery. On average patients prioritized individuals with: significant problems with daily activities over none (Odds Ratio (OR) 4.41; 95% Confidence Interval (CI) 4.31 to 4.52); three existing cardiovascular co-morbidities over none (OR 4.24; 95% CI 4.12 to 4.36); extreme impact on mental health over no impact (OR 3.73; 95% CI 3.64 to 3.84); six “other” co-morbidities over none (OR 3.43; 95% CI 3.31 to 3.55); waiting five years over one year (OR 1.59; 95% CI 1.46 to 1.68); and a BMI of 60 over 40 (OR 1.52; 95% CI 1.43 to 1.62). **Conclusion:** All six attributes were important to patients in the prioritization for bariatric surgery. However, the number of cardiovascular co-morbidities and the impact on daily activities were considered most important.

### **A531**

#### **Long term clinical outcomes in Obese submitted to Laparoscopic Sleeve Gastrectomy**

Juan Contreras *Santiago*<sup>1</sup>, Carmen Santander<sup>2</sup>, Ismael Court *Santiago RM*<sup>2</sup>, Jorge Bravo *SANTIAGO*<sup>2</sup>, Katrina Lolas<sup>2</sup>

Clinica Santa Maria<sup>1</sup> Clinica Santa Maria Santiago Chile<sup>2</sup>

**Background:** laparoscopic sleeve gastrectomy (LSG) is one of the most performed bariatric procedures and needs long term results to validation. **Objectives:** the aim of this study is to show long term clinical results in patients with obesity submitted to LSG in terms of excess weight loss (%EWL), resolution of associated comorbid conditions and need for revisional procedures. **Patients and Method:** retrospective cohort study. **Population:** all patients with obesity submitted to LSG by our team between january 2006 and march 2009. **Description of biodemographics,** associated comorbidities and evolution, percentage of excess weight loss (%EWL) according to follow-up and after 1, 3, 5 and 10 years and frequency of revisional procedures. **Results:** 207 patients, 61.4% female. Mean preoperative age 40.5 (±10.7) years (range:17-68), mean preoperative body mass index (BMI) 38.8 (±4.8) kg/m<sup>2</sup> (range:31-53). According to comorbid conditions, 29.5% showed hypertension (HT), 64.4% insulin resistance (IR) and 52.7% dyslipidemia (DLP).

Regarding mean %EWL according to follow up we have 92.8% (± 27) (range:35-180), 79.4% (± 32) (range: 12-180), 68% (± 32) (range: 11-100) and 61% (± 18) (range:41-78) at 1, 3, 5 and



10 postoperative years, respectively. Evolution of comorbid condition after 5 years went as follows: 60% of patients with IR and 25% DLP showed remission. 11 patients (5.4%) underwent revisional surgery.

Conclusion: in our experience, LSG has good long term results in terms of %EWL, which seem more favorable in primary surgery

### **A532**

#### **Expelling Adolescent Bariatric Surgery Barriers**

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The Brooklyn Hospital Center<sup>1</sup> Brooklyn Hospital Center<sup>2</sup>

**Since the 1970s, obesity amongst adolescents has tripled, affecting 1 in every 5 children, yet these patients experience significant delays to bariatric surgery. Our retrospective analysis aims to identify factors that create an extended latency period from an adolescent's initial bariatric surgery appointment to the day their surgery is performed.**

**Between 2017-2018, we identified 33 patients with a mean age of 18 +/- 1 years old, 85% females (n=28) and 15% males (n=5). 26 underwent a sleeve gastrectomy, while 7 had a Roux-en-Y gastric bypass with pre-operative BMIs averaging 47.22 +/- 7.9. Average total body weight loss percentage (TBWL%) 30 days post-op was 7.7% +/- 2.8 with post-operative BMIs averaging 43.54 +/- 7.45. Despite beneficial outcomes, the latency period from the patient's first visit with their bariatric surgeon to when they had surgery was 5-6 months, similar to adult cohorts, with a range of 3 to 24 months.**

**An obvious delay exists from identifying qualified candidates in the primary care setting to when patients are first seen by a bariatric surgeon. However, we identified additional procedural and consult impediments to timely care in the form of pre-op endoscopy (48.4%), as well as cardiac and pulmonary clearances (30.03%). This often unnecessary testing can provide social hurdles for families trying to coordinate appointments (60.1%), while indecision was another factor in delayed surgery (18.1%). By eliminating excessive testing and providing more social support, we can diminish the delays involved with bariatric surgery for qualifying adolescents.**

### **A533**

#### **Hamad Medical Corporation (Qatar) National Payor Program Experience with the Swallowable, Gas-filled Intra-gastric Balloon System**

Mohammed Rizwan *Doha*<sup>1</sup>, Ahmed Elnagar *Doha*<sup>1</sup>, Helmuth Billy *Ventura CA*<sup>2</sup>, Moataz Bashah *Doha*<sup>1</sup>

Hamad Medical Corporation<sup>1</sup> Ventura Advanced Surgical Associates<sup>2</sup>

**Background:** Hamad Medical Corporation, a leading government hospital provider in the Middle East, started treating patients with obesity using a swallowable, gas-filled balloon (Obalon Balloon System, San Diego, CA USA) through the Qatar national payor program. **Method:** Patients were screened using History and Physical examination and excluded for gastrointestinal symptoms. Patients were seen bi-monthly or as needed due to adverse events. A retrospective analysis of consecutive patients who started treatment in February 2018 to March 2019 was conducted in a physician-sponsored database. **Results:** 418 patients were treated with mean age  $34.2 \pm 11.3$  years, 62.0% female, mean starting weight of 96.1 (17.6) kg and BMI of  $35.3 \pm 4.9$  kg/m<sup>2</sup>. 13.0%, 65.2% and 21.9% received 3, 2 and 1 balloons, respectively. 83.0% of completed patients had >20 weeks of therapy. Mean weight loss in patients with indicated BMI (30-40kg/m<sup>2</sup>) was  $9.0\% \pm 5.9\%$  TBWL and  $8.4 \pm 5.7$  kg. Mean weight loss in indicated BMI with  $\geq 20$  weeks therapy was  $12.8\% \pm 8.0\%$  TBWL and  $11.8 \pm 6.9$  kg (3-balloons) and  $9.4\% \pm 4.8\%$  TBWL and  $8.9 \pm 4.7$  kg (2-balloons). 32.0% of patients experienced at least 1 adverse event. No serious adverse event related to the device was observed. The most common adverse events observed were gastritis (17.0%), abdominal pain (13.4%), vomiting (6.9%) and gastric ulcer (3.6%). **Conclusions:** Clinically meaningful weight loss was achieved with Obalon Balloon System especially with the 3-balloon therapy. All adverse events observed were non-serious. Use of the Obalon balloon system provides a low risk and effective weight loss option to support a national payor system for patients with obesity.

#### A534

### Hiatal Hernia Repair and Conversion to Omega Loop Bypass after Gastric Band Removal

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

#### Introduction

Laparoscopic adjustable gastric band (LAGB) placement might result in the development of a hiatal hernia. Although many patients remain asymptomatic, many complain of severe reflux symptoms not responsive to medical management.

#### Objectives

To describe the diagnosis and treatment of Hiatus Hernia after LAGB with removal of band, conversion to Omega Loop Bypass (OLB) and using a fixation suture technique

#### Materials and Methods

Patients with symptomatic hiatus hernia after LAGB proven on Barium meal, CT scan with oral contrast and endoscopy underwent removal of the band, surgical correction of the Paraesophageal hernia, including complete reduction of the hernia sac, resection of the sac, hiatal closure followed by conversion to omega loop bypass and fixation suture technique.

#### Results

Operative intervention lead to resolution of symptoms. There were no postoperative complications and at 2-year follow-up, there was no sign of recurrence of the hernia.

#### Conclusion

Hiatal hernia repair with OLB and fixation suture appears to be safe and effective in the

treatment of hiatal hernia after LAGB.

### **A535**

#### **Hiatal Hernia Repair and Conversion to Omega Loop Bypass after Sleeve Gastrectomy**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

##### Introduction

Sleeve Gastrectomy alters the normal stomach anatomy resulting in a significant incidence of hiatal hernia and gastroesophageal reflux disease. Although many patients remain asymptomatic, many complain of severe reflux symptoms not responsive to medical management.

##### Objectives

To describe the diagnosis and treatment of hiatus hernia after sleeve gastrectomy with conversion to Omega Loop Bypass and using fixation suture technique.

##### Materials and Methods

Patients with symptomatic hiatus hernia after sleeve gastrectomy proven on Barium meal, CT scan with oral contrast and endoscopy underwent surgical correction of the paraesophageal hernia, including complete reduction of the hernia sac, resection of the sac, hiatal closure followed by conversion to omega loop bypass and fixation suture technique.

##### Results

Operative intervention led to resolution of symptoms. There were no postoperative complications and at 2-year follow-up, there was no sign of recurrence of the hernia.

##### Conclusion

Hiatal hernia repair with OLB and fixation suture appears to be safe and effective in the treatment of hiatal hernia after sleeve gastrectomy.

### **A536**

#### **Hiatal Hernia Repair and Conversion to Omega Loop Bypass after Sleeve Gastrectomy**

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

##### Introduction

Sleeve Gastrectomy alters the normal stomach anatomy resulting in a significant incidence of hiatal hernia and gastroesophageal reflux disease. Although many patients remain asymptomatic, many complain of severe reflux symptoms not responsive to medical management.

##### Objectives

To describe the diagnosis and treatment of hiatus hernia after sleeve gastrectomy with conversion to Omega Loop Bypass and using fixation suture technique.

## Materials and Methods

Patients with symptomatic hiatus hernia after sleeve gastrectomy proven on Barium meal, CT scan with oral contrast and endoscopy underwent surgical correction of the paraesophageal hernia, including complete reduction of the hernia sac, resection of the sac, hiatal closure followed by conversion to omega loop bypass and fixation suture technique.

## Results

Operative intervention led to resolution of symptoms. There were no postoperative complications and at 2-year follow-up, there was no sign of recurrence of the hernia.

## Conclusion

Hiatal hernia repair with OLB and fixation suture appears to be safe and effective in the treatment of hiatal hernia after sleeve gastrectomy.

## A537

### Single Port Omega Loop Bypass – Safety and Efficacy Introduction

Enas Alawi *Dubai*

Algarhoud Private Hospital HMS

#### Introduction

Single incision laparoscopic surgery (SILS) has been performed for bariatric procedures and there are several reports in the literature about the safety and efficacy of SILS sleeve gastrectomy. However, there is no publication so far regarding SILS omega loop. In this small series of 52 cases, we have studied the safety and efficacy of the procedure in selected patients.

#### Methods

A total of 52 cases of SILS omega loop were compared to 561 cases of multiple trocars procedure during 4-years period from January 2015 to January 2019 as a continuation of a previous study in the same department. Patients were matched demographically and parameters were; operative time, operative complications, post-operative pain, length of hospital stay and patient satisfaction rate.

#### Results

The average operative time for SILS OL was 93 minutes versus 69 minutes for multiple port surgery. One patient required placement of one additional port and one had conversions to conventional laparoscopic surgery. No open surgery was needed. Pain score of 3/10 in SILS OL compared to 5/10 in the multi-trocar group. Weight loss was approximately 91% of EW in 12 months' post operatively. No patients required re-operation or readmission during the 30 days after surgery.

#### Conclusion

Single port omega loop surgery can be done safely in selected patients especially those with BMI less than 40, in the hands of experienced laparoscopic surgeons and the availability of rotating instrumentation.

**A538**

**Improving Outcomes in Outpatient Bariatric Surgery**

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The Surgery Center of Atlanta<sup>1</sup> Peachtree Surgical & Bariatrics<sup>2</sup>

**Introduction**

Currently, bariatric surgery is most commonly performed in a hospital setting with a length of stay ranging from 1 - 3 days. In this presentation, we discuss our selection process and perioperative techniques used to make ambulatory outpatient surgery outcomes safe and feasible.

**Objective**

The objectives of this presentation are to demonstrate the benefits of performing ambulatory outpatient bariatric surgery on select patients. Many bariatric patients require in-hospital stay as a result of comorbid conditions. However, these patients should be differentiated from patients of lower risk who may benefit from an outpatient approach. Additionally, we defined perioperative strategies that may consistently improve the outpatient bariatric experience.

**Methods**

We prospectively randomized patients to undergo stapling bariatric procedures either on an inpatient or ambulatory outpatient basis using selection criteria. Outcomes were measured based on, but not limited to, readmissions, ER visits, complications requiring interventional surgery, morbidity and mortality.

**Results**

Data presented in this series suggests that select patients undergoing bariatric surgery combined with defined perioperative strategies may be safely performed on an outpatient ambulatory basis.

**Conclusion**

In the field of bariatric surgery, as in the field of most disease states, there is no "one size fits all" approach. Appropriate treatment should be individualized in accordance to patients' needs. We present a protocol of patient selection and perioperative techniques that may improve outcomes in patients who undergo bariatric surgery on an outpatient basis. Such a process may very well reduce healthcare costs and possibly have impact on today's opioid crisis.

**A539**

**Is there any benefits of recording every bariatric procedure?**

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Centre Chirurgical de l'Obesite,<sup>1</sup>

**INTRODUCTION:**The critical role of the learning curve for different bariatric procedures to diminish the postoperative complication rates is very well known. Recording every procedure

could reduce every learning curve for different bariatric procedures. OBJECTIVES: The aim of our study was to evaluate the correlation between recording every bariatric surgery and postoperative analysis of early or late postoperative complications. METHODS: 377 patients underwent a bariatric procedure between January 2018-January 2019. There were: 314 sleeve; 54 bypass and 9 bands. All procedures were recorded and all patients were enrolled in IFSO registry. RESULTS: There were 10 patients with surgical postoperative complications: 3 leaks, 6 hemorrhages and one stenosis. All complications were recorded following sleeve except one bleeding from jejuno-jejunal anastomosis. In 3 cases a site of active bleeding was identified. After reviewing the video, in 2 cases the site was correlated with the initial procedure. 2 out of 3 cases of leak following sleeve was treated purely endoscopic and no potential mechanism was identified. Two other potential benefits were identified: a better evaluation of gastric pouch for the treatment of ulcer postbypass and the review of two perioperative incidents with the whole team. Two negative diagnostic laparoscopies were performed. All other cases were completed by laparoscopy with no conversion. CONCLUSION: To record every bariatric procedure could help in understanding the mechanism of certain complications, especially when the analysis is performed within the team. Still recording the procedure did not prevent the negative diagnostic laparoscopy, but could play in the future a role from medico-legal aspect.

#### **A540**

#### **Sociocultural Factors Influencing Eating Practices Among Office Workers in Urban South Korea**

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KANGBUK SAMSUNG HOSPITAL<sup>1</sup> Hallym University<sup>2</sup>

Objective: To understand the sociocultural factors affecting the eating behaviors of South Korean employees.

Design: In-depth individual interviews.

Setting: Two metropolitan areas of South Korea.

Participants: Thirteen male and 9 female office workers.

Phenomenon of Interest: The effects of sociocultural factors on office workers' eating behaviors.

Analysis: The researchers transcribed and analyzed audio-recorded interviews using thematic analysis.

Results: Among social and economic factors, participants with a family described a connection between

female employment and lower frequency of home-cooked family meals. Working parents felt guilty about

their need to depend on eating outside the home and eating processed foods because of their schedules. In

addition, competitive and stressful working environments negatively affected workers' nutritional choices.

Regarding cultural factors, given the powerful influences of collectivism and Confucianism on daily life,

hierarchy and group harmony clearly had an important role in workers' everyday food choices. These

included choosing menus that were most suitable for group meals and having to miss dinnertime while waiting until higher-position workers to leave work in the evening. Conclusions and Implications: In this sociocultural setting, targeting office workers and changing social norms for healthy eating may be more effective than providing individualized interventions. These findings may be transferable to other, similar Asian countries.

#### **A541**

##### **Body Composition Analysis of Youth Pre and Post Bariatric Surgery**

Melissa Santos *Newington CT*<sup>1</sup>, Hailey (Beiner) Handzel *Hartford CT*<sup>2</sup>, Jessica Zimmerman *Hartford CT*<sup>3</sup>, Christine Finck *Hartford CT*<sup>3</sup>  
Connecticut Children's Medical Center<sup>1</sup> CT Children's<sup>2</sup> CCMC<sup>3</sup>

Different metrics have been suggested as measures of weight loss and improved health. However, few studies have examined various aspects of body composition pre and post adolescent bariatric surgery. This abstract will summarize findings from a sample of youth who underwent bariatric surgery and highlight suggestions for future research and care.

A small subset of adolescents (N = 9) who underwent the laparoscopic sleeve gastrectomy procedure, participated in a prospective database for the use of their data and had body composition analyses from approximately six months prior to surgery, one month prior to surgery and six months after surgery were included in this study. Body composition was measured with a Tanita scale.

Pre surgically 6 of the 9 adolescents lost fat percentage while all lost fat percentage after surgery. Post surgically, muscle mass decreased in all but one adolescent and Body Mass Index (BMI) decreased in all. 6 of the 9 adolescents were 18 at the time of surgery allowing for examination of more body composition factors. Total body water decreased for all following surgery and bone mass decreased in 5 of the 6 adolescents. Basal metabolic rate decreased in all adolescents after surgery while metabolic age increased in 3.

These results in a small sample show a variety of body changes following bariatric surgery. By examining measures of weight and body composition, it may be possible to craft strategies to improve their health including optimization of postoperative nutrition and more comprehensive measures of progress outside of weight loss.

#### **A542**

##### **Pre and Post-Operative Comparisons Between Adolescents and Young Adults undergoing Bariatric Surgery**

Melissa Santos *Newington CT*<sup>1</sup>, Richard Seip<sup>2</sup>, Darren Tishler<sup>3</sup>, Pavlos Papasavas *Hartford CT*<sup>3</sup>, Christine Finck *Hartford CT*<sup>4</sup>  
Connecticut Children's Medical Center<sup>1</sup> HH<sup>2</sup> Hartford Healthcare<sup>3</sup> CCMC<sup>4</sup>

With the increasing rates of obesity and its comorbidities occurring in younger ages, the use of bariatric surgery has increased in adolescents. However, limited research has examined the impact of age on bariatric surgery pre-operative presentation or post-operative course. Data on 4,235 patients who underwent index bariatric procedures in 2017 was extracted from the MBSAQIP PUF. Pre and post-operative variables in 289 adolescents (age: 13-17.99; mean 16.73; SD = 1.04) were compared to 3,946 young adults (age: 18 - 22.99; mean 20.90; SD = 1.42). No statistically significant differences were seen in pre-operative Body Mass Index (BMI) closest to surgery (46.69 in adolescents vs 47.26 in young adults) or highest recorded BMI (48.38 in adolescents vs 48.95 in young adults) between groups. More Hispanics underwent surgery as adolescents than young adults (29.4% vs 20.2%;  $p = .01$ ). 14.5% of adolescents were on treatment for diabetes versus 9.7% of young adults ( $p < .05$ ). Over 20% of adolescents had obstructive sleep apnea versus 14.7% of young adults ( $p < .05$ ). Young adults had a greater number of visits for treatment of dehydration and visits to an emergency department. Bariatric surgery is often seen as the treatment of last resort for adolescents. These findings suggest that adolescents undergoing bariatric surgery do not have increased risk of post-operative complications and may have a less complicated post-operative course. However, their pre-operative presentation may be more impaired with a greater impact of diabetes treatment and obstructive sleep apnea suggesting a need for earlier, and more intense, intervention.

#### **A543**

##### **A retrospective study of revision operations for inadequate weight loss or weight regain after sleeve gastrectomy in 74 patients at a single institution by a single surgeon**

Mohit Bhandari *Indore*<sup>1</sup>, Mathias Fobi *Indore CA*<sup>2</sup>, Winni Mathur *INDORE*<sup>2</sup>, SUSMIT KOSTA *Indore*<sup>2</sup>

Sri Aurobindo Medical College & PG Institute<sup>1</sup> MOHAK BARIATRICS AND ROBOTICS<sup>2</sup>

#### **Background**

There are many options to revise patients who have had either inadequate weight loss or significant weight regain after a sleeve gastrectomy operation. A study on the outcome of three types of revision operations, re-sleeve, and revision to one-anastomosis gastric bypass (OAGB) and banded gastric bypass (BGBP) was done.

#### **Method**

The data from a prospectively maintained database of patients who had a revision sleeve gastrectomy operation were identified, collected and analysed.

#### **Results**

Seventy-four patients had a revision with up to three years follow up. The revisions occurred two to six years after the initial operation. Five patients were re-sleeved, 32 were revised to an OAGB, and 37 were revised to a BGBP. All patients lost weight after the first year of the revision. There was weight regain in the re-sleeve, and OAGB revised patients at two and three years. Patients with the BGBP revision were still losing weight after two years.

#### **Conclusion**

All patients in this study who had a revision operation after sleeve gastrectomy for either



inadequate weight loss or weight loss regain lost weight at one year of the revision. There is a trend for weight regain after one year in the patients that were re-sleeved or revised to OAGB. There is a need for longer-term follow-up, more great series and multicenter studies to collaborate these findings.

#### **A544**

##### **Short-Term Outcomes of Robotic versus Laparoscopic Bariatric Surgery**

Lisa Parker *Dallas TX*<sup>1</sup>, Krystha Cantu *Dallas TX*<sup>1</sup>, Gerald Ogola *Dallas TX*<sup>1</sup>, Daniel Davis *Dallas TX*<sup>1</sup>

Baylor University Medical Center<sup>1</sup>

##### **Background:**

Bariatric surgery aims to achieve weight loss and reduce weight-related co-morbidities with minimal complications. Laparoscopic bariatric surgery has long been the standard with an acceptably low complication rate. There is a growing body of evidence regarding robotic bariatric surgery and its outcomes. However, the precise role of robotics in bariatric surgery is not yet defined.

##### **Methods:**

Patient who underwent either laparoscopic or robotic sleeve gastrectomy (SG) or roux-en-y gastric bypass (RYGB) from 2016 to 2018 by a single experienced bariatric surgeon at Baylor University Medical Center were included. A retrospective chart review of 314 patients in a prospective data base primarily examined length of stay and 30 day readmissions and complications for the two groups of patients.

##### **Results:**

The operation duration was longer for the robotic surgeries: 102.5 vs. 82.8 minutes for SG and 175.7 vs. 136.1 minutes for RYGB. There was a trend towards a shorter hospital stay for the robotic bypass group (3.5 vs. 1.3 days) but this was not statistically significant. There were no significant complications and the readmission rate was under 5% with no difference between robotic and laparoscopic groups for both SG and RYGB.

##### **Conclusion:**

Bariatric surgery can be safely performed both robotically and laparoscopically with acceptably low rates of complications and readmissions. Although there were not enough numbers to obtain a statistical significance there was a trend towards shorter hospital stays, possibly justifying the longer operative time for robotic RYGB.

#### **A545**

## **Creating Evidence Based Care for Adolescents who are Transgender or Gender Non-binary with Severe Obesity.**

Melissa Santos *Newington CT*<sup>1</sup>, Priya Phulwani *Hartford CT*<sup>2</sup>, Christine Finck *Hartford CT*<sup>2</sup>  
Connecticut Children's Medical Center<sup>1</sup> CCMC<sup>2</sup>

The incidence rate of gender dysphoria is estimated as ranging between 0.5 and 1.3%. Increasingly, youth are seeking medical and surgical interventions to align their physical features to their affirmed gender at younger and younger ages. Likewise, more adolescents are seeking bariatric surgery as treatment of their severe obesity. We therefore have a rising number of transgender and gender non-binary adolescents presenting to bariatric surgery programs. However, no guidelines exist for this subset of patients who have unique needs and concerns in their management. A PubMed search finds 0 articles on bariatric surgery in these populations. Research strongly supports that youth with gender incongruence are less likely to access healthcare and once they do, if health care providers are not using appropriate respectful language, these youth will likely be lost to care. Furthermore, research suggests a greater need for screening of eating disorders in transgender youth particularly in the use of compensatory behaviors such as diet pills, vomiting or laxatives. As such, this abstract will review the process of one program in effectively managing this population. Members of a bariatric surgery program representing surgery, endocrinology and psychology will highlight the key points of consideration when evaluating patients who are transgender including use of appropriate language. This abstract will discuss the management of those who have begun the process to transition gender, including hormone management, as well as those are seeking bariatric surgery prior to transitioning gender. Suggestions for further research will also be discussed.

## **A546**

### **Sleeve Gastrectomy in Children Under 14**

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Montefiore Medical Center<sup>1</sup> Columbia University Medical Center<sup>2</sup>

#### **Background**

Obesity is a national health epidemic increasingly affecting adolescents and young children. While bariatric surgery is an established therapeutic option in adults and adolescents, its short and long term outcomes in children, especially those under 14, is underreported.

#### **Methods**

14 children under the age of 14 with morbid obesity who underwent laparoscopic sleeve gastrectomy (SG) were evaluated over a 5year period (2015-2019). Patient characteristics, comorbidities, operative outcomes, and long-term follow-up were evaluated by univariate analyses.

#### **Results**

Median age at SG was 11.9 [range 8.5-13.4], majority being females (78.6%). 6 patients (42.9%) were under 12 years old. Average total duration of follow up was 10.8 months ( $\pm 13$ ). There were

no operative mortalities. Two patients required early re-exploration for post-operative complications. One patient was readmitted within 30 days for dehydration and thiamine deficiency. All patients experienced a net loss in weight and body mass index (BMI). Median overall %change in BMI was 17.5% [7.6-29.9] with corresponding %change in excess BMI of 32% [12-105]. Idiopathic intracranial hypertension, depression, and obstructive sleep apnea were among comorbidities that improved as early as 6 months. In children under 12, there was a longer duration of follow-up and a higher percentage of weight loss and change in BMI.

#### Conclusions

Bariatric surgery is a safe and effective method of achieving weight loss in the pre-pubertal period. Although it is not without complications in this population, resolution of comorbidities occurred without mortality or significant morbidity.

#### A547

#### **Impact of smoking status on post-operative complications in patients undergoing bariatric surgery**

Jeffrey Diamond *Gainesville FL*<sup>1</sup>, Jeffrey Friedman *Gainesville FL*<sup>1</sup>  
University of Florida<sup>1</sup>

#### Setting:

Smoking status is a significant risk factor for postoperative complications following bariatric surgery. While previous studies demonstrated the impact of smoking status on immediate post-operative outcomes, the minimum tobacco free time to avoid this increased risk is unknown.

#### Objectives:

This study investigates the impact of tobacco free duration on post-operative complications in patients undergoing laparoscopic sleeve gastrectomy and Roux-En-Y gastric bypass.

#### Methods:

A retrospective analysis was performed on data collected from one year of follow-up visits. Patients were assigned to one of four groups; no prior history of tobacco use, remote history, recent history, and current. Remote history was defined as tobacco use more than one year prior to operation while recent use was defined as tobacco use within one year of the operation. We compared the risk of post-operative complications using Firth's-bias-reduced logistic regression as well as Analysis of variance (ANOVA) model to study the effect of smoking status on percent excess weight loss.

#### Results:

Of the post-surgical complications, no statistically significant difference in frequency was found between groups other than the occurrence of Ulcers. The recent use group demonstrated an increased risk of ulcer, with an odds ratio of 7.24 and a p-value of 0.001.

#### Conclusions:

Recent smoking cessation, within one year of bariatric surgery, poses an increased risk for ulcer formation. Further investigation is necessary to determine a more precise cutoff at which the risk is most significantly decreased.

**A548**

**Single-anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S): long term results and complications. A single institution experience**

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University of Rondonia and Universitat Autònoma de Barcelona<sup>1</sup> Hospital Vall d'Hebron<sup>2</sup>

**Introduction.**

Duodenal switch (DS) is one of the most important malabsorptive procedures for obesity treatment. A variant of the BPD-DS, called the single-anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S), has been recently accepted by bariatric societies. It decreases the number of anastomosis and surgical time of DS. The aim of that paper is to present long term outcomes and acute-chronic complications. **Patients and method:** A retrospective analysis of a prospective database of all patients who underwent a SADI-S. **Results:** 48 patients were underwent a SADI-S between 2010 and 2019. Most of all (89%) were underwent a SADI-S as a second step after Sleeve gastrectomy and 35 of them were women (73%). The mean age was 46.3±9.5 with a preoperative body mass index (BMI) of 40.8±4.6 Kg/m<sup>2</sup>. The common channel was performed in three different measurements: 200 (4), 250 (17) and 300 cm (27). The patients were discharged after 3±3.2 days. Follow-up time was 33±5.8 months and percent of excess weight loss (%EWL) was 63.8% (table 1). The main complications were duodenoileal anastomosis leakage in 6.2% and hypoalbuminemia in 14.5% (Figure 1). The last ones needed a proximalization of the anastomosis. Three cases presented severe GERD and needed hiatoplasty (1 case) and conversion to Gastric bypass (2 case). The mortality rate was 0%. Weight regain appeared in all patients with proximalization anastomosis.

**Conclusion:** SADI-S presented a good result as a malabsorptive procedure in our casuist. Meticulous follow-up of patients is important in order to identify complications and treat adequately.

**A549**

**Discordance in Radiologic Interpretation of Laparoscopic Adjustable Gastric Band Complications**

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Loyola University Medical Center<sup>1</sup> Loyola Stritch School School of Medicine<sup>2</sup> Loyola University Medical Center<sup>3</sup>

**Introduction:**

High incidence of adjustable gastric band (AGB) complications has led to increased frequency of band removal procedures. Accurate interpretation of upper gastrointestinal series (UGI) in symptomatic patients is paramount to timely complication management.

**Methods:**

We performed a retrospective review of AGB removals Jan 2013-March 2019 at a single institution. Indication for removal was classified as uncomplicated (weight recidivism or GI symptoms) or complicated (band slip or erosion) based on perioperative findings. Preoperative surgeon and radiologist UGI interpretations were evaluated for agreement regarding presence or absence of abnormalities. Concordance among physician reviewers were calculated excluding observations with missing interpretation.

**Results:**

Of 143 band removals, 97 (57.8%) were performed for uncomplicated indications and 46 (32.2%) were for complicated indications. Isolated band removal was performed in 95 (66.4%) of patients, while 48 (33.6%) underwent conversion to sleeve or bypass as a one-stage procedure. Surgeon and radiologist UGI interpretations were available in 91 (63.6%) cases. When examined for esophageal or pouch dilation, abnormal phi angle, band slip, reflux, or erosion: surgeon and radiologist concordance were highest when evaluating for erosion (98.9%), and pouch dilation (90.1%), while concordance was lowest when evaluating for reflux (81.3%), or band slip (79.1%). In patients with a complicated indication, concordance was optimal for erosion (96.9%), and esophageal dilation (84.4%), but remained poor for reflux (75.0%), and band slip (59.4%).

**Conclusion:**

In patients undergoing AGB removal at a single institution, rate of surgeon and radiologist agreement on UGI findings differs, particularly in patients with evidence of band slip.

**A550****Indocyanine Green Mesenteric Angiography as an Intraoperative Assessment of Bowel Perfusion in Revisional and Primary Bariatric Operations. Assessment of 50 Cases, Operative Findings and Surgical Interventions Taken**

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Ventura Advanced Surgical Associates<sup>1</sup> Community Memorial Hospital<sup>2</sup>

**Background**

Insufficient blood flow has been hypothesized as a cause of leakage in bariatric surgery. Inadequate or decreased blood flow of the roux limb, the gastrojejunostomy, the angle of Hiss and the duodenal-ileostomy in bariatric operations can be assessed via Indocyanine Green fluorescent imaging intraoperatively. We assessed the usefulness of Indocyanine green fluorescent blood flow imaging of these structures during Roux Y gastric bypass, duodenal switch and sleeve gastrectomy. Both primary and revisional procedures were studied.

**Materials and Methods**

50 consecutive patients undergoing primary or revisional Roux Y gastric bypass, vertical sleeve gastrectomy and duodenal switch operations were included in this study. 7.5 mg of ICG was injected intravenously followed by a 10cc saline bolus. For Roux Y gastric bypass the initial ICG bolus allowed evaluation of the Roux limb and the gastric pouch. A second bolus allowed

evaluation of the final gastrojejunostomy. For sleeve gastrectomy a single bolus allowed evaluation of the entire vertical sleeve and in duodenal switch an initial bolus allowed evaluation of the transected duodenal stump. A second bolus allowed assessment of the duodenoileostomy.

## **Results**

In three cases decreased or absent ICG blood flow was identified resulting in resection of a portion of the roux limb. Decreased but adequate perfusion was seen in the duodenal stump of every duodenal switch. There were no leakages and no postoperative complication in the 50 cases studied.

## **Conclusions**

Imunocyanine green florescent blood flow imaging may be useful for assessing anastomosis and staple lines in bariatric operations

## **A551**

### **Four ports combined cholecystectomy with sleeve gastrectomy – a new technique challenge**

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Helwan university<sup>1</sup> general surgery resident<sup>2</sup> lecturer Helwan university<sup>3</sup>

## **Background**

Cholelithiasis is a very common comorbidity in morbidly obese. Cholecystectomy at the time of Laparoscopic sleeve gastrectomy (LSG) is a proper solution that usually done by five port technique. Using four ports technique is safer, less painful and no ugly scar resulted from the Epigastric port. We here showing our results in Helwan University Hospitals from 2016 to 2019.

## **Methods**

Patients with symptomatic Cholelithiasis, underwent LSG in addition to cholecystectomy by four ports technique, between 2016 and 2019, and were compared to those who had the procedure by five port technique. Gender, age, and BMI were noted. Preoperative ultrasonography was performed for all patients and gallstone presence was recorded. Operative time, perioperative complications, length of hospital stay and post-operative pain analysis.

## **Results**

LSG was performed in 1320, of whom 800 (60%) had asymptomatic Cholelithiasis. 250 (48%) patients underwent four port technique, while 270 (51.9%) patients underwent five port technique. cholecystectomy patients had a higher percentage of females and were older (82 % and 48 years vs. 70 % and 45 years, respectively). BMI, Length of hospital stay, and complications were similar. 20 % required cholecystectomy during the first post-operative year after LSG due to evolution of symptoms.

## **Conclusions**

Four ports combined cholecystectomy with sleeve gastrectomy is a new technique challenge that is safe, less painful and gives a solution for the ugly scar resulted from the Epigastric port.

**A552**

**Escalation of Therapies in Adolescent Bariatric Surgery**

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Connecticut Children's Medical Center<sup>1</sup> Children's National<sup>2</sup> Arkansas<sup>3</sup> CCMC<sup>4</sup>

**Background:** With the increasing rates of severe obesity, the use of bariatric surgery in increasingly younger years is rising. This has led programs to have to consider the long term management of adolescents in their care and begin to develop pathways and protocols to manage clinical care situations previously believed to just be needed in adult centers. Currently, no research exists on the management of adolescents who require an escalation of therapy either through medication management or surgical revision following bariatric surgery. This abstract attempts to identify the key decision making steps in order to standardize care and be able to compare outcomes among programs.

**Methods:** A group of pediatric psychologists and surgeons involved in Stage 4 clinical and research activities came to consensus on key areas needing to be examined in order to consider escalation of therapy based on the literature and clinical case experience.

**Results:** Pattern of weight loss, behavior change, comorbid mental health and compliance to program standards were identified as important areas to assess.

**Conclusions:** The use of adolescent bariatric surgery is rising and many questions still remain in the standardization of protocols in adolescent programs. This abstract attempts to provide guidance, and a call for research, about when to escalate therapy for weight loss following adolescent bariatric surgery.

**A553**

**Alexis wound retractor in roux-en-Y gastric bypass: reducing surgical site infection associated with circular stapler use**

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Montefiore Medical Center<sup>1</sup>

**Introduction:** Surgical site infections (SSI) are the most common complication after laparoscopic roux-en-Y gastric bypass (RYGB), especially when a circular stapler is used. O-ring retractors have been shown to decrease rate of SSI for general surgical and colorectal procedures. We evaluated the rate of SSI before and after we began using the Alexis wound retractor (AWR) for RYGB.

**Methods:** Patients undergoing primary RYGB with circular stapler-constructed gastrojejunostomy were selected from operative logs at Montefiore Medical Center for two time periods: August 1 2016–July 31 2017 (PRE) and August 1 2018–present (POST). We will continue to collect data and include patients until July 31, 2019. AWR was used inconsistently through the 2018-2019 academic year. Time periods were selected to ensure all patients in PRE

cohort underwent RYGB without AWR and all patients in POST cohort underwent RYGB with AWR. Primary endpoints was superficial SSI. Operative time, length of stay (LOS) and 30-day morbidity and mortality were also assessed.

Results: A total of 177 patients underwent RYGB, including 105 in PRE cohort and 72 in POST cohort. Demographics were similar between groups. Six of the 105 (5.7%) PRE patients had superficial SSI. Thus far, one of the 72 patients (1.4%) in POST cohort have suffered superficial SSI. Operative time and LOS were similar.

Discussion: Use of the Alexis wound retractor significantly reduced the rate of superficial SSI for patients undergoing RYGB with circular stapler-constructed gastrojejunostomy. Utilization does not significantly increase OR time and can decrease morbidity and cost associated with SSI.

#### **A554**

##### **Bariatric Surgery Outcomes: Is Age Just a Number?**

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Indiana University Health North Hospital<sup>1</sup>

**Background:** The US population is aging. Obesity represents an increasing problem in all age groups. Bariatric surgery is one of the most effective long-term treatments for morbid obesity and its associated comorbidities. There is conflicting data regarding the effectiveness and safety of bariatric surgery in elderly patients. The aim of this study was to compare bariatric surgery outcomes in elderly patients with those of younger patients.

**Methods:** A retrospective analysis of patients who underwent bariatric surgery between 2011-2015 at our institution was performed. Patients were subdivided into five age groups:  $\leq 34$ , 35-44, 45-54, 55-64, and  $\geq 65$  years, and their mean percentage excess weight loss (%EWL), readmissions, and complications were compared.

**Results:** Five hundred eighty-seven patients were identified. Roux-en-Y gastric bypass was the most common procedure performed in all age groups. There was a trend towards a significantly lower starting BMI with increasing age (49.6 vs. 47.6 vs. 46.8 vs. 46.5 vs. 44.4  $p=0.07$ ) between the  $\leq 34$ , 35-44, 45-54, 55-64, and  $\geq 65$  years age groups, respectively. There was no significant difference in %EWL at 3 months, 1 year, 2 years, 3 years, and 4 years after surgery and 30d readmissions. Although not significant, the  $\geq 65$  years age group had the highest rate of 30d complications (See **Table 1**).

**Conclusion:** Bariatric surgery is relatively safe in the aging population with comparable weight loss results and readmissions. However, complication rates are expectedly higher than the younger population. Age alone should not be a deterrent for elderly patients from undergoing bariatric procedures.



## **A555**

### **Endoscopic plication of gastrojejunostomy and gastric pouch after gastric bypass for severe gastroesophageal reflux disease**

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Allegheny Health Network<sup>1</sup>

#### **Background:**

Roux-en-Y gastric bypass for patients with obesity has been the preferred procedure for patients with severe GERD (gastroesophageal reflux disease). However, some patients will still develop severe GERD postoperatively. We present our experience with endoscopic plication of the gastrojejunostomy and gastric pouch as a treatment for postoperative GERD in bypass patients.

#### **Methods:**

A total of 40 patients underwent endoscopic plication of their gastrojejunostomy and pouch for severe GERD from 2017 to 2019 using an endoscopic suturing device by a single surgeon at a single institution. Indications for surgery were verified based upon preoperative visit and operative note documentation.

#### **Results:**

A total of 32 female (80%) and 8 male (20%) patients with a mean age of 48.8 years old underwent endoscopic revision of their gastrojejunostomy and pouch for severe GERD after gastric bypass surgery. The average preoperative BMI (body mass index) was 39.9 kg/m<sup>2</sup>. Mean follow-up after their procedure was 2.85 months (n=36) with 4 patients lost to follow up. Regarding anti-reflux medication usage, the mean follow up was 3.1 months (n=36), and the average number of reflux medications per patient postoperatively was 0.76. No major complications were reported with this procedure.

#### **Conclusion:**

As the number of bariatric surgeries continues to increase, the issue of postoperative GERD after gastric bypass will become increasingly common. Endoscopic plication and revision of the gastrojejunostomy and pouch for postoperative GERD is a viable and safe alternative to laparoscopic surgical revision.

## **A556**

### **Psychiatric Illness in the Obese Veteran Population Does Not Impede Success of Laparoscopic Sleeve Gastrectomy**

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University of California, San Diego<sup>1</sup> UC San Diego<sup>2</sup>

#### **Objective:**

Assess efficacy of LSG in the Veteran patient with psychiatric conditions.

**Background:**

LSG has not been assessed in the VA bariatric population with concomitant psychiatric illness. 2.1 million veterans received mental health treatment from the U.S Department of Veteran Affairs from 2006-2010. Prevalence of mood disorders in bariatric patients is estimated at 23%. Psychiatric illness may be perceived as a barrier towards surgical success. We evaluate LSG outcomes in this patient subset.

**Methods:**

Retrospective analysis of VA LSG patients from 2009-2019 was performed. Primary outcome: %EWL and total body weight. Outcomes for preoperative psychiatric illness were compared to patients without psychiatric illness. Secondary outcomes: medication usage, lab values, mortality.

**Results:**

78 patients were identified. Median age  $54 \pm 10.5$  years, 78.8% male. Average follow-up  $48.1 \pm 24.2$  months. Psychiatric illness was reported in 46.8% at time of surgery. ASA Classification was 3 or higher in 82.8%. No significant difference noted in weight loss between patients with/without psychiatric illness. %EWL was 66% at 9 months. At 6 years, average % EWL was 37%. TBW reached a nadir at 1-year follow-up, average 216.2 pounds. There was a statistically significant decrease in use of insulin, anti-hypertensive medications, and statins at 2-years. Patients with DM2 had a decrease in hbA1c from 6.1 to 5.6 ( $p=0.0037$ ). Mortality and leak rate were 0%.

**Conclusions:** The VA bariatric population demonstrate improvement in health from LSG. Half the cohort had active psychiatric illness. VA patients with psychiatric disorders and obesity present a unique population that benefit from bariatric surgery.

**A557****Description and Implementation of a Novel Scale to Assess Readiness for Discharge after Bariatric Surgery**

Richard Seip *Glastonbury CT*<sup>1</sup>, Darren Tishler <sup>2</sup>, Pavlos Papasavas *Hartford CT*<sup>2</sup>, Tara McLaughlin *Hartford CT*<sup>2</sup>, Andrea Stone *Glastonbury CT*<sup>2</sup>, Witold Waberski *Hartford CT*<sup>2</sup>, Madison O'Brien <sup>2</sup>, Sally Strange *Hartford CT*<sup>2</sup>, Ifeoma Mogor *Hartford CT*<sup>2</sup>  
Hartford Hospital Metabolic and Bariatric Surgery Center<sup>1</sup> Hartford Hospital<sup>2</sup>

**Introduction:** The safe release of a patient from hospital care after bariatric surgery depends upon satisfactory health status. Here we describe a novel ordinal scale Readiness for Discharge (RFD) to measure the patient's suitability for hospital discharge after bariatric surgery.

**Methods:** Nursing staff monitored five RFD Scale components (ambulation, vital signs, pain, nausea, and oral intake of clear fluid; see Table) in 23 patients who underwent sleeve gastrectomy. Each component was scored as "1" (satisfactory) or "0" (not satisfactory) and scores were summed. RFD was recorded by nursing staff every 4-8 hours following surgery in

awake patients until a score of 5 was achieved (i.e., all items rated as satisfactory), marking the patient as ready for discharge.

Results: Individual patients: In some patients, recurring pain or nausea followed by treatment caused RFD oscillation. In others, RFD5 was recorded repeatedly over 12-16 hours, suggesting that RFD5 did not guarantee hospital discharge. Group observations: All patients achieved RFD5 prior to discharge. The median time from end of surgery to RFD5 was 27 [9-72] hours. Oral intake of 450ml liquid was the last factor to be judged satisfactory in more than 50% of patients. Other observations: Upon implementation, nursing staff quickly adopted the RFD and clinical team communications about patient status soon included RFD ratings.

Conclusion: The RFD Scale is a novel quantitative measure of the patient's readiness for release from the hospital following bariatric surgery. Validation is needed to support the adoption of the RFD on a wider scale.

## **A558**

### **Bariatric Surgery Access to Care was Improved Following Cost and Performance Analysis of Mechanical Staplers Between 3 USA Manufacturers**

Helmuth Billy *Ventura CA*

Ventura Advanced Surgical Associates

#### **Background**

Bariatric Surgery has become increasingly available in California via State funded government health plans. The challenge of providing bariatric surgery when hospital reimbursement is limited provided economic challenges for the viability of our bariatric program. We reviewed the current population and payer mix of primary and revisional bariatric operations done at our two ACS/MBSAQIP accredited centers over the 2017 and 2018 calendar year. We reviewed stapler cost per case of our currently available stapler vendors and compared to a third USA manufacturer which had recently obtained FDA approval for a comparable product.

#### **Results**

128 consecutive laparoscopic cases were performed using a previously unavailable stapler manufactured in the United States. All cases were performed by a single surgeon. The distribution of cases were 49 sleeve gastrectomies, 45 Roux Y Gastric Bypass, 3 colon-rectal and 31 revision operations. A total of 101, 45mm vascular cartridges were fired, 37, 60 mm vascular cartridges, 121, 45 mm medium thickness bowel cartridges, 131, 60 mm medium thickness bowel cartridges, 227, 60 mm regular thickness bowel cartridges and 60, 60 mm heavy thickness (black) cartridges were fired. A total of 677 staple cartridges were fired and assessed for performance and complications. There were no reoperations, leaks or staple line failures. Hemostatic clip use and staple line bleeding were similar between all three manufacturers. There was a significant difference in cost between manufacturer 3 and manufacturer 1 and 2.

#### **Conclusions**

State funded government health plans were no longer an economic liability to our program

## **A559**

### **Tolerance and observance of pre-operative very-low-calorie high-protein liquid diet before bariatric surgery.**

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Hôpitaux Universitaires de Genève<sup>1</sup>

#### Introduction

Benefits of a pre-operative low-calorie high protein diet before bariatric surgery has been described. Liquid diet has been described as achieving better feeling of satiety than solid diet. The American Society of Metabolic and Bariatric Surgery (ASMBS) stated that pre-operative nutritional care should be more investigated, especially behavioral parameters. This study aims to describe the tolerance and compliance associated with such diet.

#### Methods

A restrictive very-low-calorie high-protein 3-weeks liquid diet was implemented before bariatric procedures in a European university hospital. Bariatric unit database was searched for the following outcomes over a one year period: observance of the diet, number of days following the diet, psychologic difficulty to follow it, pre-operative excess weight-loss (EWL), changes in diabetic medication. Patients were their own controls.

#### Results

Ninety-two patients were included, 79.4% were women. Mean age was 45.8±11.1 years, and mean BMI before diet was 44.2kg/m<sup>2</sup>. Mean duration of diet observance was 16.5±7.5 days. Completeness was considered good in a large majority of patients (74.4%), although the diet was perceived as hard to impossible by most of the patients (56.1%). One third (32.1%) of diabetic patients were able to reduce or stop their diabetic medications under this diet. Good completeness group achieved a significantly higher percentage of EWL (5.3±2.5% vs. 3.7±2.5%, p= 0.009).

#### Conclusion

This highly restrictive pre-operative diet met a good observance, independently from the psychologic difficulty perceived by the patients. Results in terms of EWL and change in diabetic medication add validity to these findings.

## **A560**

### **Laparoscopic magnetic sphincter augmentation system for the treatment of severe GERD post Sleeve Gastrectomy**

Marcos Berry *Santiago*<sup>1</sup>, Lionel Urrutia<sup>2</sup>, Rodrigo Lynch<sup>3</sup>  
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## Introduction

The laparoscopic Magnetic Sphincter Augmentation System (MSA) is a surgical technique with mid-term evidence demonstrating efficacy in the treatment of medically refractory or chronic gastroesophageal reflux disease (GERD). We present the first series of cases with severe GERD post Sleeve, that underwent this surgery

## Objectives

To verify the efficacy of the MSA for the treatment of pathological GERD in patients with previous sleeve gastrectomy, with no weight regain.

## Methods

Since December 2018 , we selected 4 patients that had previous gastric sleeve and with normal weight. They

all had pathological GERD confirmed by preop studies, dependent on proton pump inhibitors.

Their preoperative study included a barium swallow, EGD, manometry and phmetry

## Results

The average age was 43 yo, all patients had a gastric sleeve with no weight regain. The studies highlighted the

presence of associated hiatal hernia up to 4 cm . They were submitted to a laparoscopic hiatal hernia repair

plus MSA using a magnetic ring. Average OR time was 90 min. LOS was 1 day. GERD resolved clinically from POD 1. No intra or

peri-operative complications. All left the proton pump inhibitors at 30 days postop.

## Conclusions

The MSA system have shown to be safe and effective treatment for GERD post Sleeve up to 3 months

FU. It appears to be a good surgical tool and an alternative to a RNY gastric bypass, especially for patients with GERD post Sleeve and no weight regain.

## A561

### **Bone loss following bariatric surgery: potential mechanisms, clinical relevance, and reducing fracture risk**

Lesley Scibora *St. Paul MN*

University of St. Thomas

Bariatric surgeries remain the most effective treatment for morbid obesity and obesity-related comorbidities<sup>1</sup>. Yet, despite substantial and durable weight loss and improvement in cardiometabolic profiles, an increasing body of evidence demonstrates that bariatric procedures exert a negative effect on bone density, microarchitecture, and strength, leading to an increased risk for fracture. Among the two most common bariatric procedures, sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB), studies have shown declines in hip bone density ranging

5% to 11% within the first post-operative year<sup>2</sup>. Further, one recent study showed that total hip bone density declined 9% at 24-months following RYGB and SG procedures, suggesting that bone loss may persist even after weight loss plateaus<sup>3</sup>. Several potential mechanisms may underpin this adverse skeletal effect, including diminished mechanical loading, alterations in body composition, nutrient deficiencies, and neurohormonal factors. This presentation provides an understanding of the skeletal effects of bariatric procedures and clinical relevance, the potential underlying mechanisms, and the effect of interventions to mitigate fracture risk.

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## **A562**

### **MAGNETIC GRASPER TECHNOLOGY FOR LAPAROSCOPIC GASTRIC SLEEVE SURGERY**

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#### **INTRODUCTION**

The present study evaluates an innovative solution through the use of magnetic devices that are coupled and mobilized by external magnetic fields through the abdominal wall.

#### **Objective**

To evaluate a new magnetic surgical system during reduced-port gastric sleeve surgery

#### **Method of its use or application**

This magnetic surgical system is an innovative technological platform that utilizes magnetic retraction designed to grasp and retract tissue and organs. It is composed by a grasper device with a detachable tip and a magnetic controller.

#### **Results**

We operated 23 patients, 16 women and 7 men. Age range between 17 and 62, with an average of 35,8 years old. The BMI range was between 30 and 38,3 with a media of 33,4 Kg/m<sup>2</sup>. All of them had comorbidities such as insulin resistance, dyslipidemia, arterial hypertension, hypothyroidism, arthralgia, non alcoholic fatty liver disease or obstructive sleep apnea. The mean operative time was 1:42 hours. All of them were fully performed by a reduced port technique. Reduced port means that we used 3 ports, when we generally need 4 or 5. Magnetic grasper was used to retract the stomach and the liver. Average stay of 2 days and no intraoperative or postoperative complications.

## Conclusions

This novel technology is safe. It allows a greater exposure in reduced port laparoscopic surgery. It is very easy to manipulate because its shape and function are equal to a regular grasper, and it can be utilized with a minimal learning curve.

## A563

### 6 cases follow up of Prader-Willi syndrome patients after bariatric surgery

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The First Affiliated Hospital of Jinan University<sup>1</sup>

**Background:** Prader-Willi syndrome is a well-known multi-systemic disorder featuring hypothalamic dysfunction and hypotonia with underlying chromosomal anomaly. The effect of long-term weight loss and the post-operative living quality are still rarely recorded.

**Methods:** Most patients are teenagers, we choose operation style according to the age, BMI and associated metabolic disease. After the operation, we ask for long-term follow up and their parents or other guardians should monitor their diets and weight. We also have recorded the weight change in the follow up.

**Results:** a 9-year-old female patient has accepted sleeve gastrectomy with BMI 38.1. Four cases from 16 years old to 20 have practiced gastric bypass and only one 32-year-old female patient has accepted biliopancreatic diversion-duodenal switch with BMI 40. In the follow up, we find evident weight loss in the first year. The EWL of them are over 30% in the first year, but one case gained weight than preoperatively in the second year without enough supervision. Two patients bounced back in the third year and who also can not be insisted on the diet for short of oversight. The other three patients have strict supervision who can stick to the diet and keep the EWL, one of them can keep EWL as 50.72% in the second year and 45.1%, 20.80% for the others.

**Conclusions:** Supervision is the key point for patients with PWS after bariatric surgery. Bariatric surgery has the best effect during the first year and all the patients should keep on follow up and family care.

## A564

### INSULIN THERAPY IN TYPE 2 DIABETIC PATIENTS 2 YEARS AFTER OF BARIATRIC SURGERY

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Montefiore Medical Center<sup>1</sup> Universidad de Chile<sup>2</sup>

**Introduction:** Bariatric surgery offers well-reported benefits to obese patients with type 2 Diabetes (DM2) achieving a lowering of the dose of medications and even the suspension of the medications. The aim of this study is to observe the maintenance of the use of insulin therapy in insulin-dependent patients undergoing bariatric surgery

**Methods:** Montefiore-MBSAQIP database for years 2014 - 2017 were used. Patients were included if they have type 2 diabetes under treatment with exogenous insulin and they underwent primary bariatric procedure. A retrospective chart review was conducted, we assessed diabetes therapy after 2 years of surgery.

**Results:** A total of 3475 patients underwent non-revisional bariatric surgery with 897 patients with previous diagnosis of DM2 (25.81%). 263 (29.3%) of the diabetic patients were in treatment with exogenous insulin previous to the surgery. The medium age of the insulin group was  $49.27 \pm 10.8$  with a medium BMI of  $46.11 \pm 8.38$ . Of this group 149 (56.7%) underwent a (LGB) and 114 (43,3%) a SG with a medium BMI of  $45,08 \pm 7,493$  for the LGB and  $47,46 \pm 9,265$  for the SG group ( $p < 0,022$ ). 154 patients complete follow up to 24 months, 104 (67,53%) without insulin and 50 (32,46%) with insulin.

**Conclusion:** Bariatric surgery is a good therapy for diabetic patients with insulin therapy, with a high rate of suspension of the insulin therapy. Further study is warranted to assess metabolic parameters and diabetes remission in this specific group of patients.

## A565

### **Behavioral adherence to bariatric recommendations among a predominantly Hispanic population of postoperative bariatric patients**

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Wyckoff Heights Medical Center<sup>1</sup> Wyckoff Heights Medical<sup>2</sup>

**Introduction:** Patient adherence to prescribed behavioral changes can result in positive weight loss and health outcomes following bariatric surgery. The purpose of this study was to analyze patients' self-reported adherence to twelve bariatric recommendations among an ethnically diverse sample.

**Methods:** A cross sectional design was used to collect data from 136 predominantly Hispanic patients between 6 to 24 months post-surgery in an outpatient community bariatric clinic. All patients received preoperative nutrition education and counseling by a registered dietitian and continued postoperative care with the dietitian and other bariatric providers. A questionnaire was developed to assess patient adherence by identifying the frequency with which patients followed the bariatric guidelines.

**Results:** Participants self-reported daily adherence to the following bariatric recommendations: starting a meal with protein (42.6%), consuming 3-5 servings of fruits and vegetables (27.2%), spacing meals every four hours (29.4%), taking 11-20 minutes to eat a meal (38.2%), avoiding eating and drinking at the same time (69.9%), ceasing eating when satiated (77.9%), and taking a vitamin supplement (76%). Most participants self-reported committing to the following



undesirable behaviors 0 to 2 times per week: drinking alcoholic beverages (91.2%), drinking sugar sweetened beverages (81.6%), eating salty snack foods (76.5%), and eating concentrated sweets (77.2%). One third of participants (35%) self-reported adequate exercise according to the recommended goal of 150 minutes of moderate to vigorous physical activity per week.

Conclusions: Counseling by a registered dietitian can improve adherence to postoperative nutrition and lifestyle recommendations and improve long-term bariatric clinical outcomes.

## **A566**

### **Bikini Line Sleeve Gastrectomy versus Standard Laparoscopic Sleeve Gastrectomy: 3 years outcome**

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Alexandria University

#### **BACKGROUND:**

The Standard Laparoscopic Sleeve Gastrectomy (SLSG) involves several upper abdominal incisions. The Bikini Line Sleeve Gastrectomy (BLSG) is a novel approach where ports are placed in the umbilicus and below the bikini line. We herein aim to compare the short and medium term outcomes of BLSG versus SLSG.

#### **METHODS:**

This is a case control study of 147 patients who underwent BLSG and age-, gender-, and BMI-matched controls of 182 patients who underwent SLSG. All procedures were performed by a single surgeon between January 2016 and January 2019. Patient demographics, perioperative data (length of stay, complications, mortality, and readmissions), and up to 3 year results (follow-up rate and weight loss) were studied.

#### **RESULTS:**

All 329 patients were females. Mean age & BMI were  $32 \pm 7.1$  years &  $38.9 \pm 4.1$  kg/m<sup>2</sup> for (BLSG) and  $33.6 \pm 8.9$  years &  $40.9 \pm 4.3$  kg/m<sup>2</sup> for (SLSG); ( $p > 0.05$ ). There were no mortalities. Bleeding occurred in three patients in SLSG and one patient in BLSG. One patient in SLSG had portal vein thrombosis. Follow up rate was 98.5% at three years. At six months follow up BLSG patients had a significantly higher %EWL than SLSG ( $61.3 \pm 22.8$  % vs  $48 \pm 15.2$ %; respectively,  $p = 0.02$ ). There were no significant difference between BLSG & SLSG as regards % EWL at later intervals ( 12 months=  $83.4 \pm 21.8$ % vs  $87 \pm 12$ %, 18 months=  $93.8 \pm 17.9$ % vs  $91.2 \pm 18$ %, 2 years=  $91.9 \pm 9.2$ % vs  $89.1 \pm 21$ %, 3 years=  $92.5 \pm 9.8$ % vs  $90.2 \pm 14$ %)

#### **CONCLUSION:**

BLSG was found to be potentially safe, feasible, and effective when compared to SLSG.

## A567

### **BASELINE PERSONALITY DIFFERENCES BETWEEN SLEEVE GASTRECTOMY AND GASTRIC BYPASS COHORTS AND THEIR ASSOCIATION WITH CONSECUTIVE FOLLOW-UP AFTER BARIATRIC SURGERY**

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The Ohio State Wexner Medical College<sup>1</sup> The Ohio State Wexner Medical Center<sup>2</sup> Icahn School of Medicine at Mount Sinai<sup>3</sup> The Ohio State University<sup>4</sup>

**INTRODUCTION:** We have previously shown that sleeve gastrectomy (SG) independently predicts both poor weight-loss and clinic-no-shows up to 2 years after bariatric surgery (BS). Given the association between follow-up and weight-loss, we hypothesized that baseline personality differences between SG versus gastric bypass (GB) may be contributory. Therefore, our aim was to compare personality traits between these cohorts and determine their association with consecutive post-operative follow-up.

**METHODS:** Primary BS patients from a single institution (N=323; nSG=187, nGB=136), with baseline MMPI2 clinical scale scores, were retrospectively reviewed from 2014-2016.

Personality traits, stratified using a T-score  $\geq 60$  (T60), representing  $\geq 85^{\text{th}}$  percentile, were used to determine differences between cohorts and an association with consecutive 24-month follow-up (FU-24). P-value  $<0.05$  was considered significant.

**RESULTS:** Analysis demonstrated significantly lower rates of FU-24, regardless of surgery type, in patients who scored  $<T60$  on the hypochondriasis scale (39.9% vs 61.8%,  $p=0.002$ ). Stratifying by surgery, a greater proportion of SG scored  $<T60$  on both hypochondriasis (low-H) and depression scales (32.1% vs 44.9%,  $p=0.02$ ; 52.4% vs 65.4%,  $p=0.02$ , respectively), but  $>T60$  on impulsivity (7.0% vs 2.2%,  $p=0.05$ ). Finally, SG patients were less likely to demonstrate consecutive FU-24 (45.7% vs 58.7%,  $p=0.01$ ). On multivariate analysis, low-H remained an independent predictor of poor FU-24 (OR 2.2,  $p=0.006$ ) after controlling for surgery type.

**CONCLUSIONS:** Poor FU-24 after BS is associated with both SG and low-H scores. Given that a greater proportion of SG had low-H scores, poor FU-24 and, by extension, poor weight-loss after SG may be predicted using the MMPI2.

## A568

### **Impact of Gastric Bypass and Sleeve Gastrectomy on metabolic control of Type II Diabetes**

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Authors – Neelima Bhargava MSN, RN; Alice Jackson RN CNOR NP-C CBN; Morgan McGrath, MAS; Riley Moore, MBA

Background – Type II Diabetes is a chronic, degenerative disease that develops when the body cannot make enough, or properly use, insulin – a hormone that helps regulate sugar (glucose) in the body. This study intends to examine the effectiveness of gastric bypass and sleeve gastrectomy on glycemic control in patients with diabetes.

Setting – Community Medical Centers, Fresno Heart and Surgical Hospital, Bariatrics & Medical Surgery Department

Method – A retrospective analysis of patient charts for patients suffering from obesity and diabetes, and a comparison of the improvement/resolution of diabetes and pharmaceutical treatment in this population post operatively, with post-operative follow up lasting up to five years.

Results – Of 319 patients undergoing a primary Roux-en-Y Gastric Bypass or Vertical Sleeve Gastrectomy procedure, 61.8% were found to no longer require pharmaceutical treatment for diabetes. By procedure, 65.1% of 229 Bypass patients and 53.3% of the 90 Sleeve patients no longer required pharmaceutical treatment. For patients with diabetes pre-operatively treated with insulin, 42.7% no longer required medication and 55.6% either needed no medication or non-insulin treatment. For insulin dependent patients 49.5% undergoing a Bypass and 24.2% of patients undergoing a sleeve no longer needed treatment (Absolute difference: 24.2, CI: (4.24, 41.3), p-value: 0.012). Among patients treated pre-operatively with non-insulin treatment, 75.4% Bypass patients and 70.2% Sleeve patients no longer needed treatment.

#### **A569**

**FREQUENCY OF CHOLELITHIASIS IN POSTOPERATIVE PATIENTS WITH VERTICAL SLEEVE GASTRECTOMY BARIATRIC SURGERY AT OBESITY AND BARIATRIC SURGERY CLINIC ON MARCH 2013 TO OCTOBER 2018 AT SANTO DOMINGO, DOMINICAN REPUBLIC. Blamilka Vargas, Soranyel Tejada, Dawny Guerrero, Cattaneo Ana, Diaz Morfa Luis, Domingo Ricardo.**

Ana Cattaneo *Santo Domingo*

COCIB Clinica Obesidad Y Cirugia Bariatr

Is well know that the fast weight loss can be a factor for cholelithiasis also with several big changes on meals intake that happens on people after sleeve gastrectomy surgery. An observational, descriptive, cross-sectional study with retrospective data collection was done, to determine frequency of cholelithiasis in postoperative patients with vertical sleeve gastrectomy. The universe was 317 patients to the total of patients who attended consultation for the first time during March 2013 - October 2018 at obesity and bariatric surgery clinic (COCIB), due to obesity, to opt for the performance of vertical sleeve gastrectomy, this patients met requirements to be in the age ranges between 18 and 70 years. It was evidenced that of 317 patients, 215 surgery was performed, corresponding to 67.8% of patients received on consultation, 75.81% did not present the pathology to be investigated. In addition to the total of these patients underwent surgery 7.44% underwent cholecystectomy concomitant with the bariatric surgery specified above; while 14.42% of the operated patients presented cholelithiasis after the procedure was performed. These patients who presented cholelithiasis were represented by women in 77% of total, while 23% of men. More than 60% of cases in women were between 21 to 40 years, also in the highest percentage of men were found in that age range, with age increase the presence of the pathology decrease. More information collected on this study will be used to analyze the correlation with certain meal patterns and cholelithiasis in Dominican patients.

**A570**

**Combined Magnetic Sphincter Augmentation and Hiatal Hernia Repair for Treatment of Refractory GERD after Sleeve Gastrectomy**

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**Introduction:**

Magnetic sphincter augmentation (MSA) has been shown to be a safe and effective surgical option in treating medically refractory GERD. However, there is limited data evaluating the efficacy of this technique in patients with previous laparoscopic sleeve gastrectomy (LSG) and concurrent hiatal hernia. We present a novel case of managing GERD with laparoscopic MSA and hiatal hernia repair after LSG.

**Methods:**

In September 2018, laparoscopic MSA and hiatal hernia repair was performed in a 58-year-old female with a DeMeester score of 51 who had undergone LSG 65 months prior. After repairing the hiatal hernia posteriorly, MSA was performed using a size 16 LINX® device. Patient demographic characteristics, operative details, and postoperative outcomes were collected and analyzed. Efficacy was evaluated using a previously validated GERD score questionnaire.

**Results:**

Laparoscopic MSA was well tolerated without complications and the patient was discharged home within 24 hours. The severity and frequency of the patient's reflux, regurgitation, epigastric pain, sensation of fullness, dysphagia, and cough symptoms were significantly improved postoperatively compared to preoperative evaluation with a reduction in the GERD score from 28 to 17.

**Conclusions:**

Magnetic sphincter augmentation is a safe and effective surgical option for addressing medically refractory GERD in patients with a previous LSG and concurrent hiatal hernia.

**A571**

**Oesophageal adenocarcinoma after conversion of sleeve gastrectomy to Roux-Y gastric bypass for gastroesophageal reflux. A case report.**

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Incidence of gastroesophageal reflux (GER) after sleeve gastrectomy (SG) is a concern considering the popularity of this procedure, lack of long-term data and theoretical risk of esophageal cancer development. Gastric bypass is considered the best therapeutic option for persisting reflux after SG. However up to 30% of patients suffer from post-operative GER.

We present the case of a 44 year-old women with a BMI of 40, type 2 diabetes and past history of smoking. Pre-op gastroscopy showed a 2 cm hiatal hernia, without oesophagitis or Barrett's oesophagus. In January 2015 she underwent SG and hiatal hernia repair. Her 2 years post SG %EBWL was 47.2% (BMI 32). Post-op SG barium study confirmed mild-to-severe reflux. Conversion to Roux-Y-gastric bypass with hiatal hernia repair was performed in February 2017. PPI therapy was continued postoperatively due to GER persistence. Two years post RYGB BMI is 28.8 (%EBWL 71.4). Finally, an incidental oesophageal adenocarcinoma was diagnosed endoscopically during an EGD performed for persistent GER symptoms in February 2019. EUS was compatible with mucosal disease and the CT and PET-CT were negative for metastatic disease. She underwent an uneventful endoscopic resection (EMR) with negative margins and the final report showed a 8mm well-differentiated adenocarcinoma (T1a) without lymphovascular invasion. She is currently followed with serial endoscopic follow-up every 3 months.

Persistent GER after bariatric surgery may increase the risk for esophageal adenocarcinoma even in the absence of Barrett's esophagus. It remains to be determined what endoscopic follow-up is warranted in this high risk group.

## **A572**

### **Conversion of Vertical Sleeve Gastrectomy to Duodenal Switch is a Reliable Option for Weight Recidivism with Minimal Risk of Vitamin Deficiencies**

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Background: The vertical sleeve gastrectomy (VSG) currently accounts for almost 60% of all bariatric surgeries in the US. Unfortunately, more than 50% of patients experience some degree of weight recidivism. The biliopancreatic diversion with duodenal switch (BPD-DS) is a highly malabsorptive procedure with better long-term weight loss. It isn't clear if patients have greater vitamin deficiencies.

Methods: 18 patients underwent elective laparoscopic revisions of VSG to BPD-DS. Electronic health records were reviewed retrospectively. Postoperative nutrition labs were performed that included vitamin A, D, E, K, thiamine, folate, B12, ferritin, PTH, copper, zinc and selenium levels. Weight and comorbidity data were also collected.

Results: No mortalities were seen. One patient experienced an upper gastrointestinal bleed that was managed non-operatively. Mean initial BMI was 45.78 kg/m<sup>2</sup>. Mean BMI change was 9.1 kg/m<sup>2</sup> at 6 months and 13.2 kg/m<sup>2</sup> at one year. Mean excess weight loss was 68% at one year. Follow-up varied between 6 and 36 months. Mean albumin levels at 12 months were 3.8 g/dL and 3.5 at 18 months. Four patients had vitamin D deficiencies and one patient had vitamin A deficiency at 1 year. Iron deficiencies were seen in 5 patients at one year postoperatively.

Conclusions: Conversion of VSG to BPD-DS is a reliable option to treat patients with obesity. Complications were minimal. Vitamin deficiencies were mild and treated with oral supplements. Thorough preoperative education along with intensive nutritional and psychological counseling will be crucial to ensure success.

### **A573**

#### **“A Prospective Randomized Trial of Liposomal Versus Plain Bupivacaine in Minimally Invasive General Surgery Procedures”**

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Naval Medical Center San Diego

Background: The opiate crisis in America has prompted institutions nationwide to explore different modalities to reduce opiate use. Bariatric surgery patients are especially at risk. Long-acting liposomal local anesthetic is one of those modalities, and this medication can easily be utilized in surgical patients to reduce postoperative incisional pain.

Objective: To compare the postoperative outcomes after surgical local infiltration with short-acting plain bupivacaine compared to long-acting liposomal bupivacaine in patients undergoing minimally invasive, general surgery procedures.

Methods: A prospective, double-blind, randomized controlled trial of patients undergoing minimally-invasive, elective bariatric surgery procedures. Subjects were randomized to receive either local infiltration of short-acting plain bupivacaine or long-acting liposomal bupivacaine during their procedure. Subsequent inpatient narcotic usage, was calculated and converted to oral morphine equivalents. Inpatient subjective pain scores were calculated and averaged throughout each patient's hospitalization. Outpatient pain levels and physical functioning levels were evaluated with the PASTOR pain scale survey at post-operative day 1, 7, and 14.

Results: This study is currently underway and is actively enrolling participants. As of April 2019, we have our first cohort of 60 patients completely enrolled with an additional 40 patients approved (currently enrolling). We anticipate completion of data collection by Sept 2019 with analysis available for presentation at Obesity Week 2019.

### **A574**

#### **Post Bariatric Surgery Thromboprophylaxis Therapy for Adolescent Patients: A Systematic Review**

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The Brooklyn Hospital Center<sup>1</sup>

**Background:** There is an appreciable variability in approaches for thromboprophylaxis among bariatric surgeons. Current ASMBS guidelines recommend mechanical prophylaxis and early ambulation. Additional chemical prophylaxis with low-molecular weight heparin or unfractionated heparin may be prescribed by the bariatric surgeon. The incidence of venous thromboembolism (VTE) 90 days post bariatric surgery is 0.42%. Most post discharge VTE events occur within the first 30 days after discharge. There is no consensus regarding extended anticoagulation prophylaxis for adolescents. The aim of this study is to review the literature investigating post bariatric surgery thromboprophylaxis in adolescents.

**Methods:** MEDLINE/PubMed was systematically searched for articles on thromboprophylaxis, post bariatric surgery, and adolescent patients.

**Results:** Of the 17 references identified by the search, four studies involved anticoagulation therapy for adolescents with obesity. A pilot study provided recommendations regarding enoxaparin use as thromboprophylaxis post bariatric surgery in adolescent patients. There is one ongoing clinical trial regarding prophylactic use of enoxaparin in adolescents with morbid obesity during bariatric surgery. Medication compliance is an issue with adolescents, therefore oral anticoagulation may be preferential in this population. All of the currently approved direct oral anticoagulants (DOACs) have ongoing pediatric developments. The pharmacokinetics of the DOAC rivaroxaban is not affected by high weight or bariatric surgery. Therefore, it does not appear that rivaroxaban dosing needs to be adjusted in these patient populations.

**Conclusion:** Further studies are needed to validate that oral anticoagulation therapy will have a higher compliance rate with similar safety and efficacy outcomes.

## A575

### **Impact of the ASMBS Essentials of Bariatric & Metabolic Surgery App as a Multidisciplinary Online Educational Curriculum**

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Beth Israel Deaconess Medical Center<sup>1</sup> Brody School of Medicine<sup>2</sup> ASMBS<sup>3</sup> Cleveland Clinic Weston, Florida.<sup>4</sup>

**Background:** One tenet for providing quality patient care is that all members of the care team have a shared mental model. The ASMBS introduced the Essentials of Bariatric & Metabolic Surgery App in 2016 to provide a source for multidisciplinary education on the perioperative care of bariatric surgery patients. The app includes a pre and posttest, six modules, and option for CME/CEU credits. Three years later, we anonymously surveyed registered users via Survey Monkey<sup>®</sup> to determine the utilization and impact of the app. The survey obtained formal IRB exemption.

**Results:** Over 3000 learners have registered: anesthesiologists (N=80), anesthesiologists (N=19), integrated health (N=1051), NP/PA (N=361), other physicians (N=384), surgeons (N=1508). A

survey link was emailed three times in May 2019; 85 responses have been collected to date. Overall, respondents were satisfied with the ease of use of the app. 62% reported increased knowledge or skills; 33% made a change in performance. 79% of respondents recommended completion of the Essentials App for the Certified Bariatric Nurse (CBN) certificate, while only 46% favored completion for ASMBS Fellowship certification. Only 2% of registrants chose to purchase CME or CEU credits, but 84% favored expanding Essentials to provide a greater number of credits.

Conclusions: While the majority of respondents were satisfied with the new educational tool, they identified several areas with need for new or additional content. As ERAS and other best practices emerge for the care of the patient with obesity, the Essentials App will need future revisions to stay relevant.

#### **A576**

##### **Portomesenteric Vein Thrombosis after Laparoscopic Sleeve Gastrectomy**

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Nini Hospital

Background: Laparoscopic sleeve gastrectomy (LSG) is today the most performed bariatric procedures in the world, and porto-mesenteric vein thrombosis (PMVT) has been reported as one of the rare complications of LSG. The purpose of our work is to present the prevalence, clinical presentation, and outcomes of PMVT in patients undergoing LSG in our service. Methods: We examined retrospectively all the clinical records of patients who underwent LSG for morbid obesity from 2010 to 2018, performed at Nini Hospital, Tripoli - Lebanon, by the same surgeon. Results: A total of 1104 patients underwent LSG during the study period. 4 (0.4%) patients were diagnosed with PMVT post-LSG. Diagnosis was confirmed by CT scan for all the patients. The median age was 38 years (31–48). 3 patients were males. Median preoperative body mass index (BMI) was 48 kg/m<sup>2</sup> (43 - 54), and median operative time was 35 min (30 - 42). The median post-operative anticoagulation duration was 3 days (0–10). The onset of symptoms was 4-10 post-operatively and diagnosis was at 7-14 days. All patients had a negative thrombophilia study and they were treated medically by IV Heparin for an average of 7 days and then shifted to oral anticoagulation for six months. Conclusions: Incidence of PMVT is low after LSG. Mild to moderate abdominal pain, vomiting and dehydration are the most common presenting symptoms with diagnosis confirmed by computed tomography

#### **A577**

##### **SHORT TERM ORAL ANTICOAGULATION MAY PREVENT PORTO-MESENTERIC VEIN THROMBOSIS AFTER SLEEVE GASTRECTOMY**

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Background: Porto-mesenteric vein thrombosis (PMVT) has been increasingly reported after sleeve gastrectomy. Few publications have described high incidence of thrombophilia associated with obesity.

Objectives: We report on the outcomes of short time oral anticoagulation with apixaban, in patients with recognized abnormality on a preoperatively obtained thrombophilia panel.

Methods: From April 2018 to April 2019, preoperative thrombophilia panels were obtained in 220 patients undergoing sleeve gastrectomy . Patients were predominantly female (81.8%) and Hispanic. Average age and BMI were 38 (19-66) and 44 (34-83) respectively. Overall 72.7% had an abnormal thrombophilia panel (n=160). Abnormal factor VIII level encompassed 90% of these (n=144), APC resistance 6.9% (n=11), protein S 1.9% (n=3), and protein C 1.2% (n=2). Patients with factor VIII level of more than 200 IU/DL or any other abnormality were treated with apixaban for one month.

Results: One patient developed left portal vein thrombosis. Her factor VIII activity was 169 IU/DL. During the observed period, no major bleeding requiring transfusions or surgical intervention occurred. Two patients developed hematuria one of which required discontinuation of therapy. Two patients reported menorrhagia and one patient had a nosebleed not requiring cessation of therapy. Compliance with the treatment at one-month follow-up was approximately 96%.

Conclusion: Our preliminary data indicate, that use of short term apixaban is safe and well tolerated with a high compliance rate. We suggest utilizing this strategy for preventing PMVT in any patient with abnormal thrombophilia result.

## **A578**

### **MICRONUTRIENT DEFICIENCIES FOLLOWING BARIATRIC SURGERY IN A PREDOMINANTLY BLACK POPULATION**

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#### Introduction

Patients undergoing bariatric surgery are at increased risk for developing nutritional deficiencies. The aim of this study was to determine the incidence and prevalence of these nutritional deficiencies among a predominantly Black population undergoing bariatric surgery.

#### Methods

Retrospective chart review of bariatric surgery patients at a single urban academic institution (2008-2017) was performed. Subjects underwent laparoscopic Roux-en-Y gastric bypass (LRYGB) or laparoscopic sleeve gastrectomy (LSG). Using laboratory data (Serum Iron, Vitamin B12, Folate, Calcium, Vitamin D, Albumin, Prealbumin and Hemoglobin), patients with pre-operative and 6-month post-operative micronutrient deficiency were determined.

#### Results

Of the 517 patients, 69% had LRYGB and 31% had LSG. Most were Black (91%) and female (82%), with a mean age of 43 years and mean preoperative BMI of 48 kg/m<sup>2</sup>. At baseline, 53% of the population presented with at least one deficiency. Of those, 60% still had a micronutrient deficiency at 6 months. Among those who were non-deficient at baseline, 48% developed a deficiency by 6 months. The most common preoperative deficiency was vitamin D (69%). Deficiencies at 6 months were more common among patients less than 50 years (56% vs. 35%,  $P=0.023$ ). Patients with LRYGB had more 6-month deficiencies than LSG if they were deficient at baseline (66% vs 45%,  $P=0.019$ ) but not if they had no baseline deficiencies (52% vs 35%,  $P=0.096$ ).

### Conclusion

Despite routine micronutrient supplementation, nutritional deficiencies are common after bariatric surgery. New strategies that improve the success of nutritional supplementation may be beneficial in preventing nutritional deficiencies among these patients.

### A579

#### **Investigating weight-related outcomes following Laparoscopic Sleeve Gastrectomy utilizing the ACS MBSAQIP**

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### Background

Laparoscopic gastric sleeve banding is well-documented as capable of significant and sustained weight loss. We present a query of national bariatric surgery data investigating potential differences in surgical outcomes of laparoscopic sleeve gastrectomy (LSG) by obesity class.

### Methods

Patients were identified from the 2016 American College of Surgeons Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (ACS-MBSAQIP). Laparoscopic sleeve gastrectomy was identified based on the Current Procedure Terminology (CPT) code 43775. Patients were subdivided according to the Centers for Disease Control and Prevention obesity classifications including underweight (BMI<18.5), normal weight (BMI 18.5-25), overweight (BMI 25-30), and obese classes 1-3 (BMI >30). Post-operative outcomes were compared between BMI groups with T test and chi squared analysis.

### Results

338,061 patients (underweight n=8; normal n=58; overweight n=413; obese n=335,130) were identified. Normal weighted patients were statistically more likely to demonstrate gastroesophageal reflux disease and experienced concomitantly longer surgical procedures ( $p<.05$ ). Staple line reinforcement appeared to be utilized more frequently by surgeons operating on obese patients. Little meaningful difference was appreciated among postoperative complication rates by patient BMI, however increased unplanned ICU admission, hospital readmission, reoperation, and death were observed among normal weight patients.

## Conclusions

Our findings represent novel investigation of 2016 ACS MBSAQIP database for laparoscopic sleeve gastrectomy outcomes by patient weight class. Surprisingly, it would appear greater concern should be paid to normal weight patients undergoing laparoscopic sleeve gastrectomy as they demonstrate more complex postoperative courses. Bariatric surgeons should include this information in preoperative candidate selection and counseling for weight-sparing surgery.

## A580

### **Sagittal Abdominal Diameter in Adolescents: Association with Metabolic Syndrome Severity and Effects of Weight Loss Surgery**

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**Background:** Metabolic syndrome (MetS) affects 10% of adolescents and is associated with development of diabetes and heart disease. Abdominal obesity, representing excess visceral fat, is the most prevalent component of MetS. Sagittal abdominal diameter (SAD) is highly correlated with visceral fat, yet its use in the clinical setting is largely nonexistent. We aimed to determine MetS prevalence and association between MetS severity and SAD in adolescents undergoing bariatric surgery.

**Methods:** We examined data from Teen Longitudinal Assessment of Bariatric Surgery (Teen LABS) study participants through 5 years post-bariatric surgery. MetS prevalence was defined using standard criteria and MetS severity using the MetS z-score (Met-z). The association between SAD and Met-z was evaluated using a linear mixed model, adjusting for covariates including sex and age at surgery.

**Results:** Among 228 individuals, mean age 16.5y and BMI 53 kg/m<sup>2</sup> at baseline (75% female, 72% white), 65% met criteria for MetS. Mean pre-surgery Met-z was +1.5 and SAD was 32cm. Both significantly declined by 1 year, to Met-z of -0.02 and SAD 23cm. At 5 years after surgery, Met-z was +0.15 and SAD 25cm, (both  $p < 0.0001$  compared to baseline). Met-z and SAD were highly correlated at all timepoints ( $r = 0.72$  overall,  $p < 0.0001$ ).

**Conclusions:** Adolescents undergoing bariatric surgery have a high MetS prevalence. Major reductions in MetS and SAD were observed out to 5 years post-surgery and these two measures were consistently highly correlated over time. SAD may be a valuable tool to predict MetS in youth with obesity.

## A581

### **Pneumoperitoneum is not an Expected Finding After Laparoscopic Sleeve Gastrectomy**

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#### Introduction:

Despite its well-known association with technical problems and perforated viscus, pneumoperitoneum on imaging is frequently considered a benign finding in the early post-operative period, being ascribed to insufflation, rather than a more ominous etiology. This study argues that the true incidence of pneumoperitoneum following laparoscopic sleeve gastrectomy is actually very low, and therefore its presence should warrant significant concern in the proper clinical context.

#### Methods:

This study spans a five year period, from 2013 - 2017, in which upper GI series were performed routinely after all laparoscopic sleeve gastrectomies. Inclusion criteria included all adult patients undergoing this operation who had post-operative day one imaging. Exclusion criteria were revisional operations, or operations that included additional procedures. Radiology reports were retrospectively queried for the terms: "pneumoperitoneum," "air," and "free air." Positive results were reviewed to ensure accuracy and determine outcomes. The incidence of positive findings was calculated as a percentage of the total number of studies performed.

#### Results:

Of 1,760 laparoscopic sleeve gastrectomies performed in the study time period, three patients had definite pneumoperitoneum (0.17%), and four had equivocal findings (0.23%), for a maximum possible incidence of 0.4%. All patients with non-negative findings had a benign hospital course and no complications.

#### Conclusion:

Although pneumoperitoneum can be a benign finding in the early post-operative period after laparoscopic sleeve gastrectomy, this finding should raise concern, especially in the appropriate clinical context. The incidence of pneumoperitoneum was found to be very low (0.17 - 0.4%) and should not be considered a routine finding.

## A582

### **Efficiency of laparoscopic one-step revision of failed adjusted gastric banding to gastric sleeve: a retrospective review of 101 consecutive patients**

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**Background:** In recent years, laparoscopic adjustable gastric banding (LAGB) has been one of the most common performed bariatric procedures worldwide. Nevertheless, its high rate of complications and failure up to 70% demands a revisional surgery. The one-stage conversion LAGB to laparoscopic sleeve gastrectomy (LSG) has been proved to be safe, but concern on efficacy on long-term weight loss has been raised.

**Objectives:** To present our long-term outcomes on this procedure.

**Methods:** We retrospectively reviewed the charts of 133 revisional LSG for failed or complicated LAGB from January 2010 to August 2017. 32 patients were excluded for lost

follow-up. Demographics, complications and percentage of excess weight loss (EWL%) were determined.

**Results:** One hundred and one patient were included (85 women and 16 men) with mean age of 48.5 years and mean body mass index of 47.1 kg/m<sup>2</sup>. During the follow-up, 15 patients (15%) underwent a revisional surgery for weight loss failure (8 Roux-en-Y gastric bypass, 3 biliopancreatic diversion, 3 single anastomosis duodeno-ileal bypass, 1 revisional LSG). Ten patients (10%) had long-term complications (8 severe reflux and 2 stenosis) during this period and underwent a revisional surgery (10 RYGBP). Postoperative complications included 1 gastric leak, 2 early gastric hematomas and 2 incisional hernias, without requiring a surgery. The remaining 76 patients had a mean follow-up of 4.3 years with an EWL of 53.2%.

**Conclusion:** Our long-term results confirm that the single-stage conversion to LSG is a safe and good solution for failed or complicated LAGB with good long-term weight loss.

### A583

#### **Does Sequential Procedureless Gastric Balloon Treatment Augment Weight Loss: Safety and Efficacy in 30 with Obesity or Overweight**

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**Background:** Several studies have demonstrated the safety and efficacy of the Elipse™ procedureless gastric balloon for weight loss. If additional weight loss is indicated, sequential Elipse Balloon treatments may be an attractive modality.

**Objectives:** The aim of this study is to evaluate safety and efficacy of sequential Elipse™ Balloon treatment in patients with obesity or overweight.

**Methods:** Elipse™ was swallowed and filled with 550ml of liquid during an outpatient visit. Approximately 1 month following the excretion of the first Elipse™ Balloon, a second balloon was placed. Nutritional follow up was performed. Data was collected on weight-loss (WL)(kg), BMI Loss (BMIL)(kg/m<sup>2</sup>), percentage total body weight loss (%TBWL), percentage excess weight-loss (%EWL) and complications.

**Results:** Retrospective review of records from 6 international obesity centers from November 2016 to November 2018 identified 30 (8M/22F) patients who had undergone sequential Elipse™ Balloon treatments. Mean age, weight and BMI were 39.7±10.9 yrs, 101.3±27 kg and 37.4±11.3 kg/m<sup>2</sup> respectively. After 4 months, mean WL, %TBWL, BMIL and %EWL were 13.4±6.2 kg, 12.7±3.8, 5±2.5 and 47.4±18.8 respectively. At the time of the second balloon placement, mean weight was 88.2±12.5 and mean BMI was 31.2±4.8 kg/m<sup>2</sup>. Sequential second balloon placement resulted in additional WL, BMIL, %TBWL and %EWL. These results were 7.3±5.0kg, 2.6±2.0, 8.2±5.4% and 79.9±81.6% respectively. There were no complications. One patient had a planned endoscopic balloon removal for history of appendicitis.

**Conclusions:** Sequential Elipse™ balloon treatment is safe and effective if additional weight reduction is indicated following the passage of the first Elipse balloon.

#### **A584**

##### **Relevance and Reliability of a Validated Intraoperative Bleeding Scale (VIBe SCALE) for General and Bariatric Surgery**

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Bleeding complications after gastric bypass can occur from staple lines, iatrogenic visceral injury or mesenteric vessels; 43% of bleeding complications require operative intervention. Bleeding, therefore, must be recognized and treated intraoperatively.

This study investigates the relevance and reliability of using a Validated Intraoperative Bleeding Scale (VIBe SCALE) to assess intraoperative bleeding by general and bariatric surgeons.

Surgeons who self-trained on the VIBe SCALE (Table 1) graded bleeding on videos with known bleeding rates. A Kendall's W was calculated for inter-observer agreement (reproducibility) using ten unique videos and intra-observer agreement (repeatability) using five duplicate videos. Surgeons were then asked questions about the scale's usability, clarity and relevance.

Twenty-one surgeons board certified in general surgery participated. Mean years of experience was 17.2 (Range: 4-28, N=21) with an average of 65±25.6% minimally invasive caseload. All surgeons reported using hemostatic agents in their practice.

Inter- and intra-observer agreement was "excellent" with values of 0.93 and 0.98, respectively. All surgeons agreed the scale is relevant for evaluating hemostasis, and it represented the sizes and severities expected in clinical practice. A majority agreed the scale has objective terms (18/21, 85.7%) that are non-overlapping (17/21, 81.0%). Visual presentation of the bleed was the most common descriptor (100%) and was the most relevant (16/21, 76.2%) to assign bleeding grades.

Surgeons can grade bleeding using the VIBe SCALE with excellent reliability. Use of the VIBe SCALE may improve early recognition and expedite treatment of bleeding. The VIBe SCALE may also create a common language to describe intraoperative bleeding.

#### **A585**

##### **Iron and Related Nutritional Deficiencies Among Asians 1 Year Post Sleeve Gastrectomy**

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National University Health System<sup>1</sup> Yong Loo Lin School of Medicine<sup>2</sup>

## **Introduction**

Laparoscopic sleeve gastrectomy (LSG) is an effective treatment for obesity. Pre and post bariatric surgery nutrient deficiencies exist commonly. Literature on this is scant in Asian populations.

## **Aim**

Our study aims to identify predictors for baseline anemia in an Asian bariatric population and compare anemia and related nutrient deficiencies at baseline and 1-year post LSG.

## **Methods**

Retrospective analysis of 127 patients undergoing LSG at a tertiary institution in Singapore between 2012 & 2018 was conducted. Patient demographics, hemoglobin, iron indices, vitamin B12 and folate levels were compared pre- and 1 year post-operatively. Analysis was also done to identify factors predicting for baseline anemia.

## **Results**

There were 79 females and 48 males. The mean age was 44.5 ( $\pm 11.5$ ) years with a mean pre-op BMI of 41.6 ( $\pm 6.7$ ) kg/m<sup>2</sup>. Females, age > 50, class I obesity were significant predictors for baseline anemia. Table 1 compares anemia and nutrient deficiencies at baseline and 1 year post-operatively. Iron deficiency was the most prevalent nutrient deficiency in patients with anemia. Post operatively the percentage patient with hemoglobin below 13g/dL increased significantly while percentage patients with deficiency in iron & B12 decreased. Table 2 shows a comparison of nutrient deficiencies in patients with anemia at baseline and 1 year post-operatively.

## **Conclusion**

Patient aged over 50 years and females require more attention to supplement intake following bariatric surgery. Also, in the short-term iron and B12 deficiencies is seen to decrease.

## **A586**

### **Propensity Matched Comparison of Robotic and Laparoscopic Bariatric Surgery: Are we still in a learning curve or can we agree Robotic bariatric surgery is associated with longer operative times?**

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Background: Robotic-assisted GI surgery has been uniformly associated with longer operative times. Previous studies report the bariatric learning curve as approximately 30 cases. The objective of this study was to compare operative times for the 3 available years of the MBSAQIP database to validate a learning curve toward shorter operative times.

Methods: Robotic(RA) and Laparoscopic(L) Sleeve gastrectomy(SG) and Gastric

Bypass(RYGB) were compared using the 2015, 2016 and 2017 MBSAQIP PUFs. Patients were propensity matched based on age, gender, body mass index and assistant. A total of 62,082 patients were included (Robotic SG n=22,015, Laparoscopic SG n=22,015, Robotic RYGB n=9,026, Laparoscopic RYGB n=9,026)

Results: Median operative times were significantly longer for both RASG (63 vs 87 minutes;  $p < .001$ ) and RARYGB (140 vs 105 minutes;  $p < 0.001$ ) compared to laparoscopic approach. Operative times from 2015-17 significantly decreased in **both** RASG (93, 89, 87 minutes;  $p < .001$ ) and LSG (66, 63, 61 minutes;  $p < .001$ ). RARYGB had a significant increase in operative time (137, 139, 144 minutes;  $p < 0.001$ ) with no significant change in operative time for LRYGB. RASG and RARYGB patients were more likely to be readmitted ( $p = 0.01$  for both). RASG patients were also more likely to require a reintervention ( $p = 0.03$ ). Morbidity and mortality were similar for all groups.

Conclusions: Operative times remained 30% longer for RASG and increased each year for RARYGB compared to laparoscopic approaches. No evidence of a year-to-year learning curve toward shorter operative times or improved outcomes was identified in the MBSAQIP PUF files published to date.

#### **A587**

#### **Comparison of Laparoscopic Roux-en-Y Gastric Bypass and Sleeve Gastrectomy from 2015-2017: An MBSAQIP Analysis**

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Background: Over the last decade, laparoscopic sleeve gastrectomy (SG) has surpassed Roux-en-Y Gastric Bypass (RYGB) in popularity. Previous studies have suggested lower rates of complications in SG; however, there are limited large-scale studies.

Methods: The 2015-2017 MBSAQIP Participant Use File was used to assess early postoperative differences between laparoscopic RYGB and SG in adults. Descriptive statistics, independent t-tests, and chi-squared tests were used to describe the sample. Multivariable logistic regression was used to assess 30-day outcomes.

Results: 467,444 cases met inclusion criteria. Patients who underwent RYGB were older ( $45.6 \pm 11.8$  years vs.  $44.5 \pm 12$  years,  $p < 0.001$ ), more likely to be white ( $n = 99,609$ , 75.3%  $p < 0.001$ ), female ( $n = 106,943$ , 80.9%  $p < 0.001$ ), and had higher body mass indexes ( $45.7 \pm 8.2$  kg/m<sup>2</sup>  $p < 0.001$ ) and higher rates of most comorbidities ( $p < 0.001$ ). The majority of the growth in surgical volume over the three years was attributed to increases in SG ( $p < 0.001$ ). Across all three years, readmission, reoperation, intervention, and mortality odds ratios were all smaller in SG patients ( $p < 0.001$ ). SG patients had lower odds of the three most common reasons for readmission, reoperation, and intervention ( $p < 0.001$ ).



Conclusions: The rates of readmission, reoperation, intervention, and mortality in RYGB and SG have declined from 2015 to 2017, specifically in SG. Outcomes suggest SG is lower in risk profile and becoming increasingly popular over RYGB.

#### **A588**

##### **Is Bariatric Surgery Becoming Safer? Assessing MBSAQIP Data Over a Three-Year Time Period**

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Background: Bariatric surgery is an underutilized treatment option for severe obesity in the United States. An estimated 228,000 bariatric procedures were performed in 2017, representing a progressive increase since 2011. However, little large-scale data exists in the literature to determine whether bariatric surgery is becoming safer over time.

Methods: We used the MBSAQIP Participant Use File to compare early postoperative data from 2015 to 2017 of adults who underwent laparoscopic Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG). Descriptive statistics, independent t-tests, and chi-squared tests were used to describe the sample. Multivariable logistic regression was used to assess 30-day outcomes.

Results: Within the three-year time period, 467,444 cases met inclusion criteria. The volume of laparoscopic RYGB and SG procedures increased 21% from 2015 to 2017, which was predominantly due to increases in SG (28,999 increase over the three-year period vs. RYGB 2,152 volume increase;  $p < 0.001$ ). Over the three years, the rates of complications requiring readmission, reoperation, and intervention decreased significantly ( $p < 0.01$ ). Despite a yearly trend toward decreasing odds ratios, the reduction in mortality rate did not reach statistical significance ( $p = 0.09$ ).

Conclusions: In accordance with increased adoption of laparoscopic bariatric procedures from 2015 to 2017, there has been a significant decrease in the rates of complications necessitating readmission, reoperation, or intervention following RYGB and SG; the low mortality rate has remained stable with a trend towards improvement as well.

#### **A589**

##### **Risk Factors For Readmission For Hyperparathyroidism After Bariatric Surgery**

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**BACKGROUND:** Bariatric surgery leads to many nutritional deficiencies, specifically with calcium absorption and has long-term impacts on bone density. Previous studies explore hyperparathyroidism after Roux-en-Y gastric bypass (RYGB) but there are no studies looking at readmission rates for hyperparathyroidism in patients after either RYGB or sleeve gastrectomy (SG). We sought to assess the frequency of readmission and related comorbidities in this patient population.

**METHODS:** The Nationwide Readmission Database (NRD) from 2010 to 2015 was queried for all patients who had previously undergone bariatric surgery with a readmission diagnosis of hyperparathyroidism. Multivariate logistic regression was used to determine the odds ratios for the outcomes of interest.

**RESULTS:** There were 915,792 patients who had bariatric surgery. 395,938 (43.2%) had undergone a SG with the remaining having RYGB. In total, 589 bariatric surgery patients were readmitted for hyperparathyroidism. The majority were female (80.8%) and had a CCI  $\geq 2$  (68%).

Multivariate regression revealed that patients between the age of 45-64 (OR 1.42,  $p=0.001$ ) and those with Medicare (OR 3.01,  $p<0.001$ ) or Medicaid (OR 2.61,  $p<0.001$ ) were more likely to be readmitted after bariatric surgery for hyperparathyroidism.

Comorbidities associated with the highest ORs for readmission with hyperparathyroidism were renal failure (OR 17.14,  $p<0.001$ ), hypertension (OR 2.89,  $p<0.001$ ), and deficiency anemias (OR 2.62,  $p<0.01$ ).

**CONCLUSIONS:** Readmission rates are frequently used as a quality metric for patient care. Efforts should be made to reduce readmission for patient groups at higher risk. Bariatric surgery patients with renal failure, hypertension, and anemias should have earlier follow-up with monitoring of calcium, vitamin D, and PTH levels.

## A590

### Initial Experience of a Single Institution Utilizing Anatomy-Based Sleeve Gastrectomy: A MBSAQIP Database Analysis

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Introduction: Laparoscopic sleeve gastrectomy (LSG) using the classic bougie (B) technique has produced highly variable and imperfect gastric pouches. This anatomic variability has been

implicated in early dysphagia, readmissions for nausea/vomiting, gastro-esophageal reflux disease (GERD), and inconsistent weight loss. The anatomy-based sleeve gastrectomy (ABS) was developed to reduce inconsistencies in gastric pouch creation. We present our institution's initial experience using this technique.

**Methods:** Retrospective cohort analysis was performed on prospectively collected MBSAQIP data from a single US center. One surgeon performed LSG on 665 patients: 523 patients received B technique, and 142 patients received ABS technique over a subsequent 1-year period. The ABS technique involved applying a clamp across the stomach connecting measured distances from the gastro-esophageal junction, incisura, and pylorus. Stapling then takes place adjacent to the clamp. Analysis was performed comparing data from both groups to evaluate 30-day complication rates, 6-months weight loss and comorbidities.

**Results:** Pre-operative characteristics were similar among groups. Operative time was longer in ABS group (69.4 vs 58.1 mins,  $p < 0.01$ ). 30-day readmission rates were statistically lower in ABS group (0.6% vs 3.8%,  $p < 0.04$ ). 30-day reoperation and complication rates were not statistically different between groups; there were no leaks or strictures noted. At 6 months (B=443 patients, ABS= 60 patients) no significant differences in GERD rates, comorbidity resolution rates and percentage total weight loss were found.

**Conclusion:** ABS technique is associated with a significantly lower readmission rate compared to LSG with B technique. More patient data including longer follow up period is needed

## **A591**

### **Remission of Gout after Bariatric Surgery: A short term analysis**

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Cleveland Clinic Florida<sup>1</sup>

### **Background**

Gout is an inflammatory joint condition caused by accumulation of urate crystals, secondary to elevated serum uric acid (UA). The prevalence of gout in obese patients has been reported to be 5-7%. We aim to analyze the impact of rapid weight loss on remission of gout.

### **Methods**

After IRB approval, a retrospective review was performed of all patients with BMI  $> 35 \text{ kg/m}^2$  from 2004 to 2018. Patients with gout prior to bariatric surgery (BS) were included in the study and those being treated with thiazides, low-dose Aspirin, and alcoholics were excluded. Three groups were identified: Adjustable Gastric Banding (AGB), Laparoscopic Sleeve Gastrectomy (LSG), and Roux-en-Y Gastric Bypass (RYGB). The groups were matched based on demographics and co-morbidities. Remission of gout was determined as normal range UA (3.5-6 mg/dl) and absence of flares at 12 and 24-months postoperatively.

### **Results**

From 4,226 patients, 1.7% (N=72) met inclusion criteria. Mean age was  $67 \pm 11$  y/o, most prevalent

ethnicity was Caucasian 79%(N=57), male gender 66.6%(N=48), mean BMI 43.5±6kg/m<sup>2</sup>, and 58.3%(N=42) patients had LSG followed by 31.9%(N=23)RYGB. Uric acid measurements(mg/dl) decreased from 8.3±2 to 6.4±1 at 12-months (p<0.001), and from 8.3±2.6 to 5.4±1 at 24-months(p<0.001) after BS. When analyzing weight-loss, the %EBMIL was 46.2±29.9 at 12-months and 66.9±47 at 24-months. The %TWL was 18.6±12 and 24.5±16.8 during the same period. Remission of Gout was observed in 36.6%(N=26; p=0.002) patients at 12-months follow-up and 59.7%(N=40; p<0.001) at 24-months follow-up.

### **Conclusion**

Our results suggest that weight-loss after BS correlates with an improvement of UA levels in the early postoperative period. UA measurements showed marked reduction in relation with higher %EBMIL and %TWL. Thereby, Gout remission can be achieved in 59.7% at 24-months after weight-loss procedure.

### **A592**

#### **A Century of Populist Weight Loss Ads**

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For well over a hundred years, people have attempted to lose weight through creative means, some of which are grounded in science, some a product of wild imagination. This presentation traces the history of weight loss and dieting fads since the late 1800s to the present through original print advertising. Weight loss approaches are placed in historical context and will reveal that in actuality, everything that is old is new again. The talk is designed to be both informative and entertaining, using a light hearted approach to share the lengths people have gone to in order to control their weight, and the suspension of disbelief required to subscribe to some rather outlandish approaches over time. Attendees will leave with a much better sense of the roots of modern weight loss strategies.

### **A593**

#### **ASSOCIATION BETWEEN HLA CLASS I ALLELES AND MORBID OBESITY**

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**Background and Aims:** Stimulation of adipose tissue and activation of immune cells are important component triggering obesity. We recently identified that certain Human Leukocyte Antigen (HLA) class II alleles (HLA-DRB1) were higher in morbidly obese patients. HLA class I, HLA-A, HLA-B and HLA-C loci were also shown to be related to some inflammatory diseases. The present study aims to analyze the association of HLA-A, HLA-B and HLA-C

alleles with morbid obesity.

**Methods:** HLA alleles frequency was investigated in 100(17M) morbidly obese patients with BMI of 51(40-68)kg/m<sup>2</sup> who underwent obesity surgery. 100 healthy donors were taken as the control population. PCR-SSO method at low-resolution level was used for HLA genotyping. Statistical evaluation was done using Chi-square and Fisher's exact tests.

**Results:** Seventeen, twenty five and twelve different HLA-A, HLA-B and HLA-C alleles were identified respectively in two groups. We found that alleles frequency were very similar for all HLA loci in obese and control groups, although HLA-B\*45 (8%) ve HLA\*C\*15 (10%) alleles frequency in the patient population were significantly higher than the control population ( $p=0.001$  and  $p=0.04$ , respectively).

**Comments:** Present study demonstrates that HLA-B\*45 and HLA-C\*15 alleles were found to be higher in the patient population. HLA class I molecules present the foreign peptides to CD8<sup>+</sup> T cells and promote to activation of the adaptive immune system. We conclude that as these alleles might be important for triggering the inflammation in adipose tissue, they might be associated with morbid obesity.

#### A594

### **Disparities in the Effect of 26-Weeks of Aerobic and Resistance Training on the Prevalence of Metabolic Syndrome in Cancer Survivors**

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Cancer survivors have a higher risk of type-2 diabetes mellitus and cardiovascular disease due to treatment-related effects and fatigue-related reductions in exercise. The IMPAACT Study examined the effect of 9-months of combined aerobic and resistance training (CART) on prevalence of metabolic syndrome as an indicator of cardio-metabolic risk among cancer survivors. At baseline, 52% of participants experienced metabolic syndrome, with greater prevalence among survivors that completed treatment within the past 2 years (33%) as compared to those with 2+ years of time since last treatment (18%). The most noteworthy risk factor for metabolic syndrome at baseline was waist circumference, with the average for female participants at 100cm (SD16). Post-intervention, participants experienced the resolution of at least one metabolic risk factor and, subsequently, the prevalence of metabolic syndrome decreased to 26%. However, the prevalence of metabolic syndrome among Caucasian and Asian participants decreased by 80% while no decrease was observed among African-American and Hispanic participants. The intervention appeared to have the greatest influence on participants that were within 2 years of their last treatment (76% decrease) as compared to other survivors (19%). For individual risk factors, decreasing trends in triglycerides and fasting blood glucose and an increasing trend in high-density lipoprotein were suggested as participation increased. These findings suggest that CART may be most beneficial to the cardio-metabolic health of cancer survivors that have most recently completed treatment. These results also highlight the need to further examine the potential health disparities in metabolic risk among African-American and Hispanic cancer survivors.

## A595

### **Predictors of postoperative weight trajectory in adolescent laparoscopic sleeve gastrectomy (LSG)**

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**Background:** There is wide variation in post-LSG weight trajectory. The primary aim of this study is to determine if preoperative weight trajectory, and other factors, determine postoperative weight trajectory in adolescents LSG.

**Methods:** A retrospective analysis of 100 adolescent patients who underwent LSG from February 2011 to April 2019 was conducted. Preoperative weight loss (Pre-WL) was measured from the first visit (Wi) to the last preoperative admission (Ws). Postoperative weight loss (Post-WL) was measured from Ws onward. The effects of Pre-WL on Post-WL was assessed using a linear mixed-effects model with a quadratic term for time (months after surgery). Time (1<sup>st</sup> and 2<sup>nd</sup> order terms) was modeled as a random effect. Fixed effects included Pre-WL, age at surgery, race/ethnicity, gender, payer status, psychiatric diagnosis, and 10-day liquid diet WL. Patients were stratified into Gained or No Loss, >0-<5kg loss, 5-10 kg loss, and >10 kg loss. All analysis was conducted in SAS v. 9.4 (Cary, NC).

**Results:** Median age was 17 years. 69% had no Pre-WL. 81% had WL during the pre-op liquid diet (Table 1). Adjusted analysis showed the only significant predictor of post-operative weight trajectory (Figures A, B) was weight loss from the 10-day liquid diet (Estimate (SE): 0.385 (0.084),  $p < 0.001$ , Table 2). Pre-WL was not a significant predictor of Post-WL ( $p = 0.19$ ).

**Conclusions:** Preoperative weight trajectory does not predict postoperative weight trajectory. Preoperative liquid diet weight loss is associated with post-WL. Pre-WL should not be required for adolescents preparing for LSG.

## A596

### **WEIGHT REGAIN AFTER LAPAROSCOPIC SLEEVE GASTROSTOMY IS PART OF THE NATURAL HISTORY OF THE OPERATION**

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SAIMS

**Introduction:** The sleeve gastrectomy is plagued with progressive weight regain after an initial significant weight loss. The purpose of this study is to determine the pattern of weight loss and the weight regain after the sleeve.

**Method:** The records of patients who had a sleeve gastrectomy in 2011 were identified from a prospectively kept data base of bariatric operations performed at MBRSC. Data on the age, gender, BMI, co-morbidities, and weight of the patients who had a complete follow up for five years was collected reviewed and analysed as to the weight loss and weight regain.

**Results:** 152 patients underwent LSG at MBRSC in 2011. 50 patients were not eligible for review. 19 had had a revision operation and 31 had not completed the five years follow up. Data on the 102 patients with five years follow up was collected. There was a av. regain of 28.76% of the weight loss at five year follow up. The weight regain pattern was independent of the age, gender, initial BMI, or the presence of T2DM.

**Conclusion:** LSG is characterized with significant weight loss that reaches a maximum at two years after the surgery and starts a progressive linear regain of the lost weight in a significant number of the patients starting from three years and increasing with the follow up time. There were no particular factors in this series that were found to influence the weight regain.

#### A597

##### **Revision of gastric banding – gastric bypass has better weight loss but longer length of stay than sleeve gastrectomy**

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**Background:** In recent years, use of laparoscopic adjustable gastric banding(LAGB) has decreased but revisional bariatric surgery has become more common. The optimal approach to this patient population is unclear.

**Objectives:** Compare outcomes of LAGB patients who undergo conversion to sleeve gastrectomy(SG) or Roux-en-Y gastric bypass(RYGB)

**Methods:** Retrospective review of a prospectively collected database of 138 revisional procedures,performed by a single surgeon between 2015-2019.Groups were compared using SPSS software.

**Results:** Forty-eight patients(35%) underwent LAGB revision,mean age 47 years,85.4% female.Average pre-band BMI was 46.6,lowest achieved BMI–33.4(EWL 62%).All patients had weight re-gain(pre-revision BMI 43.4) and half of the patients also had a band-related complication.Twenty-three percent of revisions were robot-assisted and the remaining were laparoscopic; in 52% the band removal and revision were staged. There were 29 patients in the SG group(60%) and 19 patients(40%) in the RYGB group. The groups did not differ in demographics including age,gender,BMI and comorbidities. Compared to RYGB, SG patients had shorter procedure duration(126min vs 185min), shorter LOS(2 days vs 4 days). Two patients in the RYGB group had a major complication(1 vertical staple line leak and 1 bleeding) and none in the SG group.Weight loss one year post-revision was inferior after SG compared to RYGB– EWL 53% v 77%, TWL 20% vs 29%, delta BMI 8.66 v 13.51;this was statistically significant.

**Conclusion:** Conversion of LAGB to RYGB results in superior weight loss compared to SG at the expense of longer OR time and LOS.

#### A598

## **ABDOMINAL EXPLORATION FOLLOWING ROUX-EN-Y GASTRIC BYPASS: ADHESIONS AND INTERNAL HERNIAS IN PREDOMINANTLY FEMALE PATIENTS**

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**BACKGROUND:** We investigated the incidence of complications following Roux-En-Y gastric bypass (RNY-GBP), and factors that may better-predict the risk for abdominal exploration following bariatric surgery.

**METHODS:** A single-institution database from 2013-2017 was queried for cases of abdominal exploration in patients with a history of RNY-GBP. The primary endpoint was the incidence of specific postoperative complications. Secondary endpoints included time interval since RNY-GBP, gender, clinical presentation and history of prior abdominal surgeries.

**RESULTS:** Of the 98 cases with prior RNY-GBP, the most common finding upon reoperation was adhesive disease (adhesions to abdominal wall, interloop adhesions, or adhesive bands) with 30 cases found (30.6%), followed by internal hernia (29, 29.6%). 8% of patients were found to have a twisting or kinking of an anastomosis, 5% had anastomotic intussusception, 3% required hematoma evacuation, and 12% had negative explorations. The most common presentation was abdominal pain and oral intake intolerance, and a quarter of patients had small bowel obstruction diagnosed on preoperative CT. Only 8 of the cases were in males, 90 in female patients. Where prior operative records were available, the average time from initial RNY-GBP to reoperation was 3.03 years. 66 patients (67%) had a history of prior abdominal surgery other than RNY-GBP.

**CONCLUSIONS:** All patients should be counseled prior to RNY-GBP regarding the long-term risks of requiring reoperation after bariatric surgery. Our data suggests an even higher risk of reoperation in female patients and in those who have undergone other abdominal operations, presumably due to the higher burden of adhesive disease.

### **A599**

#### **Long Term Outcomes of Laparoscopic Sleeve Gastrectomy in an Adolescent Population.**

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#### **Background**

Sleeve gastrectomy (SG) is the most performed bariatric surgery in adults and adolescents with obesity. In a previous article we studied the efficacy and safety of SG in adolescents. Herein we report their long-term results. Here is a scarcity of literature on similar long term reporting.



## Methods

121 adolescent patients underwent SG at Makassed General Hospital and the American University of Beirut Medical Center between January 2011 and September 2014, they were retrospectively reviewed.

## Results

The study included 109 patients with a median age of  $18.51 \pm 2.11$  years (range 11–21). 70.6% were female. Mean preoperative weight and body mass index were  $117.7 \pm 23.9$  kg (range 75.0; 220.0 kg) and  $41.83 \pm 6.56$  kg/m<sup>2</sup> (range 32.3–71.0 kg/m<sup>2</sup>), respectively. Mean excess weight loss at 1 to 8 years was  $83.53 \pm 22.32$ ,  $88.05 \pm 23.61$ ,  $88.34 \pm 25.60$ ,  $83.08 \pm 26.82$ ,  $78.97 \pm 27.16$ ,  $74.53 \pm 29.40$ ,  $75.15 \pm 33.62$  and  $78.07 \pm 23.74$  respectively. Mean BMI at 8 years was  $28.68 \pm 4.17$  (range 23.74; 35.11).

Diabetes, hypertension, and dyslipidemia resolved in 100%, after 5 years follow up.

Gastroesophageal reflux disease was reported in 17.4% of patients initially and decreased to 10.3% who were followed up at a minimum of 5 years.

Symptomatic gallbladder stones and weight regain necessitating surgical intervention percentages were (13.7%), (4.5%) respectively.

## Conclusion:

On a long term follow up, SG showed effectiveness and safety in treating adolescents' obesity by significant reduction in EWL and complete or partial remission of associated co-morbidities.

## A600

### **PRE-OPERATIVE CLINICAL CHARACTERISTICS BUT NOT LONG-TERM SLEEVE GASTRECTOMY (SLEEVE) OUTCOMES VARY BY RACE DIFFERENTLY IN WOMEN VERSUS MEN**

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Inspira Health Network<sup>1</sup>

**Introduction:** Clinical characteristics and outcomes of bariatric surgery vary by race and sex. However, variations between male and female SLEEVE patients by race have not been completely investigated.

**Objective:** To identify pre-operative/outcome variation by race in women and men undergoing Laparoscopic Sleeve Gastrectomy.

**Methods:** Data (weight, BMI and 31 weight-related co-morbidities) from 8,966 BOLD database patients who underwent SLEEVE was analyzed retrospectively by race (Black, Caucasian, Hispanic, Other (Native American, Pacific Islander, two or more races reported)) in two separate groups: Women (n=6,685) and Men (n=2,281). Outcomes analysis used general Linear Models that included baseline and post-operative data and were modified for binomial distribution of

dichotomous variables.

Results: Female pre-operative weight, BMI, age, unemployment, hernia, panniculitis, cholelithiasis, GERD, liver disease, stress incontinence(SUI), CHF, hypertension, sleep apnea(OSA), pulmonary hypertension(PHT), dyslipidemia, lower extremity edema(LEE), fibromyalgia, depression, mental health diagnosis(MHD), psychological impairment(PI), musculoskeletal pain(MSP), alcohol/tobacco/substance abuse (N=24) varied by race ( $p<0.05$ ). Male pre-operative weight, BMI, age, hernia, GERD, liver disease, CHF, hypertension, dyslipidemia, LEE, OSA, MSP, depression, PI, and tobacco abuse (n=15) varied by race ( $<0.05$ ).

Additionally, insurance, impaired functional status, back pain, DVT/PE varied by race in men. 12 month female weight, BMI, asthma, back pain, MSP, PTC, and male weight, BMI, hypertension, PHT varied. No variation at 24 months.

Conclusions: Pre-SLEEVE clinical characteristics vary by race in distinctly different female/male patterns. Variations by race in both men and women decreases by 12 months and resolves completely 24 months post-SLEEVE. These pre-SLEEVE findings may facilitate early clinical management.

## A601

### **Comparative study of laparoscopy and robotics in revisional bariatric surgery – outcomes in 138 patients**

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**Background:**The rate of both revisional and robotic bariatric surgery is increasing. The advantages of robotic surgery in this setting are not clearly defined.

**Objectives:**Compare patient characteristics and outcomes of laparoscopic and robotic revisional bariatric surgery

**Methods:**A database of revisional surgery performed by a single surgeon between 2015-2019 was reviewed. The patients were divided based on laparoscopic or robotic approach and the two groups were compared using t-test in SPSS.

**Results:**Out of 138 revisions, 87 were robotic(63%) and 51-laparoscopic(37%).The groups did not differ significantly in age(46y), sex(85% female),BMI (43.2).Robotic surgery was used more frequently for more complex procedures(Figure 1).The robotic group had more patients with history of another revision–19.5% vs 5.8%.Robotic revisional operations took longer-268 min, compared to 142 min for laparoscopy.In spite of the higher complexity of cases,outcomes were not statistically different between groups(Table 1)-equivalent LOS(2days) and rate of readmission(4%).Complication rate was higher in the robotic group, but the difference was not statistically significant-major complications(5.7% vs 1.9%).There were 4 leaks in the robotic group and none in the laparoscopic group (4.5% vs 0%,  $p=0.045$ ).The EWL at 1 year was lower in the robotic group(52.5% vs 67.3%). This is explained by the higher number of patients in the robotic group with history of gastric bypass, which in our series, have lower weight loss compared to band and sleeve revisions.

**Conclusion:** Robotic revisional bariatric surgery has a similar safety profile to laparoscopy, even when used selectively for more complex operations.

## **A602**

### **Efficacy of Routine Post-Operative Fluoroscopic Leak Tests Following Weight Loss Surgery: a Single Center Retrospective Review**

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University of Colorado<sup>1</sup> Denver Health Medical Center<sup>2</sup>

**PURPOSE:** To evaluate the efficacy of routine fluoroscopic leak tests performed on the immediate post-operative weight loss patient. We aim to determine the rate of positive fluoroscopic leak tests, explore the unintended radiation consequences and analyze the cost-benefit analysis.

**METHODS AND MATERIALS:** We analyzed a prospectively acquired database of patients who underwent weight loss surgery at a bariatric center of excellence. Patients underwent gastric bypass or sleeve gastrectomy. We collected patient demographic information, intraprocedural metrics and diagnostic findings, including radiation exposure data.

**RESULTS:** 173 subjects underwent routine fluoroscopic leak test on post-operative day one following weight loss surgery. Average body mass index (BMI) at the time of operation was 44.4. There was one fluoroscopic leak test (0.6%) reported as positive; the subject was clinically well, monitored and safely discharged on post-operative day two. Regarding radiation exposure, average fluoroscopy time was 64.5 seconds; average absorbed dose was 55.2 mGy; average dose area product was 1041.1 Gy $\cdot$ cm<sup>2</sup>. Combined professional and technical fees for a single phase upper GI study is \$708.69 USD under the current ICD-10 system.

**CONCLUSION:** Positive post-operative fluoroscopic leak tests are exceedingly rare when performed routinely following weight loss surgery and provide minimal clinical benefit. Leak tests can be safely excluded from the post-operative algorithm in the clinically appropriate patient. Large quantifiable radiation doses are conferred to patients with obesity. Fluoroscopic leak tests cost over \$700 USD per study.

## **A603**

### **Long-term use of acid suppression therapy does not differ between gastric bypass and sleeve gastrectomy patients**

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Toms Augustin *Cleveland OH*<sup>1</sup>  
Cleveland Clinic<sup>1</sup> Ohio State University<sup>2</sup>

**BACKGROUND:** Gastroesophageal reflux disease (GERD) is common in patients with obesity and different bariatric procedures have different effects on the symptoms. There is little long-

term data regarding acid suppression therapy (AST: proton pump inhibitor or H2-blocker) use after bariatric surgery.

**METHODS:** Retrospective data of patients with institutional health insurance who underwent sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB) from 2009-2016 was analyzed. Pre- and post-surgical AST use was compared, and EGD findings if performed.

**RESULTS:** There were 261 (70.5%) RYGB and 109 (29.5%) SG patients; these two groups were comparable in age, gender distribution, hypertension, obstructive sleep apnea, and COPD.

Diabetes was more common among RYGB patients (42.9% vs. 23.9% SG,  $p=0.001$ ). Over a median follow-up of  $5.5 \pm 2.1$  years, more RYGB patients were found to be on AST post- than pre-surgery (34.9% vs 20.1%,  $p<0.05$ ). Similarly, more SG patients were on AST post- than pre-surgery (41.3% vs. 20.2%,  $p<0.05$ ). There was no difference between RYGB and SG in prevalence of esophagitis or gastritis on endoscopy, but 28 (10.8%) RYGB patients had ulcer disease, compared to zero SG patients ( $p<0.05$ ).

**CONCLUSION:** Our study demonstrates increased AST use after both SG and RYGB compared to pre-surgery. While RYGB patients could have been on AST for ulcer disease post-surgery, there was no difference in rates of esophagitis between the two groups. Regardless, preoperative AST use should not be the sole determinant of procedure choice; more accurate predictors of GERD and AST use after bariatric surgery are needed.

#### **A604**

#### **Improvement in Hemoglobin A1c after Laparoscopic Roux-en-Y Gastric Bypass and Sleeve Gastrectomy in an Ethnically Diverse Population**

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Harlem Hospital Center<sup>1</sup> Harlem Hospital<sup>2</sup> Wyckoff Heights Medical Center<sup>3</sup> Osceola Regional Medical Center<sup>4</sup>

**Background:** Obesity is a well-known risk factor for type 2 diabetes mellitus (T2DM). This study compared the effects of laparoscopic Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) on hemoglobin A1c (HbA1c) in a predominantly Hispanic and African-American population.

**Methods:** A 5-year retrospective review of T2DM patients from a single center who underwent RYGB or SG was performed. Changes in pre-operative and annual post-operative HbA1c and BMI were compared between the two procedures, adjusting for age, sex, race, and hypertension, with linear mixed-effects or logistic regression models. A  $p$ value  $< .05$  was considered statistically significant.

**Results:** Of 676 patients, 84.8% were females; the mean age was 47 years; 43.1% were Hispanics, 40.3% were African-American, and 48% underwent RYGB while 52% had SG. Compared to pre-operative levels, HbA1c declined significantly ( $p= <.05$ ) at 1yr (21%), 2yrs (20%), 3yrs (20%), 4yrs (18%) and 5yrs (14%) post-operative. At 1 year, 42% of T2DM patients reached HbA1c  $< 5.7$  with RYGB vs. 27% with SG. Also, RYGB patients had greater improvements in mean HbA1c at 1 year compared to SG (25% vs 17%,  $p= .001$ ). The reduction in HbA1c between procedures was not significant beyond the 1 year interval ( $p= >.05$ ).

Conclusion: Both RYGB and SG resulted in significant decreases in HbA1c levels, correlating with improvements in BMI. RYGB had the greatest effect on this ethnically diverse cohort at 1-year post op, but there was no significant difference in HbA1c reduction for RYGB vs SG at 1 year after surgery.

#### **A605**

#### **SWEDISH ADJUSTABLE GASTRIC BAND BY VIDEOLAPAROSCOPY: 5 AND 10 YEARS FOLLOW UP**

Pablo Omelanczuk *Guaymallen*

Clinica Quirurgica S A

**Objective:** To show the results of five and ten years follow up in patients with morbid obesity surgically treated by videolaparoscopy placing a Swedish adjustable gastric band.

**Method:** This is a retrospective study of patients that underwent surgical treatment for obesity through a Swedish adjustable gastric band placed by videolaparoscopy. 80 patients from a single surgeon at 1 bariatric Center in Mendoza, Argentina were evaluated. All patients were evaluated preoperatively by the multidisciplinary team. Mean age was 40. Sex ratio was 83 % female 17 % male and mean preoperative BMI was 47,13 kg/m<sup>2</sup>.

**Results:** All patients underwent laparoscopic treatment. The average hospital stay was 24 hours. Operative time average was 40 minutes. The average post-operative % EWL at one, five and 10 years was 39.7 %, 56.9 %, and 34,12 %. Follow up was, 75 % at five years and 70 % at 10 years. Acute complications: one patient had laceration of the liver, and another developed port infection. Late complications were; erosion (0.9%), slippeage (1,3%). Thirty two patients (40 %) had a conversion, 28 patients (90 % ) to RYGB and 4 (10 %) to sleeve gastrectomy.

**Conclusions:** The surgical treatment of obesity by placing and adjustable gastric band, results at 10 years are not good in terms of weight loss, complications and the need of conversion to another bariatric procedure. All patients need a well as a strict follow-up in order to get good results.

#### **A606**

#### **Use of Incretin-Based Therapy as An Adjunct to Endoscopic Revisions After Bariatric Surgery**

Winni Mathur *INDORE*<sup>1</sup>, Mohit Bhandari *Indore*<sup>1</sup>, Mathias Fobi *Indore CA*<sup>1</sup>, SUSMIT KOSTA *Indore*<sup>1</sup>

MOHAK BARIATRICS AND ROBOTICS<sup>1</sup>

**Background:** Revisional surgery is an essential component of addressing poor weight loss or weight regain following primary bariatric surgery. Weight regain after bariatric surgery is conventional and can be managed with less invasive endoscopic revision technique and incretin-based medications therapies.

**Objective:** This study was undertaken to determine the outcome in terms of weight loss, feasibility and safety of the 2<sup>nd</sup> stage endoscopic revisions with use of incretin-based therapy (RES-IBT) after previous attempts resulted in poor results.

**Material and Methods:** We retrospectively identified patients who underwent a 2<sup>nd</sup> stage R-ES-IBT (Victoza-liraglutide) for inadequate weight loss or significant weight regain after the 1<sup>st</sup> stage operations. Data were analysed to establish patient demographic characteristics, perioperative parameters, and postoperative outcomes.

**Results:** We studied 27 (RES-IBT) patients who had primary bariatric surgery. Revised patients were from LSG(59.3%) followed by LGB(25.9%) and OAGB(14.8%).

The av. age was 48.74±9.93 years, 14 (51.8%) were males. The average time between 1<sup>st</sup> stage and 2<sup>nd</sup> the stage was 44.62 months. Average nadir weight and BMI after the 1<sup>st</sup>stage was 91.21±16.40 kgs and 34.0±2.1 kg/m<sup>2</sup>. The average weight and BMI at the time of the 2<sup>nd</sup> stage were 102.31±18.73 kgs and 39.52±4.5 kg/m<sup>2</sup>. The av. weight at 1, 3 and six months after the RES-IBT was 89.71, 84.31 and 81.32 kgs, respectively. The adverse effects were ≥3%, and resolution of comorbidities was scientifically improved.

**Conclusion:** Inadequate weight loss or significant weight regain after bariatric surgery could be safely and effectively managed by endoscopic revisions by using of incretin-based therapy.

## A607

### Can Incretin-Based Therapies augment results of Endoscopic Bariatric Procedures

Winni Mathur *INDORE*<sup>1</sup>, Mohit Bhandari *Indore*<sup>1</sup>, Mathias Fobi *Indore CA*<sup>1</sup>, SUSMIT KOSTA *Indore*<sup>1</sup>

MOHAK BARIATRICS AND ROBOTICS<sup>1</sup>

**Background:** Incretin-based therapies are safe and effective medications for weight loss and glycaemic control after bariatric surgery.

**Objectives:** This study aims to evaluate the effectiveness of Liraglutide after undergoing endoscopic bariatric therapies and also comparing the results with a cohort of endoscopic bariatric therapies which were not treated with Liraglutide.

**Methods:** We conducted a retrospective study of 2 cohorts of patients with and without Victoza® therapies (VT) who had endoscopic bariatric therapies with T2DM and obesity. The primary outcome measures were the differences in weight at six months and glycated haemoglobin (HbA1C) between both groups.

**Results:** A total of 57 patients were included, 27 with-VT and 30 without-VT. The average age was 44.67±12.45 years, 64.9% were males. The average initial BMI and HbA1C were 41.56±6.11 kg/m<sup>2</sup> and 6.63±0.74% for the with-VT group, and 41.54±6.5 and A1C 6.61±0.55% for the without-VT group, respectively. We started 0.6mg dose and continued this dose for at least two weeks while monitor weight and symptoms then increased to 1.2, 1.8 up to 3.0 mg under monitoring in the with-VT group. At six months, weight and HbA1C were significantly decreased in both groups (with-VT group: %ΔTWL 23.11±2.29; ΔA1C (-0.8%) 5.83±0.7% and

without-VT  $\% \Delta \text{TWL}$   $18.62 \pm 3.09$ ;  $\Delta \text{A1C}$  ( $-0.52\%$ )  $6.11 \pm 0.55\%$ ; all results  $p=0.005$ ). There were ( $p=0.001$ ) significant higher weight and A1C reduction found for with-VT group.

**Conclusions:** Incretin-based therapies with endoscopic bariatric therapies achieved a significant reduction in weight and HbA1C at six months treated with liraglutide, showing good gastrointestinal tolerance.

## A608

### Using choice architecture interventions to nudge costumers towards healthier food purchase in real-life grocery stores. A review.

Helena Slapo *Oslo*<sup>1</sup>, Samira Lekhal *Oslo*<sup>2</sup>, Alexander Schjøll *Oslo*<sup>3</sup>, Ingunn Sandaker *Oslo*<sup>4</sup>, Knut Ivar Karevold *Oslo*<sup>5</sup>

PhD candidate at Oslo Metropolitan University and lead at GreeNudge<sup>1</sup> Head of Regional Morbid Obesity Center and chairman GreeNudge<sup>2</sup> Senior researcher<sup>3</sup> Oslo Metropolitan University<sup>4</sup> GreeNudge<sup>5</sup>

This review discusses choice architecture interventions, in real-life grocery stores, as a strategy to improve the healthiness of customer's food choices. Articles were categorized by intervention type, targeted food item and effect of intervention. Included studies had to be implemented in real grocery stores, output data had to be objective measurements of changes in real-food purchase or consumption Intervention had to be choice architecture intervention, nudge or another inside store intervention. Intervention studies were grouped by intervention type and what food items they impacted. Studies with multiple interventions or dependent variables were treated separately. Literature search identified 68 (n) articles reporting on 200 (k) intervention studies. Identified intervention types are price, priming, placement and prompts. Price and placement were the most effective interventions towards more healthy food choices with respectively significant or variable effect in 63% and 36% of interventions. 87% of studies evaluated more than one intervention. Choice architecture interventions could be further tested as a tool to influence consumers towards more haealthy food choices and thereby reduce the rising prevalence of NCDs world.

## A609

### Effects of gastric bypass on protein nutritional status.

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Lille Univ Hospital<sup>1</sup>

### Background:

One Anastomosis Gastric Bypass (OAGB) with a longer biliary (B), but no alimentary (A) limb is proposed as an alternative to Roux-en-Y gastric bypass (RYGB). Some studies suggest that OAGB carries higher risk of protein deficiency, however impact of different intestinal limbs

on protein status is unclear.

**Objective:**

To compare the impact of each intestinal limb on protein status in a relevant preclinical model of gastric bypass.

**Methods**

Gastric bypass with various lengths of A, B, and common (C) limbs were performed in adult minipigs (n=5-7/group) : Sham; OAGB (no A-short B-long C); distal OAGB (dOAGB : no A-long B-short C), distal RYGB (dRYGB : long A-short B-short C), or dOAGB with B partial resection (rOAGB : no A-short B-short C). Protein nutritional status was assessed by profiling 20 amino acids (AAs) in fasting blood samples after 2 weeks by liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) .

**Results**

Plasma AA profile was modified in all groups as compared to Sham. The changes were marked in OAGB and maximal in dOAGB (20-40%: Ornithine, Arginine, 40-60%: Hydroxyproline, Citrulline). Despite similar length of C limb, these AA changes were attenuated in dRYGB, in which some AAs were even elevated compared to Sham (20-40% : aromatic AAs, Lysine, 40-60%: Methionine, Cysteine). B resection in rOAGB has an important impact on AA profile.

**Conclusion**

The AA plasma profile was altered in OAGB. This effect was more pronounced in dOAGB, but attenuated in dRYGB, suggesting a protective role of the A limb.

**A610**

**Nurse Practitioner led Telephone Intervention to Improve Attrition After Bariatric Surgery**

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Mayo Clinic<sup>1</sup>

Background: Bariatric surgery remains the most successful modality for sustained weight loss. Attrition rates to follow up visits are reported between 3-63% (Moroshko, Brennan, & O'Brien, 2012). Patient attrition was defined as patients not seen for his/her planned appointment as dictated by established protocol in the Bariatric Surgery program. There is a gap in knowledge regarding how to decrease attrition.

Objective: The main purpose of this project was to decrease attrition rates at the two-year post-surgery visit in the post bariatric surgery population.

Methods: A telephone intervention was completed at four to six months prior to second anniversary of surgery. A chart review was completed at approximately two months prior to each patient's second surgical anniversary to determine if a follow up appointment was scheduled and/or completed.

Results: The historical attrition rate observed for the year (2014-2015) prior to this study was 61%. The overall rate of attrition in the study was 35%. This was statistically significant (p=.004). Patients with a psychological diagnosis prior to surgery had a 44% attrition rate compared to a 25% attrition rate in patients without a psychological diagnosis; this difference did



not achieve statistical significance.

**Conclusions:** This study showed that a phone call intervention prior to a bariatric surgery patient's second surgical anniversary led to lower patient attrition at the two-year follow-up visit. However, attrition rates remain high at 35%. Additional investigation is warranted to further evaluate other strategies that might additionally improve patient attrition rates.

## A611

### **GLOMERULAR FILTRATION RATE FORMULAS IN BARIATRIC PATIENTS: WHICH BEST PREDICTS RISK?**

Michael Mazzei *Philadelphia PA*<sup>1</sup>, Michael Edwards *Jacksonville FL*<sup>2</sup>  
Temple University Hospital<sup>1</sup> Mayo Clinic<sup>2</sup>

**Introduction:** Renal disease is a known risk factor for adverse bariatric surgical outcomes. Chronic kidney disease (CKD) stage may be estimated based on several formulas for glomerular filtration rate (GFR), but it is not clear how formula accuracies differ in the morbidly obese population.

**Methods:** From the 2017 MBSAQIP database, we identified patients who had metabolic and bariatric surgery. GFR was calculated using several common formulas: Cockcroft-Gault formulas using actual, adjusted, and ideal body weight, Modification of Diet in Renal Disease (MDRD) formula, and the CKD-Epidemiology formula. Calculated GFR was compared between formulas as a predictor of adverse renal outcomes.

**Results:** 149,430 patients had the requisite data to calculate GFR by all methods. There were significant differences in the CKD stage calculated by each method, with between 46.6– 96.0% in stage 1, 2.4– 44.9% in stage 2, 0.3– 8.5% in stage 3a, 0.2– 2.5% in stage 3b, 0.1– 0.5% in stage 4 CKD, and 1.0 – 1.1% in stage 5 CKD. 217 (0.1%) had adverse renal outcomes. Area under the ROC curve for the formulas varied from 0.634 (denoting poor accuracy) to 0.727 (denoting fair accuracy), with the CKD-EPI most predictive of adverse renal sequelae (Figure 1).

**Conclusions:** Estimations of glomerular filtration rate vary dramatically by the choice of formula used, which can significantly under- or over-predict the likelihood of renal complications. In this large bariatric dataset, the most accurate predictor was the CKD-EPI formula, which is independent of weight. In morbid obesity, weight-based GFR formulas may be unsuitable.

## A612

### **Anti-Obesity Pharmacotherapy: Putting Guidelines into Action**

Susan Bowlin *Grapevine TX*

Fortis BMI

Current guidelines and pharmacologic options for the treatment of obesity can be a challenge to get a handle of. This session will provide a review of current FDA anti-obesity medication options including indications, side effects and expected results. We will discuss the importance

of a comprehensive approach to the treatment of obesity, as a medication alone is not effective treatment. We will wrap up with a case study application of key principles in selection of pharmacologic agents and on-going monitoring to maximize patient outcomes. Utilization of anti-obesity medications (AOM) both before and after bariatric surgery will be discussed.

### A613

#### **IMPACT OF A BARIATRIC SURGERY CLINIC-BASED PHARMACIST ON LENGTH OF STAY AND PATIENT SATISFACTION**

Nicole Nguyen *San Francisco CA*<sup>1</sup>, Althea Han *San Francisco CA*<sup>1</sup>, Salem Kamalay *San Francisco CA*<sup>1</sup>, Nancy Hung <sup>1</sup>  
UCSF Medical Center<sup>1</sup>

**Background:** Pharmacist integration into various clinic settings has been shown to prevent medication errors, improve provider workload and patient satisfaction, but pharmacist integration into bariatric surgery clinic is novel. Pharmacists can address bariatric surgery's effects on medication absorption and bioavailability. This study evaluated the impact of a bariatric clinic pharmacist on clinical outcomes, medication errors, and patient experience.

**Methods:** This was a retrospective chart review of adults admitted for bariatric surgery at a tertiary academic medical center between January 2015 and October 2018. Patients who received a preoperative pharmacist consultation (intervention group) were compared to historical controls. A patient experience survey was administered postoperatively to the intervention group. The primary outcome was hospital length of stay (LOS). Secondary outcomes included corrected medication errors on reconciliation and estimated cost-savings for pharmacist interventions and adverse drug event (ADE) prevention.

**Results:** The median LOS of 55.5 hours in the intervention group (n=68) was not significantly different from the median 57.9 hours in the control group (n=67). The clinic pharmacist made an average of 13 interventions per patient, including preoperative dose tapers and discontinuation of high risk medications for 16% of patients. The estimated annual cost-savings of pharmacist interventions in this study was \$751,194. The intervention group survey had a 60% response rate, where 97% strongly agreed or agreed to overall satisfaction with the preoperative pharmacist consultation.

**Conclusion:** Although hospital LOS did not significantly differ between groups, preoperative pharmacist consultation prevented potential ADEs, contributed to over \$750,000 of estimated annual cost-savings, and provided strong patient satisfaction.

### A614

#### **Step By Step Comparison Between Standard Sleeve Gastrectomy And In Situs Inversus.**

Ibrahim Hassan *Kuwait*

Sidra(Alomooma)Hospital,Kuwait

Introduction: Laparoscopic Sleeve Gastrectomy (LSG) is recognized as a stand-alone operation and a definite treatment for morbid obesity worldwide. Situs Inversus Totalis (SIT) is a congenital anomaly presents in 0.01% of the population, results in complete mirror image reversal of all thoracic and abdominal organs , transmitted through autosomal recessive inheritance. LSG can be done safely with some diificulties in patients with SIT having morbid obesity and candidate for surgery . Case Report: A 29 years old male presented to surgical clinic with morbid obesity with a body mass index (BMI) 44.2 KG/m<sup>2</sup>. Patient was known to have SIT since birth. Here is a step by step comparison between this case and another male (BMI 45) who had LSG in the same hospital and by the same surgical team. The video will show the challenges during dissection and step by step comparison between the standard LSG and doing the procedure mirror imaged in situs inversus. Conclusion: LSG with staple line plication and omentopexy can be done safely but with some technical difficulties in patients with situs inversus totalis.

#### **A615**

#### **Staging the Super Super Obese : Second Stage Surgery for the Super Obese Patient with Metabolic Syndrome with Long Limb OAGBP**

Jaime Ramos-Kelly *Tijuana*

HOSPITAL ANGELES TIJUANA

30 year old woman from Texas USA whom 3 years earlier 03/2016 underwent a sleeve gastrectomy , patient was superobese BMI 78 with DM2 , Sleep Apnea , HBP and Dyslipidemia , BMI dropped to 60.2 with resolution of DMII . 03/2019 comes back to have second stage / conversion surgery after losing 150 pounds and regaining 30 from a baseline weight of 495 pounds . She underwent preop upper endoscopy and meal test for the second surgery , we offered her a long limb OAGBP . In both surgeries a Pre Op protocol was displayed that included nutritional support , medical appointments with various subspecialists , tight control of DMII , HBP , dyslipidemia and use of CPAP as well as a 3 weeks preop diet . As mentioned above for the conversion surgery I ordered an upper endoscopy and a meal test . The patient was well controlled of her associated conditions to sustain a second procedure .

#### **A616**

#### **Robotic Gastric Bypass Revision for Recidivism**

Maher El Chaar *Allentown PA*

St Luke's University Hospital and Health Network

#### **Background/Introduction:**

Recidivism is a growing problem in bariatric surgery. It's estimated that 15-35% of bariatric patients exhibit inadequate weight loss (less than 50% Excess Weight Loss, %EWL) or weight regain (more than 15% of the maximum weight initially lost). Those patient usually present for a

revision in order to achieve more weight loss or because of relapse of co-morbidities. The use of the robotic platform in bariatric surgery is controversial because of cost and lack of evidence. One of the advantages of the robotic approach in bariatric surgery, however, is in revisional cases. Revisional cases are technically difficult and are associated with higher incidence of postoperative adverse events. The use of robotic surgery in revisional cases can offer some technical advantages over the standard laparoscopic approach.

**Objective:**

To illustrate the use of robotic surgery in a revisional bariatric case.

**Methods:**

In this video we present the case of a 50 yo female (BMI=46) who presented 10 years following a laparoscopic gastric bypass and was found to have a dilated gastrojejunostomy anastomosis (>4 cm) and also a large non-excluded fundus. After enrollment in our revisional program and after completion of a 3 month physician supervised medical weight loss program she underwent a robotic revision.

**Results:**

This video demonstrates the successful completion of a robotic gastric bypass revision with the reconstruction of a novel gastric pouch and gastrojejunostomy anastomosis performed in a hand sewn fashion.

**Conclusion:**

Patient was discharged on POD#1 and lost 35% of her EWL at 3 months.

**A617**

**Robotic Band Removal, Paraesophageal Hernia Repair and Sleeve Gastrectomy In a Chronic Slippage Patient Using One Stage Approach**

Maher El Chaar *Allentown PA*

St Luke's University Hospital and Health Network

**Background/Introduction:** Adjustable Gastric Band Placement is falling out of favor in the United States because of the high incidence of complications and poor weight loss. Band removal and conversion to a gastric bypass or sleeve gastrectomy is becoming one of the most commonly performed bariatric revisional procedures. We have previously reported on the safety of band removal and conversion to gastric bypass or sleeve gastrectomy using a single stage approach. However, the one stage approach remains controversial and many continue to advocate for a two stage approach. The use of the robotic platform is advantageous in revisional cases and can be used for better dissection in a one stage approach.

**Objective:** To demonstrate how the use of the robotic platform in a single stage band removal and sleeve gastrectomy can be done safely and effectively.

**Methods:** In this video we present the case of a 40 yo female with BMI=41 s/p laparoscopic adjustable gastric band who presented with poor weight loss, chronic nausea and vomiting and was found to have evidence of chronic slippage and a large paraesophageal hernia

**Results:** Video demonstrates the successful completion of a one stage band removal, paraesophageal hernia and sleeve gastrectomy. Patient was discharged on POD#1, patient experienced no adverse events on follow up visits

**Conclusion:** Robotic surgery offers the advantage of more meticulous dissection of the band pseudocapsule at the time of band removal and allows the completion of a one stage band removal and sleeve gastrectomy without the need for a two stage approach

## **A618**

### **Robotic Revision of a Bleeding Marginal Ulcer Following a Roux en Y Gastric Bypass**

Maher El Chaar *Allentown PA*<sup>1</sup>, Marlon Pastrana *Allentown PA*<sup>2</sup>, Leonardo Claros *Allentown PA*<sup>2</sup>  
St Luke's University Hospital and Health Network<sup>1</sup> St Luke's University Hospital<sup>2</sup>

#### **Background/Introduction:**

Marginal ulceration can occur in up to 20% of cases. The etiology is unclear. Many authors have suggested that smoking, fistula, H. Pylori infection, foreign bodies, NSAID use or even obstructive sleep apnea status can contribute to the development of marginal ulceration. Marginal ulcers can present with pain, dysphagia, perforation or bleeding. The treatment of a bleeding ulcer is supportive. Endoscopic intervention may be required. In refractory cases patient may have to undergo a revision. Robotic surgery can offer many advantages in revisional surgery and potentially lead to improved outcome.

#### **Objective:**

To illustrate the use of robotic surgery in a revisional bariatric case.

#### **Methods:**

In this video we demonstrate the case of a 61 yo male s/p laparoscopic gastric bypass who developed a bleeding chronic marginal ulcer and failed endoscopic management. Patient underwent a revision of the ulcer and redo-gastrojejunostomy.

#### **Results:**

Patient did very well and was discharged on POD#4

#### **Conclusion:**

Robotic revision of gastric bypass is safe and effective and provides the advantages of better dissection and easier hand sewn reconstruction of the gastrojejunostomy anastomosis

## **A619**

### **OAGB AFTER LAGB VIDEO PRESENTATION**

Midhat Abu sneineh *Jerusalem*  
Asaf harofeh medical center

The technique used for R-OAGB/MGB is based on a 5-port approach . The gastric sleeve is dissected free from firm adhesion between the staple line and surrounding tissues, starting from

the distal staple line and proceeding to the angle of His. The first step of R-OAGB/MGB involved a calibrated (36 F tube) sleeve using blue Endo GIA reloads removing all the excessive gastric tissue. For patients with previous LGB, the gastric band was freed from the surrounding capsule and adhesions and cut and extracted through the 15 mm port. The internal fibrous tissue between the band and the stomach was removed as well to prevent stenosis of the tube at this level. The gastric greater curvature was then completely freed starting at 4 cm proximal to the pylorus using LigaSure (Covidien, Minneapolis, MN, USA) along with the direct release of lower sac adhesions and scarring to the left crus. A sleeve gastrectomy was then performed as described above.

## **A620**

### **Laparoscopic Hiatal Hernia Repair after Initial Failure of Repair at the Time of Sleeve Gastrectomy**

Rena Moon *Orlando FL*<sup>1</sup>, Jameson Wier *Orlando FL*<sup>1</sup>, Andre Teixeira <sup>1</sup>, Muhammad Jawad *Orlando FL*<sup>1</sup>

Orlando Regional Medical Center<sup>1</sup>

**Introduction:** 38-year-old female with no symptomatic reflux who underwent a sleeve gastrectomy for morbid obesity. At the time of surgery, she was found to have an approximately 5 cm hiatal hernia, which was repaired posteriorly. Post-operatively, she developed significant nausea and vomiting. Upper GI study and CT scan demonstrated a failure of the hiatal hernia repair with a significant portion of the stomach in the chest. She was taken back to the operating room for repair.

**Methods:** The abdomen was entered laparoscopic. The hiatus was examined. The previous repair was intact, but the proximal sleeve was herniated into the chest. The sutures were removed, and the sleeve was reduced back down into the abdomen. A 40F ViSiGI tube was placed into the sleeve. The hiatal hernia was again repaired posteriorly using a 0 Ethibond. The upper portion of the sleeve was then sutured to the left crus with interrupted 0 Ethibond. The staple line of the sleeve was then sutured to the retroperitoneum with a running absorbable suture.

**Result:** Postoperatively the patient did well, without significant nausea this time. An upper GI was performed on POD#1 which demonstrated resolution of the hiatal hernia and normal passage of contrast. She was seen in the clinic one week post-operatively and was tolerating a liquid diet without issue.

**Conclusion:** Laparoscopic primary hiatal hernia repair with additional tacking of the sleeve is a feasible approach for failure of an initial hiatal hernia repair.

## **A621**

### **Robotic Conversion of Single-Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy (SADI-S) to Mini Gastric Bypass due to Malnutrition**

Rena Moon *Orlando FL*<sup>1</sup>, Andre Teixeira *Orlando FL*<sup>1</sup>, Muhammad Jawad *Orlando FL*<sup>1</sup>

Orlando Regional Medical Center<sup>1</sup>

**Introduction:** 41-year-old male with a history of single-anastomosis duodeno-ileal bypass with sleeve gastrectomy(SADI-S) in 2014 presented in 3 years later with liver cirrhosis related to protein malnutrition. At the time, reversal was discussed but the patient did not follow-up. Patient re-presented to the clinic 2 years later with continued weight loss, severe malnutrition with liver cirrhosis, and renal failure requiring dialysis. He was taken back to the operating room(OR) for conversion of SADI-S to mini gastric bypass.

**Methods:** Adhesions between the loop of the ileum and the duodeno-ileal anastomosis were taken down. Using the robotic stapler, the duodeno-ileal anastomosis was taken down, finding that the lumen of the ileum was not compromised. Jejunum at the ligament of Treitz was edematous and swollen, so the jejunum 2 feet proximal was brought up to the antrum of the stomach.

A handsewn anastomosis side-to-side between the antrum and the jejunum was performed using 2-layer anastomosis. After completing the anastomosis, we looked at the anastomosis endoscopically. There is no leakage from the anastomosis.

**Results:**On postoperative day(POD) 3, the patient complained of increased abdominal pressure and difficulty breathing. He was taken back to the OR for exploratory laparotomy, small bowel resection, and Dobbhoff tube placement due to perforated small bowel. He was started on TPN that was slowly weaned to tube feeding. He was discharged home on POD 16 in stable condition.

**Conclusion:**SADI-S may cause severe malnutrition that requires a conversion. Robotic conversion of SADI-S to mini gastric bypass was feasible in this patient.

## A622

### **Robotic Conversion of Gastric Banding to Biliopancreatic Diversion with Duodenal Switch**

Rena Moon *Orlando FL*<sup>1</sup>, Jameson Wier *Orlando FL*<sup>1</sup>, Andre Teixeira *Orlando FL*<sup>1</sup>, Muhammad Jawad *Orlando FL*<sup>1</sup>

Orlando Regional Medical Center<sup>1</sup>

**Introduction:** Patient is a 39 year-old male who underwent a gastric band placement 10 years prior to presentation. He initially lost 157 pounds but regained all the weight and more. He also developed reflux. Due to his BMI of 64.4 and multiple comorbidities, the recommendation was made for band removal and conversion to duodenal switch.

**Materials and Methods:** The adhesions between the liver and the band were taken down. The tubing and buckle were cut, and the band was removed. The duodenum was dissected to create a window about 1 inch from the pylorus. The fundus of the stomach was fully mobilized, and the gastroesophageal junction was dissected. Using a 40 French tube, the sleeve was created and the duodenum was transected about 1 inch from the pylorus. The previously marked loop of ileum was brought to the proximal duodenum, and a two layer hand-sewn anastomosis was performed. The biliary limb was transected from the loop. The bowel was then counted backward for 125 cm. Stay sutures were placed, enterotomies made, and the bowel anastomosed with a linear stapler.

**Result:** On POD#2, he underwent a methylene blue test which demonstrated no leak. He was started on a liquid diet and discharged home the following day. At his one month follow up, he

was doing well without reflux. He lost 48 pounds since the surgery.

**Conclusion:** Robotic assisted is a feasible approach for simultaneous removal of gastric band and conversion to duodenal switch in appropriately selected patients.

## **A623**

### **Laparoscopic Hiatal Hernia Repair with Mesh in a Sleeve Patient for Recurrent Reflux**

Rena Moon *Orlando FL*<sup>1</sup>, Andre Teixeira *Orlando FL*<sup>1</sup>, Muhammad Jawad *Orlando FL*<sup>1</sup>  
Orlando Regional Medical Center<sup>1</sup>

#### **Introduction**

74-year-old female with a history of sleeve gastrectomy with hiatal hernia repair 5 years ago presented complaining of severe reflux. Patient had successful weight loss but developed recurrence of her severe reflux and hiatal hernia. She underwent hiatal hernia repair with anterior fundoplication 6 months ago to no avail.

#### **Materials and Methods**

Adhesion between the liver and sleeve stomach were taken down. A recurrence of the large hiatal hernia was noted. Adhesions between the sleeve and the peritoneum were dissected completely. The hernia sac was dissected all the way up cephalad close to the carina. The hernia sac was pulled down and the vagus nerve was identified and protected. Approximately 3 cm of esophagus was brought into the abdomen and this time was completely tension free. The hiatal hernia was completely reduced and the hiatus was approximated with 2 figure-of-eights. A BIO-A Gore 7 cm x 10 cm mesh was placed at the hiatus and secured in place with 2 stitches superiorly on each side of the hiatus with 2-0 silk and another suture was placed at the hiatus at the V to secure the mesh in place.

#### **Result:**

Upper gastrointestinal testing was negative on postoperative day(POD) 1, and the patient went home on POD 3 on phase 1 diet.

#### **Conclusion:**

The laparoscopic revision of failed hiatal hernia repair in a patient with a previous hiatal hernia repair and sleeve gastrectomy is better accomplished with full tension free esophageal dissection and mesh placement.

## **A624**

### **Laparoscopic Conversion of Non-Divided Gastric Bypass to Sleeve Gastrectomy due to Weight Regain**

Rena Moon *Orlando FL*<sup>1</sup>, Muhammad Ghenem <sup>1</sup>, Andre Teixeira <sup>1</sup>, Muhammad Jawad *Orlando FL*<sup>1</sup>  
Orlando Regional Medical Center<sup>1</sup>

**Introduction:** The world of bariatric surgery is constantly changing and evolving, and a procedure that is popular can be abandoned in a few years due to long term data suggesting a high failure rate. Modern bariatric surgeons however, are constantly faced with the challenge of



operating patients with failures of those historic procedures.

Non-divided gastric bypass is a procedure in which a pouch is done by stapling but not dividing through the stomach, and then performing a gastrojejunostomy. It was abandoned due to the high failure rate, commonly secondary to the dehiscence of the staple line between the pouch and the remnant.

**Methods and Results:** The case shown is that of a 59-year-old female patient who had a non-divided gastric bypass in the past and presented with weight regain. Preoperative EGD revealed dehiscence of the staple line between the remnant and the pouch, along with a narrowed gastrojejunostomy. She was revised to a sleeve gastrectomy. The operative course was uneventful. An UGI done at POD 1 was normal and she was discharged home in a good condition.

**Conclusion:** Non-divided gastric bypass can be safely converted a sleeve gastrectomy. Preoperative EGD is imperative to understanding the anatomy and causes of failure.

## A625

### **Internal hernia after gastric bypass: 2 difficult cases with operative pearls - Part 1**

Benjamin Clapp *El Paso TX*<sup>1</sup>, Isaac Lee *El Paso TX*<sup>2</sup>, Michael Cutshall *El Paso TX*<sup>2</sup>, Brittany Harper *El Paso TX*<sup>2</sup>

Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Background:** Internal hernias (IH) are a common complication after gastric bypass (GB). They can occur in 1-15% of patients and can happen at anytime after surgery. They can be life threatening and present acutely or chronic and present with vague symptoms. The treatment in all cases is surgical.

**Description of video:** This video highlights the laparoscopic approach to IH and technical tips that are helpful for reducing and treating these dangerous events. We use 2 patients to illustrate the basic surgical techniques. The first patient presented with IH 3 years after a sleeve gastrectomy conversion to GB. The emergency general surgeon did not recognize the IH on computed tomography (CT). Trocar placement is discussed, as is starting at the terminal ileum and moving proximally. The complex part of this case was pouch rotation. The second case was a GB patient 14 years after surgery with complete incarceration of almost the entire small bowel. The patient also had chylous ascites. There are 2 preoperative CTs that the emergency general surgeon ordered that show progression of her obstruction. Operative treatment is shown and tips on how to reduce a difficult IH are highlighted.

**Conclusions:** IH is a life threatening emergency that continues to be missed by other physicians and surgeons. The surgeon must have a high index of suspicion and a low threshold to operate. The astute surgeon knows that abdominal pain in a GB patients should equal operative exploration. The only treatment for IH remains surgical reduction and repair.

## A626

### **Hiatal hernia repair 14 years after gastric bypass with implantation of bioabsorbable mesh**

Benjamin Clapp *El Paso TX*<sup>1</sup>, Isaac Lee *El Paso TX*<sup>2</sup>, Michael Cutshall *El Paso TX*<sup>2</sup>

Benjamin Clapp MD PA<sup>1</sup> Texas Tech HSC Paul Foster School of Med<sup>2</sup>

**Introduction:** Gastric bypasses (GB) can have late complications. One of these complications is hiatal hernia with pouch migration into the mediastinum. This can cause dysphagia, reflux and even aspiration. Bariatric surgeons need to be aware of this problem, how to diagnose it, and how to treat it.

**Description of video:** This video highlights the case of a patient who underwent a laparoscopic GB in 2004. She maintained about a 45 kg weight loss but over the last 2 years had developed progressively worse symptoms of dysphagia and reflux. She was referred to our center and upper gastrointestinal series and computed tomography revealed intra-thoracic pouch migration. The video shows the images and the operative approach. Standard trocar placement for bariatric/foregut surgery is used. The pouch is dissected out of the mediastinum and adequate intra-abdominal esophageal length is obtained. The diaphragm is closed with a posterior cruroplasty and a piece of bioabsorbable mesh is used as reinforcement. Post operative images are shown.

**Conclusion:** Intra-thoracic pouch migration is a rare complication after GB. When it is symptomatic, it must be treated surgically. This can be done with a formal gastroesophageal dissection, cruroplasty and mesh reinforcement can be considered.

## A627

### **Converting Old Procedures . Conversion of a Failed Vertical-Banded Gastroplasty to a Vertical Sleeve Gastrectomy**

Jaime Ramos-Kelly *Tijuana*

HOSPITAL ANGELES TIJUANA

54 years old female from Calgary Alberta Canada who had a Vertical Banded Gastroplasty (VBG) in 2002 in Canada ; in 2011 she requested me a revision from VBG to a gastric band due to weight regain with modest results and ultimately regaining all her weight back and developing gastro-esophageal reflux ,GERD) she came back for a second revision in 2018 requesting a laparoscopic sleeve gastrectomy (LSG).

Her initial BMI was 42 with two major co-morbidities diabetes mellitus (DMII) and high blood pressure (HBP)that went under remission with the primary surgery ; but due to de novo GERD and weight regain due to a band revision she requested a second revision / conversion procedure . The LSG was technically difficult to perform but we managed to complete the conversion with great success , the patient lost all the excess body weight and GERD went into remission with great improvement in her quality of life.

**A628**

**Roux-en Y Fistulojejunostomy will be a best option for refractory post-sleeve gastric leak ;Video report and literature review**

Yong Jin Kim *Seoul*

LHK Bariatric and Metabolic Surgery Hospital

**Background:** Laparoscopic sleeve gastrectomy became the most common procedure during the last few years, due to its simplicity and efficacy compared to gastric bypass. However, complications related to the gastric staple line can be even more serious. In case of refractory chronic fistula, definite surgical option such as total gastrectomy or Roux-en Y

fistulojejunostomy(RYFJ) might be considered. Although RYFJ has been done in a limited case, the procedure showed very promising results with good success rate and minimal invasiveness. **Method:** We did RYFJ for late developed and refractory leak case. She presented fever and left shoulder pain after one and half year of sleeve gastrectomy. After failed two-month supportive management, we tried laparoscopic exploration. And we did systematic review with keyword such as sleeve gastrectomy, leak, surgical treatment, fistula, and so on.

**Result:** RYFJ was done by laparoscopically. She recovered well and discharged on postoperative 7 days without any event. With systematic review, we found 7 relevant articles(6 case report + 1 original study) from 2007 to 2017. Although open conversion was needed in some cases, all cases were successfully managed by RYFJ.

**Conclusion:** RYFJ in our case was efficient. From our experience and literature review, RYFJ for treating refractory post-sleeve gastric leak will be a good option with low surgical morbidity.

**A629**

**Laparoscopic Roux-En-Y Gastric Bypass and Repair of Type III Paraesophageal Hernia with Biosynthetic Mesh Reinforcement**

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Allegheny Health Network<sup>1</sup>

**Background:** Morbid obesity is associated with an increased rate of hiatal and paraesophageal hernias (PEH). Concomitant repair at the time of Roux-En-Y gastric bypass is technically feasible, safe, and lowers recurrence rates; however, the ideal operative management remains controversial. The use of reinforcing mesh may further lower recurrence rates in the bariatric patient population.

**Case Summary:** The patient is a 49 year-old female with a history of morbid obesity (BMI 42) and long-standing reflux with dysphagia. Preoperative endoscopy was notable for esophagitis and a moderate-sized PEH. Esophageal manometry revealed impaired esophageal motility with incomplete relaxation of the lower esophageal sphincter. Due to the patient's significant reflux symptoms, a laparoscopic Roux-En-Y gastric bypass and PEH repair with mesh was recommended. This video demonstrates the techniques utilized.

**Procedure:** The procedure began with creation of the biliopancreatic and Roux limbs with an end-to-side jejunojunctionostomy. A type III paraesophageal hernia was identified after

advancement of the Roux limb toward the stomach. The PEH was circumferentially mobilized and reduced. A 2 cm intra-abdominal esophagus was achieved without disruption of the peritoneum overlying the crura. A retroesophageal window was created and the hernia sac was excised. The gastric pouch was then created, followed by completion of a gastrojejunostomy. The PEH repair was then undertaken with primary approximation of the crura and reinforcement with an onlay biosynthetic mesh.

**Outcome:** The patient's postoperative course was uneventful and at one month post-op, the patient's weight loss totalled 23 lbs with resolution of reflux and dysphagia symptoms.

### **A630**

#### **Revisional Surgery: Robotic One Anastomosis Gastric Bypass Due to Stenosis After Sleeve Gastrectomy**

Mahir Ozmen *ANKARA*<sup>1</sup>, Cem Guldogan *Istanbul*<sup>1</sup>, Emre Gundogdu *Ankara*<sup>1</sup>  
Istinye University Medical School<sup>1</sup>

We present a 56 years old lady with body mass index (BMI) of 34 kg/m<sup>2</sup> who had laparoscopic sleeve gastrectomy three years ago and lost 58kg after surgery. However, she was admitted to the hospital with severe reflux symptoms, nausea, vomiting, epigastric pain and early satiety. Gastroscopy was performed, which revealed severe stenosis due to rotation at corpus just above incisura angularis and also 3cm hiatal hernia. She underwent balloon dilatation. However there was no relief on symptoms and we admitted her to the hospital two weeks later for surgery. We performed robotic one anastomosis gastric bypass(OAGB/MGB) due to severe stenosis after sleeve gastrectomy using da Vinci Xi. Postoperative course was uneventful with normal radiologic leak-test on post operative day two. She was discharged from the hospital on day three. She had no complain and lost some more weight during the follow up period of six months.

### **A631**

#### **Completion Gastrectomy After Multiple Foregut Interventions**

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Duke University<sup>1</sup>

With a growing number of people with obesity worldwide, bariatric surgery has become increasingly popular. Revisional surgeries due to failure or complications from primary procedures have increased as well. These procedures present a technical challenge due to existing scarring and adhesions. Although some complications can be managed endoscopically, surgery might be the only definitive solution. Completion gastrectomy with esophagojejunostomy reconstruction is a viable treatment option.

We present the case of a 50-year-old man with multiple obesity related co-morbidities, and a vast

surgical history including a Roux-en-Y gastric bypass, 2 hiatal hernia repairs, and a fundoplication. He presents with chronic PO intolerance due to intractable nausea and vomiting. Attempts to feed through a gastrostomy tube were unsuccessful and became dependent on TPN supplementation. He underwent multiple endoscopic procedures with no symptom resolution. The plan was made for completion gastrectomy with esophagojejunostomy reconstruction and jejunostomy tube placement for nutritional supplementation.

The surgery was performed without complications. The postoperative course was uneventful. An upper gastrointestinal series demonstrated a patent esophagojejunostomy anastomosis. By postoperative-day 7 the patient tolerated clear feeds and protein shakes and was discharged. At 30 days follow up the patient reports improved oral tolerance, including some solid foods. The plan was made to remove the jejunostomy tube in 4-6 weeks, depending on diet progression.

The increase in the number of bariatric surgeries has increased the number of complication related interventions. Completion gastrectomy with EJ reconstruction is a viable treatment option and should be considered in patients with refractory symptoms.

## **A632**

### **Hidden-incision Laparoscopic Sleeve Gastrectomy (HILSG)**

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Beijing Friendship Hospital<sup>1</sup>

Clinical Presentation and Indications for Surgery 23 years old, female, Body weight gradually increased over the past five years and failed to lose weight many times; Height 1.69 m, weight 122.67 kg, waist 111cm, BMI 42.95 kg/m<sup>2</sup> ; Comorbidities: Impaired glucose tolerance (IGT), Nonalcoholic fatty liver disease (NAFLD) , Hyperuricemia Preoperative Examinations HGB 120 g/L ALB 40 g/L; ALT 80 U/L ; AST 68 U/L UA 460 umol/L 2h PG 8.31 mmol/L BUS: fatty liver MRI: fatty liver, LFF 24% Endoscopy: chronic superficial gastritis, gastric polyp We performed HILSG for the patient. Total weight loss : 15kg at 1-month follow-up. No bleeding, no leak or other surgical complications. The incision healed well.

## **A633**

### **Conversion of Laparoscopic Gastric Band to Single Anastomosis Duodenal Switch**

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Introduction: Patients with recidivism following Laparoscopic adjustable gastric band (LAGB) is a challenging and ever-increasing issue. Conversion to Single anastomosis duodenal switch (SADSP) maybe the answer.

Case: 59 years old Male with CAD, Type 2 DM, HTN, who underwent LAGB in 2015, weight 145Kg BMI 46, Current weight 136Kg, BMI 43. Elected to undergo LAGB conversion to SADS.

Methods: The band is used to guide the dissection at the lesser curvature. Band is left in place till the dissection is completed, lesser sac is opened to take the pseudocapsule off the diaphragm, the lateral plication is taken down and the band is removed.

Dissection along the great curvature is carried 3 cm post pyloric and the duodenum is divided. Sleeve gastrectomy performed around 42F bougie. 300cm of small bowel proximal to the ileocecal valve is anastomosed to postpyloric duodenum, Methylene blue used to test the anastomosis.

Post op: Discharged on day 1 with no complication, lost 23Kg after 3 months and have 1-2 Bowel movements a day.

Conclusion:

LAGB conversion to SADS is a safe and effective solution for weight gain after LAGB

#### **A634**

##### **Revisional surgery from RYGB to sleeve gastrectomy plus JJB and hiatus hernia repair**

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First Affiliated Hospital of Jinan Univ<sup>1</sup> First Affiliated Hospital of Jinan Univ,<sup>2</sup> First Affiliated Hospital of Jinan Univ.<sup>3</sup>

Background: Mild Dumping syndrome is common but severe dumping syndrome is rare and needs revisional surgery after Roux-en-Y gastric bypass(RYGB). Objectives: To report a case of revisional surgery from RYGB to sleeve gastrectomy plus JJB and hiatal hernia due to dumping syndrome. Methods: A female patients got severe dumping syndrome symptoms three years after RYGB, and after one year of conservative treatment including diet habit changes and medication, no improvement occurred. We performed revisional surgery from RYGB to sleeve gastrectomy plus JJB and hiatus hernia repair. Results: Two years and 6 months after revisional surgery, the patient got mild weight loss and steady T2DM control, and with mild GERD symptoms. Dumping syndrome was cured. Conclusion: Revisional surgery from RYGB to sleeve gastrectomy plus JJB and hiatus hernia repair is effective, and bigger volume of cases study are needed.

#### **A635**

##### **RYGB as a rescue operation for gastrocolic and gastrohepatic fistula after sleeve gastrectomy**

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St. Mary's Hospital, London<sup>1</sup>

### Introduction:

Laparoscopic sleeve gastrectomy (LSG) is the most frequent bariatric operation performed worldwide. Staple-line leaks post LSG are highly challenging to treat and chronic complications such as a gastrocolic fistula are rare and require a highly skilled approach

### Objectives:

We present a case report video of laparoscopic management of a gastrocolic fistula and gastro-hepatic fistula post-LSG leak.

### Methods:

A 34-year-old lady presented with a history of ongoing left shoulder pain post Sleeve Gastrectomy done 3 years ago. The patient was suffering from Struggling to keep weight, constant fatigue, Significant Lt side shoulder tip pain and difficulty in oral intake. A revision was done to RYGB after separation of both gastro-hepatic and gastro-colic fistulae and excision of the unhealthy part of the stomach then performing classic ante-colic Roux-en-Y gastric bypass

### Results:

Post-operative course was uneventful and the patient was discharged home POD 4. All preoperative symptoms resolved at 1 month follow up.

### Conclusion:

This is a case report of a gastrocolic fistula post sleeve gastrectomy which is a rare late postoperative complication that needs a high level of clinical suspicion and very careful surgical approach. Separation of the fistula and excision of the diseased part are considered the main pillars for the success of the operation.

## **A636**

### **Revision for severe malnutrition after gastric bypass with Bilroth II reconstruction**

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the Affiliated Hospital of Xuzhou Medic

Background: Gastric bypass with bilroth II reconstruction plus braun anastomosis is an effective treatment for diabetes and obesity. However, the procedure is invasive and often prone to severe postoperative complication. We describe a cases of persistant vomiting and severe mal-nutrition (BMI 19.5) as a result of extreme distalization of the braun anastomosis. Method: A 28 years old female underwent revision surgery for severe malnutrition as a result of a bilroth II gastric bypass with braun anastomosis. The revision involved the take-down of the Braun anastomosis

and the placement of trans-nasal feeding tube. Before the revision, the patient was fed parenterally for 10 days. Results: Operative findings were severe intra-abdominal adhesion and the braun anastomosis constructed between the afferent and efferent limb at 20 cm and 50 cm distal to the gastrointestinal anastomosis and proximal to the ileocecal junction respectively. The afferent limb was 220cm while the efferent limb was 270 cm. Following adhesiolysis and take-down of the braun anastomosis, the patient had prompt return of bowel function without recurrence of vomiting. The patient was discharge three day following the revision surgery with a significantly improved nutritional status (Albumin: 22.1, HGB:) the overall hospital stay was 16 days. Conclusions: Malnutrition induced by the extreme distalization of the braun anastomosis was successfully reverted by deconstructing the braun anastomosis.

### **A637**

#### **Magnetic Sphincter Augmentation for Treatment of Gastroesophageal Reflux Disease after Roux-En-Y Gastric Bypass**

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Clinic Beau Site<sup>1</sup> Clinica Beau-Site<sup>2</sup>

**Introduction:** Magnetic sphincter augmentation (MSA) has been shown to be an effective treatment option for gastroesophageal reflux disease (GERD). However, its efficacy in subgroups such as post-bariatric surgery patients has yet to be determined.

**Case:** We present a video of a 42-year old female who underwent laparoscopic MSA placement for the treatment of GERD after prior Roux-en-Y gastric bypass (RYGB) for morbid obesity. The patient had an initial body mass index of 35.8 kg/m<sup>2</sup> and underwent a RYGB in 2006. She developed dumping syndrome treated with sclerotherapy of the gastro-jejunal anastomosis in 2009. The patient also had chronic GERD refractory to high-dose proton pump inhibitor (PPI) therapy and suffered from nocturnal cough, regurgitation, and heartburn. Pre-operative studies showed a 2 cm hiatal hernia as well as a dilated gastro-jejunal anastomosis. This video reviews the trocar placement, dissection of prior RYGB, sizing of the MSA device, and proper placement of the MSA device. The patient tolerated the procedure without any issues, had no 30-day complications, and had complete symptom resolution without PPI use at 3 months' follow-up.

#### **Conclusion:**

Our video demonstrates the technique of successful MSA device placement in a patient with persistent GERD after RYGB.

### **A638**

#### **Laparoscopic Conversion from Gastric Sleeve to Roux-en-Y Gastric Bypass with Remnant Gastrectomy using Fluorescent Angiography**

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**Introduction:** Conversion from gastric sleeve to Roux-en-Y gastric bypass (RYGB) is often performed for patients with insufficient weight loss. We present a unique case in which a patient had additionally severe gastritis on endoscopy, making resection of the remnant stomach necessary during conversion to RYGB. We also demonstrate the use of a fluorescent angiography technique to assess perfusion of the staple lines.

**Case:** This is a 57-year old female with history of chronic gastritis type C. She had a prior sleeve gastrectomy in 2015 for treatment of morbid obesity, with initial BMI of 39.2. Due to severe reflux, insufficient weight loss, and persistent severe gastritis, the patient was consented for conversion to RYGB with gastrectomy. This video shows the dissection technique of the prior sleeve, the creation of the gastric pouch, remnant gastrectomy, and Roux-en-Y reconstruction. The video also demonstrates how intraoperative fluorescent angiography is used to assess the perfusion of the staple lines. The patient tolerated the procedure well without any 30-day complications, and was asymptomatic at 1-month follow-up.

**Conclusion:** Our video demonstrates the technique of successful conversion of sleeve to RYGB with remnant gastrectomy, and the use of intraoperative fluorescent angiography.

## A639

### **Salvaging sleeve staple line after removal of an incorporated temperature probe**

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Montefiore Medical Center<sup>1</sup> Jacobi Medical Center<sup>2</sup>

**Introduction:** Stapling of a bougie, temperature probe, or a nasogastric tube is a rare and poorly reported complication of bariatric surgery that can lead to significant morbidity in patients. The best management of such a complication is unclear.

**Case description:** Patient is a 55-year-old gentleman with a BMI 35 kg/m<sup>2</sup>, hypertension, type 2 diabetes mellitus and obstructive sleep apnea. Patient underwent a laparoscopic sleeve gastrectomy using a 34Fr Bougie. At the end of the case, attention was brought to the fact that the tip of the oral temperature probe was missing. The specimen was examined and revealed the tip within the resected stomach. The staple line was inspected and revealed a defect with a small amount of adherent clot. There was found to be a loose staple, which was removed. The defect was repaired primarily with a Figure-of-eight suture and imbricated with Lembert sutures. Care was taken to avoid excessive narrowing of the stomach. An intraoperative leak test and esophagogastroduodenoscopy were performed to confirm that there was no leak. An upper GI study on post-operative day one revealed no leak. Patient was started on a clear liquid diet and discharged on post-operative day 2. On 30-day follow up, patient was tolerating a puree diet without dysphagia with a total weight loss of 21 lbs and resolution of hypertension and diabetes.

**Conclusion:** Staple line defect from accidental stapling of a temperature probe can be repaired primarily without re-stapling to avoid narrowing the stomach lumen.

## **A640**

### **Unusual Type of internal hernia after gastric bypass MD. Saif Al-Tai at Torsby hospital**

Saif Al-Tai *Torsby*

Torsby hospital

#### Introduction

Internal herniation (IH) through the mesenteric defects is a well-known problem after gastric bypass. Most commonly is the biliopancreatic limb herniating through Peterson space from left to right direction. A less common herniation of alimentary limb and common channel favor right to left direction and can be confusing. We would like to share our experience of a patient with last-mentioned type of herniation.

#### Method

69 years old female underwent gastric bypass 2009. Since 2016, the patient has experienced problem with heartburn, abdominal pain and vomiting.

EGD study was normal. Esophageal manometry and 24-hour pH monitoring was normal. Barium swallow showed Hiatal hernia and short stagnation of barium above the gastroesophageal junction. A decision was made to proceed with laparoscopy.

#### Result

At laparoscopy, a large hiatal hernia was found. A rotation of the intestine at the gastrojejunostomy and intestinal mesentery at the enteroenterostomy was observed. A single intestinal loop was herniating through Peterson space. We failed to follow the biliopancreatic limb, common channel and the ileum backward from the cecum because the limbs disappear at some point behind the remaining small intestine.

The situation was confusing, and it took a while to realize that most of small intestine was herniating through Peterson space from right to left. The herniated intestine was reduced, and the defects was sutured. Patients symptom resolved after surgery.

#### Conclusion

The unusual direction of herniation after gastric bypass can be difficult to interpret especially in acute situation. Surgeon awareness of this variation facilitate solving the problem.

## **A641**

### **Less is More: Avoiding Conversion to RYGB with LINX placement after Sleeve Gastrectomy**

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University of California, San Diego<sup>1</sup> UC San Diego<sup>2</sup>

#### Introduction:

Laparoscopic sleeve gastrectomy (LSG) is a commonly performed bariatric procedure in obesity management. Gastroesophageal reflux disease (GERD) in this population has reported rates of 23-100% GERD after LSG . GERD after LSG has been noted with recent studies demonstrating

de novo reflux or symptom exacerbation despite weight loss. Fundoplication is not an option, and medically refractory GERD after LSG is usually treated with conversion to Roux-en-Y gastric bypass (RYGB). This video demonstrates the placement of a magnetic sphincter augmentation device after LSG as an alternative to conversion to RYGB.

Case:

The patient was a 34 year old male with a history of morbid obesity status post laparoscopic sleeve gastrectomy 1.5 years prior, his initial BMI prior to bariatric intervention was 44. He presented with symptoms of GERD, including nausea, heartburn, and regurgitation, not alleviated by twice daily PPI. Of note, he had successful weight loss post-sleeve, and at 14 months post-op had a BMI of 21, with 103% EWL. Upper GI swallow study showed severe reflux to the thoracic inlet, and pH testing showed DeMeester scores of 50 and 20. His case was discussed at an interdisciplinary conference between the Minimally Invasive Surgery group and gastroenterology and the decision was made to offer LINX placement for symptoms relief.

Conclusion:

Magnetic sphincter augmentation placement is a safe and effective treatment for medically refractory GERD in patients who have undergone sleeve gastrectomy, as an alternative to the traditional conversion to Roux-en-Y gastric bypass.

**A642**

**Conversion of Vertical Ringed Gastroplasty to Laparoscopic Gastric Bypass due to stenosis and severe reflux. Technical aspects of revisional surgery.**

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**BACKGROUND:** Vertical ringed gastroplasty (VRG) was described in the decade of 1980, its technical facility and relative low rate of complications in the short term, made it the procedure of choice for the time. However, it has been progressively abandoned, due to high failure rates, long-term complications and the need for revisional surgery.

**METHODS:** the aim of this video is to present the case of a 69-year-old female patient, with a history of a GVA 20 years ago, and long-term reflux and intolerance to solid foods clinic. The superior digestive radiological series showed a decrease in caliber between the fundus and the gastric body, in relation to the ring. Conversion was made to laparoscopic gastric bypass (LGBP), with biliopancreatic limb length of 100 cm, alimentary limb of 150 cm and common limb of 230 cm.

**RESULTS:** The course in the immediate postoperative period was favorable, with hospital discharge 72 hours after surgery and clinically correct evolution in the controls by external consultation.

**CONCLUSION:** the conversion of RVG to LGBP, although it is a technically demanding

procedure, is safe and feasible, with good results both in weight loss and in correction of complications associated with other techniques.

#### A643

##### **Laparoscopic reversal of Roux en Y Gastric bypass to original anatomy**

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**Background / introduction:** Gastric bypass is today the most frequently performed bariatric procedure[1] There will be more clinical cases with serious complications that require reversal, some centers have demonstrated success with reversal procedures for the treatment of metabolic derangements and symptoms.[2]

**Objective:** the aim of this video was to demonstrate the operative management of a laparoscopic reversal of Roux en Y Gastric bypass to original anatomy.

**Methods:** We present the case of a 62-year-old woman with BMI 33.56 kg/m<sup>2</sup> with Arterial hypertension, diabetes, bilateral gonarthrosis, who underwent laparoscopic Roux-en-Y Gastric bypass last October of 2018, 1 month postoperative patient refers nausea, vomiting and abdominal pain on left flank, received medical treatment without resolution of these symptoms; patient desires a reversal surgery, to solve this medical condition, patient underwent Laparoscopic reversal of Roux en Y Gastric bypass to original anatomy surgery last January 2019, with a follow-up of 3 months, without abdominal pain, nausea and vomiting.

**Results:** We present step by step the operative management of Laparoscopic reversal of Roux en Y Gastric bypass to original anatomy. Procedure includes block section of "Roux-en-Y", reconfiguration to original anatomy, with 3 basic anastomosis biliopancreatic limb with alimentary limb, alimentary limb with common channel and finally gastro-gastro anastomosis. (Pouch to excluded stomach)

**Conclusion:** A safe way to reversal of Roux en Y Gastric bypass to original anatomy we describe 3 basic anastomosis and block section of "Roux-en-Y" with linear-stapler and clear concept of modified limb configuration changed to "original anatomy".

#### A644

##### **Sleeve Gastrectomy in a challenging variant of situs inversus ambiguus**

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Jackson Medical Group<sup>1</sup> Jackson North Medical Center<sup>2</sup>

**Situs ambiguus occurs in every 4 per 1 million live births.<sup>1</sup> It differs from situs inversus with some internal structures in the proper orientation while others are inverted.<sup>2</sup> It is categorized by abnormal splenic morphology: polysplenia with left isomerism and asplenia with right isomerism.<sup>3</sup> Although most of those affected have no health issues, surgical**

intervention may present technical challenges.<sup>4</sup>

We present the case of a 24-year-old male with a BMI of 39.6 kg/m<sup>2</sup>, who was referred for bariatric surgery evaluation. His past medical history included asthma, dyslipidemia, obstructive sleep apnea, and impaired fasting glucose. Abdominal CT showed left-sided isomerism with right-sided polysplenia with the stomach located on the right with underlying mesenteric malrotation and hemiazygos continuation of a left-sided IVC. Diagnostic laparoscopy showed malrotation of abdominal organs with the liver and gallbladder in the normal anatomical position. Therefore, the operative field required cephalad retraction of the right lobe of the liver and gallbladder. Mobilization in the right side was challenging with multiple accessory spleens dissected off the fundus. Intraoperative leak test was negative, and upper GI series under fluoroscopy on postoperative day 1 showed no evidence of obstruction or extravasation of contrast. He was started on a liquid diet and was discharged in good medical condition.

#### A645

**Is gastric bypass still the redemption after consecutive, different, failed bariatric procedures? A video report of a complicated sleeve gastrectomy in a multiple operated patient.**

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UNIVERSITY LA SAPIENZA OF ROME<sup>1</sup>

**Introduction:** Laparoscopic sleeve gastrectomy (LSG) is the most performed bariatric procedure, but complications might interfere with long-term evolution based on patient's compliance and tolerance, surgical attitude and unpredictable evolution. **Materials:** we present the case of a female obese patient (BMI 37 kg/m<sup>2</sup>), with impaired type II diabetes mellitus and other comorbidities, with multiple, sequential bariatric minimally-invasive interventions: LSG in 2012 complicated by gastric dilation and later by mediogastric stenosis, treated with sequential endoscopic gastric dilations; reoperated for viscerolysis and cholecystectomy; converted in 2015 for food intolerance and weight regain to functional one anastomosis gastric bypass (200 cm limb), with a non-adjustable gastric ring positioned instead of stapled division of the sleeve. After initial good evolution for 12 months, patient started to suffer from persistent biliary gastro-esophageal reflux, chronic abdominal pain, and gas bloat syndrome. Conversion to laparoscopic R-en-Y gastric bypass was performed in 2018, with gastro-enteral anastomosis resection, band removal and viscerolysis. **Results:** After multiple surgical and endoscopic interventions, the patient presents short-term favorable outcomes, with no reflux or abdominal pain, with further weight loss (actual BMI 27) and diabetes improvement. **Conclusion:** bariatric surgery has unpredictable evolution in some cases, and conversion to R-en-Y seems to be the best solution.

#### A646

## **LAPAROSCOPIC HIATAL HERNIA REPAIR WITH A FUNDOPEXY IN A POST SLEEVE GASTRECTOMY PATIENT**

Vicente Cogollo *Weston FL*<sup>1</sup>, Juliana Henrique *Weston FL*<sup>1</sup>, Luis Felipe Okida *Weston FL*<sup>1</sup>, Maria Fonseca *Weston FL*<sup>1</sup>, Emanuele Lo Menzo *Weston FL*<sup>1</sup>, Samuel Szomstein *North Miami Beach FL*<sup>1</sup>, Raul Rosenthal *Weston FL*<sup>1</sup>  
Cleveland Clinic Florida<sup>1</sup>

**Introduction:** Gastric herniation following laparoscopic sleeve gastrectomy is a surgical complication presented in up to 37% of cases in some studies. The intrathoracic migration of the stomach can happen as early as 1 month after surgery.

**Methods:** We present a case of a 70 years old female who underwent sleeve gastrectomy in 2017 and 10 months later started with intermittent episodes of emesis without nausea. A CT scan of the chest showed a hiatal hernia and an upper GI series revealed a stricture at the herniated stomach with significant reflux into the esophagus. During surgery, a herniated and kinked stomach into the lower mediastinum was found. Once the herniated content was reduced, the hiatal defect was closed with barbed suture. Then, the fundus of the stomach was fixed to the left diaphragm crus.

**Results:** The patient tolerated the procedure well with minimal blood loss. The patient was discharged home on post-operative day 2. She remains asymptomatic at her follow up visit.

### **Conclusion:**

Gastric herniation is a complication that can occur in more than one third of cases after sleeve gastrectomy. Moreover 40% of these patients may present reflux symptoms and the hiatal hernia correction is then indicated. Laparoscopic repair is feasible and safe.

## **A647**

### **Robotic-assisted Roux-en-Y Gastric Bypass Reversal due to Dumping Syndrome and Severe Malnutrition**

Roberto Bustos *Chicago IL*<sup>1</sup>, Valentina Valle *Chicago IL*<sup>2</sup>, Gabriela Aguiluz *Chicago IL*<sup>2</sup>, Alberto Mangano *Chicago IL*<sup>2</sup>, Mario Masrur *Chicago IL*<sup>2</sup>  
University of Illinois at Chicago<sup>1</sup> UIC<sup>2</sup>

#### **Introduction**

Although Roux-en-Y gastric bypass is one of the most commonly performed procedures for morbidly obese patients, it carries the risk of potential complications such as dumping syndrome and severe malnutrition. In this situation, a gastric bypass reversal is a valid option, but always considering the risk of weight regain and return of comorbidities.

#### **Methods**

43-year-old female. History of Roux-en-Y gastric bypass 9 years prior. BMI 18 kg/m<sup>2</sup>. HPI: dumping syndrome, severe malnutrition with no clinical improvement despite proper medical and nutritional therapy.

## Results

A robotic-assisted reversal of Roux-en-Y gastric bypass was planned. An extensive adhesiolysis was required to gain access to the surgical site. Previous anastomoses were mobilized and taken down. Normal transit was restored creating 2 jejunostomies (using a laparoscopic linear stapler) and 1 gastro-gastrostomy (using a laparoscopic 28mm circular stapler).

## Conclusions

The robotic platform has a potential role in operations traditionally done open. Extensive adhesiolysis is possible using the robotic instruments and anastomosis can be created using robotic staplers, laparoscopic staplers, or hand-sewn if required.

## A648

### **A Novel Over-Under Technique for Managing Acute Sleeve Strictures Associated with Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy**

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Bariatric Medicine Institute<sup>1</sup> Bariatric Medical Institute<sup>2</sup>

A sleeve stricture is usually a delayed diagnosis; however, it can occur acutely. When this happens, the sleeve can be saved when using the over-under technique.

This is done by transecting the stomach at the stricture and pulling the superior portion over the lower portion and firing a 60-mm mechanical stapling device. The resulting defect is hand-sewn closed. This allows the patient to keep their pylorus and avoids the complications associated with conversion to Roux-en-Y gastric bypass.

There have been no previous reports of this technique which can be used to treat both acute and chronic strictures.

## A649

### **Mucosal-Sparing Closure of the Common Enterotomy at the Newly Created Jejunostomy Combined with a Modification of the Brolin Antiobstruction Stitch: Techniques to Prevent Small Bowel Obstruction of the Alimentary Limb in Laparoscopic Roux en-Y Gastric Bypass**

Charles Mitchell *Charleston SC*<sup>1</sup>, Bryan Thomas *Charleston SC*<sup>2</sup>  
Bon Secours St. Francis Hospital<sup>1</sup> Roper St. Francis Healthcare<sup>2</sup>

In 1994, Drs. Wittgrove and Clark reported the first case series of Laparoscopic Roux en-Y Gastric bypass. Several modifications of this original technique have been developed over the

last 25 years, including the path of the roux limb, the creation of the gastrojejunostomy, and the creation of the enteroenterostomy. Traditionally in our practice, we have performed the enteroenterostomy with a single firing of a linear stapler in a side-to-side fashion, and completed this anastomosis with a hand-sewn closure of the common enterotomy. We have avoided a stapled closure of this enterotomy in an effort to avoid multiple staple lines, which in our experience can promote a significant inflammatory reaction and can lead to adhesions which may contribute to the development of a small bowel obstruction of the alimentary limb. In our video abstract, we would like to share our technique which was developed to prevent small bowel obstruction secondary to the development of adhesions in relation to the exposed staple line of the biliopancreatic limb of the enteroenterostomy. Since employing this technique, we have prevented readmission and reoperation to correct this postoperative complication in over 200 consecutive patients.

## **A650**

### **EARLY DIAPHRAGMATIC HERNIATION OF SLEEVE GASTRECTOMY CAUSING DYSPHAGIA**

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Imperial College London<sup>1</sup> Imperial College NHS Trust<sup>2</sup>

#### **BACKGROUND**

Patients commonly complain of dysphagia following sleeve gastrectomy. Common causes for this include antral stunning, underlying medical conditions, narrowing of the gastric sleeve due to sharp angulation or spiralling and a reaction to anaesthesia.

#### **METHODS**

We present an unusual case of a 57-year-old lady with BMI of 37 who underwent a primary sleeve gastrectomy and hiatus hernia repair. The patient was well post-operatively and was discharged day 2 post op. However, she was re-admitted 2 weeks later with acute dysphagia to solids with vomiting.

#### **RESULTS**

We performed a barium meal which demonstrated a kinked narrowed proximal end of the sleeve with acute herniation into the chest. Laparoscopy revealed herniation of the proximal part of the sleeve above the diaphragm due to giving way of the anterior crural stitches. The sleeve was pulled back into the abdominal cavity and the intra-abdominal length of the esophagus was confirmed. The left and right crura were further approximated using sutures and the sleeve was anchored at the angle of His to the diaphragm. The patient's symptoms resolved and she was discharged safely.

#### **CONCLUSION**



Acute sleeve herniation should be considered as a cause of dysphagia post sleeve gastrectomy. Barium studies and early repeat laparoscopy are essential for managing this complication.

#### **A651**

##### **Laparoscopic BP-DS - Technique and modifications.**

Rana Pullatt *Mt Pleasant SC*

Medical University of South Carolina

Video demonstrating technical details of the BPD- DS and modifications in the super obese patient.

#### **A652**

##### **Revisional surgery for dumping syndrome after laparoscopic Roux-en-Y gastric bypass (LRYGB): is it laparoscopic sleeve gastrectomy (LSG) a solution?**

Shuwen Jiang *Guangzhou*<sup>1</sup>, Wah Yang *Guangzhou*<sup>1</sup>, Songhao Hu *Guangzhou*<sup>1</sup>, Cunchuan Wang *Guangzhou Guangdong*<sup>1</sup>

The First Affiliated Hospital of Jinan University<sup>1</sup>

##### **Abstract**

**Background:** Number of bariatric surgeries in China increased rapidly in the past few decades. Treatment for postoperative severe nutrition deficiencies also is in our concern, especially revisional surgery.

**Objectives:** We are presenting a case of revisional surgery converting LRYGB to LSG due to dumping syndrome.

**Methods:** A 31-year-old female with BMI 31 underwent LRYGB 4 years ago felt weak and dizzy in the past 2 years. Ahe was being worse after eating, even disturbance of consciousness. In this video, the small pouch was recovered by severing gastrojejunostomy. LSG was performed under the support of a 38Fr bougie with hand-sewn reinforcement . Length of alimentary limb and biliopancreatic limb were kept as it was.

**Results:** Dumping syndrome relieved and discharged one week after surgery. But the patient still complained of nausea and vomiting during 1one year follow-up. Taking proton pump inhibitor (PPI) was helpful to relieve these symptoms.

#### **A653**

##### **Revisional Surgery: from LAGB to MGB/OAGB**

Nunzio Velotti *Naples*<sup>1</sup>, Mario Musella *Napoli*<sup>1</sup>, Katia Di Lauro *Naples*<sup>1</sup>, Antonio Vitiello<sup>1</sup>,  
Giovanna Berardi<sup>1</sup>, Domenico Manzolino *Napoli*<sup>1</sup>  
University of Naples "Federico II"<sup>1</sup>

Here we present the case of a 43 years-old female patient who underwent one-step revisional procedure: LAGB removal and MGB/OAGB realization.

The patients had a pre-LAGB BMI of 40,1 kg/m<sup>2</sup>; one year after LAGB positioning, she reached a BMI of 28 kg/m<sup>2</sup> but after 5 years a BMI of 42,6 kg/m<sup>2</sup> was reached. For this reason, the patient was scheduled to receive an MGB/OAGB. Additionally, in the pre-operative evaluation, the patient was found to have a new-onset type 2 diabetes mellitus (HbA1c = 7,2%).

#### **A654**

##### **Internal Hernia after Laparoscopic Duodenal Switch**

Paul Enochs *Cary NC*<sup>1</sup>, Jaime Bull *RALEIGH NC*<sup>1</sup>  
WakeMed Bariatric Specialists of NC<sup>1</sup>

Video Abstract Submission: Internal hernia after Laparoscopic Duodenal Switch

#### **A655**

##### **Accidental Stapling of Temperature probe during Sleeve Gastrectomy**

Rana Pullatt *Mt Pleasant SC*<sup>1</sup>, Benjamin White *Charleston SC*<sup>1</sup>  
Medical University of South Carolina<sup>1</sup>

This Video demonstrates a case where accidental stapling of the temperature probe occurred during performance of a Laparoscopic Sleeve gastrectomy. The temp robe was released after sharp dissection and we closed the resulting gastrotomy in two layers and secured omentum over the repair. The patient has done well in the postoperative period.

While our institution and OR team has a long-standing policy of no placement of esophageal temperature probes, or naso- or orogastric tubes during any bariatric or foregut case that will require stapling. In this particular case, the anesthesia resident was a CA-1, and this happened to be his first GI surgery case. Since this case we have instituted an education program for anesthesia residents and nurse anesthetists, and have started an intraoperative "time out" prior to stapling that ensures there is nothing in the esophagus that we are not aware of.

#### **A656**

##### **Chemical Pyloroplasty During Sleeve Gastrectomy: Technique and Outcomes**

Jessica Zaman *Albany NY*<sup>1</sup>, Tyler Robinson<sup>1</sup>, tejinder Singh<sup>1</sup>, Vladimir Davidyuk<sup>1</sup>  
Albany Medical Center<sup>1</sup>

**INTRODUCTION:** Post-operative nausea and vomiting (PONV) is common after laparoscopic SG. We present a novel technique of anterior CP during laparoscopic SG that improves PONV.

**METHODS and PROCEDURES:** SG is performed laparoscopically or robotically based on surgeon preference. SG is performed over a 36-40 Fr bougie is inserted using buttressed staples. CP is performed using 100 U of botulinum toxin suspended in 10cc of saline. The injection is performed using a reusable aspiration needle into the anterior aspect of the pylorus. A completion upper endoscopy is performed as a leak test and to confirm a patent pylorus. The post-operative management includes initiation of liquids by mouth on post-operative day 0 and discharge home when the patient tolerates approximately 2L of fluids by mouth per day.

**RESULTS:** A prior retrospective analysis of 568 patients undergoing SG by three operative surgeons was performed, demonstrating that there is a statistically significant decrease in length of stay in patients receiving CP (2.65 vs.3.46 days). There was no statistically significant difference in intra-operative or 30-day peri-operative complications. The patient presented in this video was discharged on post-operative day 1 and had no 30-day post-operative complications.

**DISCUSSION:** Increased intra-gastric pressure after SG places a force on the staple-line. CP with botulinum toxin reduces intra-gastric pressure by improving gastric emptying and may in turn reduce PONV and improve perioperative outcomes.

**CONCLUSIONS:** CP can be performed safely and effectively during laparoscopic SG. A randomized controlled trial is currently ongoing at our institution.

## **A657**

### **Systematic Training in Bariatric Surgery. Video Presentation.**

Lars Seeberg *Tolvsrød*  
Vestfold Hospital Trust

### **Systematic Training in Bariatric Surgery. Video Presentation.**

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<sup>2</sup>*Morbid Obesity Center, Vestfold Hospital Trust, Norway*

### **Introduction**

Bariatric surgery was introduced at Vestfold Hospital Trust in 2004 and over 2,500 patients have been operated. The procedures have been performed by experienced surgeons and junior doctors specializing in gastrointestinal surgery. Our experience is that these candidates have benefited greatly from this training, and that this has not affected the quality of surgery.

### **Material**

During the last years we have systematically trained our junior doctors. The goal of the training

was that each candidate within six months would be competent in suturing the jejunojejunostomy. We filmed every procedure and recorded time consumption.

### **Result**

The first candidate improved all measured performances during those six months, and the operating time was reduced from 20 to 8 minutes in performing the jejunojejunostomy. There were no complications during the training period.

### **Conclusion**

Targeted and structured training of junior doctors can be safely performed in bariatric surgery. Video documentation is suitable as a training tool. The skill set acquired are very valuable for further laparoscopic training.

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### **A658**

#### **Laparoscopic re-sleeve gastrectomy as a treatment of weight regain after Open Duodenal Switch. (DS)**

Sergio Sanchez-Cordero *Igualada*<sup>1</sup>, Renato Roriz *Barcelona*<sup>2</sup>, Ariel Almanza *Barcelona*<sup>3</sup>, Yuhamy Curbelo *Vic*<sup>4</sup>, Ramon Viallonga<sup>5</sup>

Consorti Sanitari d'Igualada<sup>1</sup> Hospital de Base of Porto Velho - Brazil<sup>2</sup> Centro médico Teknon<sup>3</sup> Consorti Sanitari de Vic<sup>4</sup> Quirobes. Integral Obesity Care<sup>5</sup>

Patient suffering from morbid obesity underwent a laparoscopic band placement and after an open duodenal switch (DS) with BMI 45 and underwent BMI= 33 Kg/m<sup>2</sup> with severe GERD. We aim to show in that video, technical aspects regarding the laparoscopic re-sleeve gastrectomy when we observed progressive weight regain and persistence of comorbidities associated with evidence of dilated gastric fundus and/or antrum on upper gastro-intestinal series.

We aim to show the intraabdominal dissection of the previous adhesions, sleeve gastrectomy and of the upper part of the sleeve gastrectomy, including an enlarged fundus. A complete hiatal dissection was performed including closure of the hiatus and pillars.

Complete transection of the dissected sleeve was done over a 40 Fch bougie.

Patient after 15 days, developed a functional stenosis that required an endoscopic dilatation.

Although surgical management is complex during revisional surgeries and complications (intraoperative and postoperative) may occur, we need to consider re-sleeve gastrectomy in patients after DS.

Laparoscopic re-sleeve gastrectomy is a feasible and effective intervention to correct weight regain after DS.

### **A659**

#### **Revisional surgery for early gastric leak after Roux-en-Y gastric bypass (RYGB)**

Sergio Sanchez-Cordero *Igualada*<sup>1</sup>, Ramon Villlonga *Barcelona*<sup>2</sup>, Plero Alberti *Barcelona*<sup>2</sup>, Amador Garcia Ruiz de Gordejuela *Barcelona*<sup>2</sup>, Enric Caubet *Barcelona*<sup>2</sup>, Oscar Gonzalez *Barcelona*<sup>2</sup>, Marc Perez *Barcelona*<sup>2</sup>, Rocio Martin *Barcelona*<sup>2</sup>, José Manuel Fort *Barcelona*<sup>2</sup>  
Consorci Sanitari d'Igualada<sup>1</sup> Hospital Vall Hebron<sup>2</sup>

#### Background:

Gastric leak occurs in 1-6% of patients who undergo Roux-en Y gastric bypass (RYGB) for morbid obesity. The pathophysiology may be related to gastric ischemia, fistula, or ulcer. Gastric leak is a severe complication of gastric bypass (GBP) that is associated with significant morbidity and mortality. Fistula may have several clinical impacts, depending on patient-related factors, fistula characteristics, onset time, and therapy proposal. Abdominal drainage, gastrostomy, and revisional surgery constitute the traditional approaches to dehiscence and fistula closure, with variable results.

#### Methods:

We present a video of a clinical case of 44-year-old lady with body mass index of 45Kg/m<sup>2</sup> who underwent Roux-en-Y gastric bypass and 48 hours later presented tachycardia and right quadrant pain. The CT scan informed of an apical leak at the gastric pouch level. The video shows the relevant aspects of a revisional surgery and the key points to drain the fistula and close the defect laparoscopically.

#### Results

After 6 months, the patient achieved successful results, defined as a stable clinical situation with image evidence of gastric fistula remission.

#### Conclusions:

Gastric bypass (GBP) is one of the most efficient bariatric interventions in morbidly obese patients. The most severe risk of this procedure seems to be the staple line leak, and the management of this complication can be very arduous. Without any guidelines it is very difficult to determine the right procedure addressing the staple line leak after GBP.

#### **A660**

#### **GASTRIC SLEEVE IN PATIENT WITH GIANT GASTRIC DIVERTICULUM**

Pablo Omelanczuk *Guaymallen*

Clinica Quirúrgica S A

**INTRODUCTION:** We present a 69-year-old female patient with morbid obesity antecedent, BMI 44 and gastric diverticulum diagnosed by endoscopy. Due to this diagnosis a sleeve gastrectomy was decided.

**CONTENTS DESCRIPTION:** Patient in dorsal decubitus in the French position, under general anesthesia with compression stockings. Patient fixation. Access to abdominal cavity, semiology it was observed stomach with gastric fundus diverticulum. Harmonic

scalpel section of left gastrophrenic ligament with localization of left pillar. Pars flaccida section and right pillar dissection. Sleeve gastrectomy using 5 60-mm Echelon cartridges for mechanical suture. Continuous invaginating suture stitches with PDS 3.0. Hemostasis control. Bed drainage. Stomach extraction through paraumbilical trocar. Access closure.

**OBSERVATIONS AND/OR COMMENTS:** Patient with favorable evolution. Medical discharge: 48hs. It was decided to present this case since gastric diverticulum in a morbidly obese patient submitted for Gastric Sleeve is not a frequent finding.

**A661**

### **Laparoscopic Resection of Jejunojejunal intussusception and Revision of Jejunojejunostomy after RYGB**

Abhiman Cheeyandira *Philadelphia PA*<sup>1</sup>, Christine Guyre Darby *PA*<sup>1</sup>  
Nazareth Hospital<sup>1</sup>

#### **Introduction**

Jejuno-jejunal (JJ) Intussusception is a rare complication after Roux-en-Y gastric bypass. Recurrent intussusception is even more uncommon. There are no clear clinical guidelines for management.

#### **Clinical Presentation**

A 39-year-old female with a history of Laparoscopic Roux-en-Y gastric bypass 5 years ago presented with recurrent JJ intussusception. She had previously undergone laparoscopic reduction of intussusception. This patient underwent laparoscopic resection of intussuscepted bowel with revision of JJ anastomosis.

#### **Results**

Intra-operatively the Roux and biliopancreatic limbs were both dilated, as was the jejunojejunostomy site. There was intussusception of the common channel into the biliopancreatic limb. The bowel distal to this was decompressed. An attempt was made to reduce the intussusception but was unsuccessful. The intussuscepted bowel including the JJ anastomosis was then resected and a new anastomosis was made. Gross inspection showed intussusception at the anastomosis site. The specimen was then sent for pathology which showed 16cm of small bowel telescoping and focal ischemia. UGI post-op showed no signs of leak or obstruction. The patient's postoperative course was complicated by a short post-op ileus.

#### **Conclusion**

Intussusception after Roux-en-y gastric bypass is rare. Initial laparoscopic reduction appears to be a safe option. For recurrent intussusception, laparoscopic excision of the intussuscepted bowel and revision of the jejunojejunostomy should be done. This can be performed safely and should be the recommended treatment of choice.

## A662

### **REVISION SURGERY BY ESOPHAGOGASTRIC FISTULA, GASTRIC TWIST AND STRICTURES SECONDARY TO GASTRIC SLEEVE**

VIRIDIANA YUNERHI PICHON CABRERA *MEXICO CITY*

GENERAL HOSPITAL DR RUBEN LEÑERO

- Female patient with 50 years, from Mexico City, with history of mellitus diabetes, hipertension and exploratory laparotomy with right ooforectomy and intestinal resection, with superobesity diagnosis, that complete preoperative protocol with normal laboratories and gabinet studies before surgery. She was programed for gastric sleeve, this procedure was done with an incidental perforation of de gastroesophagic union, 10 day after this event presented, fistula, gastric twist and strictures, so we decided revision surgery and conversion to gastric bypass.
- Control endscopies evidence: 2 mm fistula at 1 cm of esophagogastric union and dehiscent of suture line.
- We perform gastric bypass with antiperistaltic loop ascent when performing the gastrojejunumanastomosis in this second surgery time.
- The patient after procedure course hemodynamically stable with vitals within normal parameters, without cardiorespiratory and / or abdominal involvement, tolerating liquid and soft diet, with no drains, with little expense from gastrojejunum fistula with purulent characteristics (14 ml).
- Cultivation of catheter tip (requested 02.05.19 because or fever) is reported without development 04.05.19 and cultivate of wall abscess in abdominal port (pending result)
- Histopathological result of hepatic biopsy (because of the nodular aspect og the liver): reports hepatic cirrhosis.
- The egress where on 08.05.19 and is going to be in medical folloe up.
- We colnclude that continuous revision and conversion surgery is a total challenge for bariatric surgeons and in training, being the procedure of choice dependent on the transoperative findings and general conditions of the patient and complications secondary to bariatric procedures.

## A663

### **Combined Bikini Line Sleeve Gastrectomy & Bikini Line Cholecystectomy**

Tamer Abdelbaki *Alexandria*

Alexandria University

#### **BACKGROUND:**

The Bikini Line Sleeve Gastrectomy (BLSG) is a novel approach where ports are placed in the

umbilicus and below the bikini line. We herein describe Combined Bikini Line Sleeve Gastrectomy & Bikini Line Cholecystectomy (BLLC).

#### **METHODS:**

Patient is a 28 year old female with a BMI of 40. On routine work up ultrasound detected silent gall stones. Patient is placed in the split leg position. A four trocar technique is used. Gastric mobilization is completed using advanced bipolar energy source. Sequential firing of the stapler is done through the umbilicus port. We routinely cover the staple line using nonabsorbable sutures. On the other hand, during cholecystectomy, the fundus is retracted using the left iliac fossa trocar, while the surgeon uses the umbilical port and the right iliac fossa trocar for his right and left working hands; respectively. Gall bladder and stomach are extracted from bikini line port.

#### **RESULTS:**

Operative time was 75 minutes. Patient was discharge on day 1. There were no intra or peri operative complications.

#### **CONCLUSION:**

Combined BLSG & BLLC was found to be potentially feasible. However, we still need further studies to evaluate safety and efficacy.

#### **A664**

#### **RYGB TO SLEEVE GASTRECTOMY FOR HYPOGLYCEMIA**

Amador Garcia Ruiz de Gordejuela *Barcelona*<sup>1</sup>, Ramon Vilallonga Puy *Batcelona*<sup>1</sup>, Renato Roriz da Silva *Barcelona*<sup>1</sup>, Oscar González López<sup>1</sup>, Enric Caubet Busquet *Barcelona*<sup>1</sup>, Ruth Blanco-Colino *Barcelona*<sup>1</sup>, Rocío Martín Sánchez<sup>1</sup>, Miquel Kraft Carre *barcelona*<sup>2</sup>, José Fort López-Barajas<sup>1</sup>

Vall d'Hebron University Hospital<sup>1</sup> Vall d'Hebron Univeristy Hospital<sup>2</sup>

**Introduction.** Hypoglycemia is an uncommon long term complication from RYGB, but with significant quality of life implication. After completing a full study demonstrating hyperinsulinemic hypoglycaemia, and failure of medical treatments, the malabsorptive component of the RYGB should be performed. Then conversion to sleeve gastrectomy in order to maintain some restrictive component is a choice.

**METHODS.** We present a video of a lady with hypoglycemias after RYGB. Patient failed to response to medical treatment to Acarbose and Lyraglutide. Another pathological diagnosis for hypoglycemias were discarded. Patient was proposed to be converted to SG.

**RESULTS.** We performed a 5 port laparoscopic approach. After counting the small bowel limbs, the Roux limb was preserved, so it was resected from the pouch and anastomosed to the biliopancreatic limb. Then the proximal ending of the pouch was resected and the excluded stomach was prepared for the new gastro-gastric anastomosis. As the patient is planned to be converted for SG, fundectomy of the excluded stomach was performed. Patient did well, oral



tolerance was right and hypoglycemias were resolved.

CONCLUSIONS. Conversion to SG is a valid choice for patients with hypoglycemias. It is a challenging procedure but effective in order to deal with this complication.

#### **A665**

### **Laparoscopic Reversal of a Prior Roux-En-Y Gastric Bypass Due to Candy Cane Syndrome**

John Kuckelman *Tacoma WA*<sup>1</sup>, Tori Holtstaul<sup>1</sup>, Jason Bingham *Tacoma WA*<sup>1</sup>, Angel Reyes *Tacoma WA*<sup>1</sup>  
Madigan Army Medical Center<sup>1</sup>

Introduction: Reversal of Roux-en-Y gastric bypass is occasionally required for ongoing complications in select cases. Most commonly, reversals are performed for refractory malnutrition, excessive weight loss, intractable post prandial hypoglycemia, or dumping syndromes. Additional indications include non-healing/recurrent marginal ulcers and efferent blind loop syndromes (“Candy cane syndrome”) in circumstances where simple gastrojejunostomy revision is not appropriate.

Video: We review laparoscopic reversal of a prior Roux-en-Y gastric bypass. The patient is a 47-year-old female active smoker who presented thirteen years after her original operation suffering from continued refractory pain, nausea, vomiting and excessive weight loss with a BMI of 18. Her Surgical history is notable for a prior open total abdominal colectomy for colonic inertia and pelvic floor reconstruction. Preoperative workup included upper endoscopy, an upper GI series as well as an oral contrast enhanced CT which ultimately revealed preferential filling and distension of an inappropriately long (4cm) blind proximal roux limb (“candy cane syndrome”). This finding, concomitant with her excessive weight loss and smoking status, led to the recommendation for reversal. The operation was uncomplicated and normal anatomy was restored (video). Her recovery was uneventful and she was discharged home on post-operative day six. One month follow up has also been uncomplicated and she reports total resolution of her preoperative symptoms. Her excessive weight loss has also improved with a BMI of 20 and pre-albumin of 26.

#### **A666**

### **Laparoscopic Nissen Fundoplication with Roux en Y Gastric bypass is a proper surgery for Morbid Obesity & intractable GERD (Video presentation)**

Ayman Soliman *Dubai*  
Zulekha Hospital Dubai

Persistent Gastro-esophageal reflux symptoms for more than 4ys in spite of different medical treatment with persistent endoscopic signs of reflux esophagitis and gastritis especially in patient

with BMI > 35 kg/m<sup>2</sup> need special concern when seek for surgical management of obesity. Laparoscopic Roux-en-Y gastric bypass has been reported to be the most effective and less debatable option for effective treatment of morbid obesity with persistent GERD (Gastro-esophageal reflux disease). It may be associated with antireflux surgery or not. But based on previous SAGES recommendations; Fundoplication has high failure rate in patients with BMI > 35/m<sup>2</sup>. This video presentation for combined laparoscopic fundoplication and RYGB in treating Morbid Obesity with persistent GERD.

#### **A667**

##### **Case Report: Management of a Complex Gastro-Abdominal Fistula with Intra-hepatic Abscesses**

Milot Thaqi *Columbia MO*<sup>1</sup>, Andrew Wheeler *Columbia MO*<sup>1</sup>, Rama Ganga *Columbia MO*<sup>1</sup>, Jay Jennings *Columbia MO*<sup>1</sup>

University of Missouri - Columbia<sup>1</sup>

**Authors:** Thaqi M, MD. Jennings JB, MD. Ganga RR, MD. Wheeler AA, MD.

**Introduction:** Gastro-Abdominal fistula formation are an uncommon complication as a result of a Roux-en-y Gastric bypass. The reported incidence varies anywhere from 0.6% to as much as 16% for gastrointestinal fistulas, however the pathogenesis, and definitions have not been clearly defined, especially for gastro-abdominal fistulas (GAF). Currently, risk factors associated with GAF are diabetes, smoking, and prior history of peptic ulcer disease.

**Presentation:** A 67 y/o female with a history of a laparoscopic Roux-en-y gastric bypass 3 years prior. Patient had presented with chronic marginal ulceration, and several episodes of hematemesis. Patient acutely presented with septic shock, with CT scan evidence of a gastro-abdominal fistula, along with intra-abdominal and intra-hepatic abscesses.

**Procedure:** Patient underwent a diagnostic laparoscopy, with lysis of adhesions, and drainage of peri-splenic abscess, and intra-operative EGJ and stent placement across the fistula. Patient had drainage of the intra-hepatic abscess by Interventional Radiology. She underwent a series of upper endoscopies, with replacement of Gastro-jejunal stent following the initial procedure. Ultimately, she was taken back for repeat laparoscopy, with partial gastrectomy of remnant stomach, and gastrorrhaphy of gastric pouch.

**Conclusion:** While the patient did require repeat trips to the operating room, we demonstrated that operative drainage of intra-abdominal abscess, along with GJ stenting and IR drainage of the intra-hepatic abscesses to initially treat her sepsis followed by nutritional optimization and eventual laparoscopic revision of her gastric bypass was viable means of managing this complex problem.

#### **A668**

##### **Robotic Heller Myotomy in a Patient with a History of Roux-en-Y Gastric Bypass**

Adel Alhaj Saleh *Lubbock TX*<sup>1</sup>, Amir Aryaie *Lubbock TX*<sup>1</sup>

Texas Tech University Health Sciences Center<sup>1</sup>

A 74 year-old female was referred to surgery clinic with symptoms of worsening dysphagia over the past 2 years

H/E of HTN, DM II, RA, hypothyroidism, OSA

Gastric Bypass done on 2013 for morbid obesity

Current BMI of 40 kg/m<sup>2</sup>

EGD showed increased contractions at distal esophagus and GE junction

Manometry confirmed findings and showed increased LES pressure

UGI severe delay in contrast flow

Nonpropulsive contractions of the esophagus.

We proceeded with Robotic Heller Myotomy

Postoperatively, the patient was discharged on POD #2 tolerating liquid diet.

Post operative UGI showed easy flow of contrast

2 weeks postop was seen in the clinic with complete resolution of symptoms

Conclusion:

Surgical Heller myotomy is preferred over Per Oral Endoscopic Myotomy in patients with previous gastric bypass, due to the small gastric pouch.

With appropriate minimally invasive surgical skills, robotic Heller myotomy can be safely performed in those patients and affords the patients earlier recovery and shorter length of stay.

## **A669**

### **Approach to Reflux after Bariatric Surgery**

Adel Alhaj Saleh *Lubbock TX*<sup>1</sup>, Amir Aryaie *Lubbock TX*<sup>1</sup>

Texas Tech University Health Sciences Center<sup>1</sup>

We Present two cases of reflux after bariatric surgery.

Case #1 is a 74 year-old female with a history of gastric bypass in 2009. she has developed a reflux that is refractory to medical treatment.

Preoperative EGD showed a small Hiatal hernia and patulous LES.

Lower Esophageal Sphincter Augmentation magnetic device was inserted laparoscopically together with hiatal hernia repair

Case #2 is a 42 year-old female with a history of laparoscopic sleeve gastrectomy in 2015 she has developed a reflux that is refractory to medical treatment.

Preoperative EGD Hiatal hernia, her PH study was consistent with pathological reflux.

Lower Esophageal Sphincter Augmentation magnetic device was inserted laparoscopically together with hiatal hernia repair

Both patients did well after surgery and had improvement of their reflux symptoms.

In Conclusion, Lower esophageal augmentation with magnetic device is safe and feasible option to treat reflux refractory to medical management after either sleeve gastrectomy or gastric bypass

**A670**

**A Novel Technique: Removal of an Incidental Gastroesophageal Mass During Sleeve Gastrectomy**

Adam Meyers *Sacramento CA*<sup>1</sup>, Lavina Malhotra <sup>2</sup>, Pandu Yenumula *Sacramento CA*<sup>2</sup>, Gary Grinberg *Elk Grove CA*<sup>2</sup>  
Kasier Permanente<sup>1</sup> Kaiser Permanente<sup>2</sup>

See video

**A671**

**Repair of Large Hiatal Hernia with RNY Gastric Bypass Surgery**

lavina malhotra *Sunnyvale CA*<sup>1</sup>, Adam Meyers *Sacramento CA*<sup>1</sup>, Panduranga Yenumula *Sacramento CA*<sup>1</sup>, Gary Grinberg *sacramento CA*<sup>1</sup>  
Kaiser Permanente Medical Group<sup>1</sup>

NA

**A672**

**The Implications of Bariatric Surgery on Gender Affirmation Therapy, A Case Report**

Philip Borger *New York NY*<sup>1</sup>, Edward Yatco *New York NY*<sup>1</sup>  
Northwell Health<sup>1</sup>

Gender affirming surgery continues to increase in popularity in the transgender patient population. A healthy weight prior to surgery decreases the risk of complications such as wound infection and cardiovascular events, and bariatric surgery can be a valuable therapy in optimizing weight. In addition to gender affirming surgery, hormone therapy is an integral component of the gender transition. Here we present the case of a transgender female on estrogen therapy who underwent laparoscopic sleeve gastrectomy and experienced a precipitous rise in her testosterone level to the normal male range as she began to lose weight. This change was resistant to testosterone-suppressing therapy over several months, after which her testosterone levels began to approach those recommended for transgender females. While the rise in testosterone in this patient was undesirable, it is worth noting the opposite may be true in transgender male patients undergoing bariatric surgery. As more patients undergo gender affirmation therapy in the future, it is important that the impact of bariatric surgery on this process be acknowledged in the medical community to direct expectations and treatment.



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Baker, John (MD)	Consultant relationship with Medtronic
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Blumhagen, Jessica (MD)	No Relevant Financial Relationships Blackwood, Hilary (NP)

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Davis, Daniel (DO FACS)	Proctor relationship with Intuitive Surgical
Dayyeh, Barham Abu (MD)	Speaker/Trainer/Faculty relationship with Endogastric solutions; Speaker/Trainer/Faculty relationship with Medtronic; Researcher/Developer relationship with Apollo Endosurgery
de la Cruz-Munoz, Nestor (MD)	No Relevant Financial Relationships

de la Torre, Roger (MD)	Stock/Shareholder relationship with FreeHold Surgical; Sold Patent relationship with Intuitive Surgical
DeMaria, Eric (MD FASMBS)	Consultant relationship with Medtronic; Honorarium; Speaker relationship with Gore; Honorarium; Training relationship with Intuitive
Desai, Ashish (FRCS, MB)	No Relevant Financial Relationships
Desai, Abhishek (MD)	No Relevant Financial Relationships
Diamond, Jeffrey (BS)	No Relevant Financial Relationships
Diaz, Jesus (BSN RN)	No Relevant Financial Relationships
Dietz, Bill	Researcher/Developer relationship with Novo Nordisk; Advisory, Board or Committee Member relationship with WW (Weight Watchers); Consultant relationship with NAM RT on Obesity Solns; Researcher/Developer relationship with Kresge Foundation; Advisory, Board or Committee Member relationship with PHA
Diggins, Allyson (PhD)	No Relevant Financial Relationships
Dilday, Joshua (DO)	No Relevant Financial Relationships
Dodds, Tammy (MPAS PA-C)	No Relevant Financial Relationships
Doelger, Abigail (MD)	No Relevant Financial Relationships
Dong, Caroline (MD)	No Relevant Financial Relationships
dorado, evelyn (MD, FASMBS)	No Relevant Financial Relationships
Dougherty, Michael (PA-C)	No Relevant Financial Relationships
Doumouras, Aristithes (MD,	No Relevant Financial Relationships

MPH)	
Dovec, Elizabeth (MD FACS, FASMBS)	Consultant relationship with Ethicon; Consultant relationship with Boehringer Labs, LLC; Consultant relationship with Baxter
Dubin, Robert (MD)	No Relevant Financial Relationships
Dudash, Mark (MD)	No Relevant Financial Relationships
Duffy, Andrew (MD)	Consultant relationship with Covidien; Consultant relationship with Bard; Consultant relationship with Intuitive; Advisory, Board or Committee Member relationship with Lexington Medical
Duncan, Titus (MD)	No Relevant Financial Relationships
Dungey, Adam (BSN MBA)	No Relevant Financial Relationships
Duperier, F. Terive (MD)	No Relevant Financial Relationships
Durmus, Ali (MD)	No Relevant Financial Relationships
eckhouse, Shaina (MD)	No Relevant Financial Relationships
Edwards, Michael (MD)	No Relevant Financial Relationships
Edwards, Chris (MD)	Speaker/Trainer/Faculty relationship with Baxter Healthcare
Eid, George (MD)	Consultant relationship with Covidien; Advisory, Board or Committee Member relationship with bariatric fusion
Eid, Joseph (MD)	No Relevant Financial Relationships
Eisenberg, Dan (MD)	No Relevant Financial Relationships
EL BOUYOUSFI, AMINAH (MD)	No Relevant Financial Relationships



El Chaar, Maher (MD)	No Relevant Financial Relationships
Elmaleh, haitham (MRCS, MD)	No Relevant Financial Relationships
Elsherif, Mohamed (PhD, MD)	No Relevant Financial Relationships
ENGLISH, WAYNE (MD FASMBS)	Researcher/Developer relationship with Allurion- Inc; Researcher/Developer relationship with BAROnova; Researcher/Developer relationship with Obalon
Enochs, Paul (MD)	Proctor relationship with Covidien; Researcher/Developer relationship with Covidien; Proctor relationship with Standard Bariatrics; Consultant relationship with BeeWell; Proctor relationship with Intuitive; Advisory, Board or Committee Member relationship with Bariatric Fusion
Enochs, Paul (MD, FACS, FASMBS)	Consultant relationship with Covidien
Espel-Huynh, Hallie (MS)	No Relevant Financial Relationships
Esposito, Christopher (DO)	No Relevant Financial Relationships
Falvo, Alex (MD)	No Relevant Financial Relationships
Farpour-Lambert M.D., Nathalie	No Relevant Financial Relationships
Felix, Edward (MD)	No Relevant Financial Relationships
Feng, Xiaoxi (MD, MPH)	No Relevant Financial Relationships
FINCK, CHRISTINE (Md)	No Relevant Financial Relationships
Fipps, David (DO)	No Relevant Financial Relationships
Fitch, Angela (MD)	Advisory, Board or Committee Member relationship with SetPoint Health

Flanders, Karen (MSN CNP CBN)	No Relevant Financial Relationships
fobi, mathias (MD)	Stock/Shareholder relationship with Bariatec Corporation
Foletto, Mirto (MD)	No Relevant Financial Relationships
Fonseca, Hélder (MD PhD)	No Relevant Financial Relationships
Foroushani, Sophia (MS)	No Relevant Financial Relationships
Fouse, Tammy (MD)	No Relevant Financial Relationships
Fraker, Teresa (MS RN)	No Relevant Financial Relationships
Francis, Andrew (MD)	No Relevant Financial Relationships
Franklin, Nicole (PsyD)	No Relevant Financial Relationships
Freeman, Meredith (BS)	No Relevant Financial Relationships
Friedman, Kelli (PhD)	Consultant relationship with Covidien; Consultant relationship with Teleflex; Consultant relationship with Intuitive; Speaker/Trainer/Faculty relationship with Gore; Speaker/Trainer/Faculty relationship with Teleflex; Speaker/Trainer/Faculty relationship with Merderi; Speaker/Trainer/Faculty relationship with Nova Nordisk
Fuller, William (MD FACS FASMBS)	No Relevant Financial Relationships
Funk, Luke (MD MPH)	No Relevant Financial Relationships
Gagner, Michel (MD)	Speaker/Trainer/Faculty relationship with Ethicon; Speaker/Trainer/Faculty relationship with Covidien; Speaker/Trainer/Faculty relationship with GORE; Consultant relationship with Lexington Medical; Consultant relationship with Bausch Health; Consultant relationship with Novo-

	Nordisk
Gallardo, Regina	No Relevant Financial Relationships
GALVAO NETO, MANOEL (MD)	Consultant relationship with Apollo Endosurgery; Speaker/Trainer/Faculty relationship with Ethicon; Advisory, Board or Committee Member relationship with GI DYNAMICS; Consultant relationship with GI WINDOW; Consultant relationship with Fractyl Labs; Speaker/Trainer/Faculty relationship with Olympus; Speaker/Trainer/Faculty relationship with Medtronic
Galvao Neto, Manoel (MD)	Proctor relationship with Apollo Endosurgery; Advisory, Board or Committee Member relationship with Ethicon; Consultant relationship with GI Windows; Advisory, Board or Committee Member relationship with GI Dynamics; Consultant relationship with Fractyl Labs; Speaker/Trainer/Faculty relationship with Olympus; Speaker/Trainer/Faculty relationship with Medtronic; Speaker/Trainer/Faculty relationship with Medtronic
Gamme, Gary (MD)	No Relevant Financial Relationships
Gan, Tiffany Rui Xuan (MBBS, MRCS)	No Relevant Financial Relationships
Garber, Shawn (MD FACS FASMBS)	Researcher/Developer relationship with Obalon; Stock/Shareholder relationship with Virtual Healthcare Partn; Speaker/Trainer/Faculty relationship with Covidien; Stock/Shareholder relationship with SSJA Bariatric Managemen
Garcia Ruiz de Gordejuela, Amador (MD, PhD)	No Relevant Financial Relationships
Gentles, Charmaine (DNP, ANP-BC RNFA)	No Relevant Financial Relationships
Gershuni, Victoria (MD MSGM)	No Relevant Financial Relationships

Gersin, Keith (MD, FASMBS)	Consultant relationship with GI Dynamics; investor relationship with Standard Bariatrics; Speaker/Trainer/Faculty relationship with WL Gore; Speaker/Trainer/Faculty relationship with Medtronic
Gibbs, Karen (MD FACS, FASMBS)	No Relevant Financial Relationships
Giorgi, Marcoandrea (MD)	No Relevant Financial Relationships
Goetze, Rachel (PhD)	No Relevant Financial Relationships
Goldenberg, Liz (MPH RD CDN)	No Relevant Financial Relationships
Goldman, Rachel (PhD)	No Relevant Financial Relationships
Goldstein, Stephanie (PhD)	No Relevant Financial Relationships
Goodpaster, Kasey (PhD)	No Relevant Financial Relationships
goparaju, Anirudha (MD)	No Relevant Financial Relationships
Gourash, William (PhD CRNP)	Researcher/Developer relationship with Covidien; Researcher/Developer relationship with Ethicon
Grecco, Eduardo (MD)	Consultant relationship with Apollo Endosurgery
Greenwell, Kathriena (MD)	No Relevant Financial Relationships
Griebeler, Marcio	No Relevant Financial Relationships
Grieco, Arielle (MPH)	No Relevant Financial Relationships Griebeler, Marcio
Grilo, Carlos (PhD)	Consultant relationship with Sunovion; Consultant relationship with Weight Watchers; Researcher/Developer relationship with Guilford Press; Researcher/Developer relationship with Taylor and Francis, Pub

Grothe, Karen (PhD)	No Relevant Financial Relationships
Guerron, Daniel (MD)	No Relevant Financial Relationships
Gutierrez Blanco, David (MD)	No Relevant Financial Relationships
Hakky, SHERIF (PHD , FRCS)	No Relevant Financial Relationships
Hale, Lisa (MSN RN CNOR)	No Relevant Financial Relationships
Halpin, Valerie (MD)	Consultant relationship with Medtronic
Hamann, Aaron (PsyD)	No Relevant Financial Relationships
Hamilton, Jessica (Ph.D.)	No Relevant Financial Relationships
Hanna, David (DO)	No Relevant Financial Relationships
Hanna, John (MD)	No Relevant Financial Relationships
Hansen, Rachelle (PhD, LP)	No Relevant Financial Relationships
Harding, Paul (Ph.D.)	No Relevant Financial Relationships
Harkins, Christyn (Student)	No Relevant Financial Relationships
Hart, Laura (MD)	No Relevant Financial Relationships
Hassan, Monique (MD FACS)	No Relevant Financial Relationships
Hassan, Ibrahim (FEBS,Gen Surg,Belgium/MRCS.England )	No Relevant Financial Relationships
Hayes, Kellen (MD)	No Relevant Financial Relationships

Head, William (BA)	No Relevant Financial Relationships
Hecht, Leah (PhD)	No Relevant Financial Relationships
Heinberg, Leslie (PhD)	No Relevant Financial Relationships
Henrique, Juliana (MD)	No Relevant Financial Relationships
Herrera, Miguel (MD PhD)	No Relevant Financial Relationships
Hetrick, Melissa (DO)	No Relevant Financial Relationships Herrera, Miguel (MD PhD)
Hinerman, Amanda (MPH)	No Relevant Financial Relationships
Holden, Jason (MEd RD CNSC)	No Relevant Financial Relationships
Horgan, Santiago (MD)	Speaker/Trainer/Faculty relationship with Ethicon; Stock/Shareholder relationship with Fortimedix; Consultant relationship with Stryker
Horn, Deborah (DO MPH MFOMA)	Consultant relationship with Novo Nordisk; Speaker/Trainer/Faculty relationship with Novo Nordisk; Consultant relationship with Bausch Health; Consultant relationship with Covidien
Horwitz, Daniel (MD)	No Relevant Financial Relationships
Howell, Raelina S. (MD)	No Relevant Financial Relationships
Huh, Yeon-Ju (M.D., Ph.D.)	No Relevant Financial Relationships
Huhnerkoch, Gretchen	No Relevant Financial Relationships
Hui, Benedict (MD)	No Relevant Financial Relationships
Husain, Farah (MD FACS)	No Relevant Financial Relationships

Hutchison, Mary Gray (MPH RD LDN)	No Relevant Financial Relationships
Hutter, Matthew (MD MPH FASMBS)	To attend the Masters in MIS Forum in Boston relationship with Olympus; ator on a PCORI project relationship with PCORI; reimbursed to attend the Masters in MIS relationship with Olympus; reimbursed to attend the Latin American Masters in Boston relationship with Ethicon
Hymowitz, Genna (PhD)	No Relevant Financial Relationships Hutchison, Mary Gray (MPH RD LDN)
IENCA, Roberta (MD, CNS)	No Relevant Financial Relationships
Ihle, Christof (MD)	No Relevant Financial Relationships
inman, margaret (MD ACS, FASMBS)	No Relevant Financial Relationships
Isom MS, Kellene (RD, LDN, CAGS)	No Relevant Financial Relationships
Ivezaj, Valentina (PhD)	No Relevant Financial Relationships
Jackson, Landon (BS)	No Relevant Financial Relationships
Jacobson, Richard (MD)	No Relevant Financial Relationships
Jain-Spangler, Kunoor (MD)	Speaker/Trainer/Faculty relationship with Gore
Jalilvand, Anahita (MD)	No Relevant Financial Relationships
Jamal, Mohammad (MBChB(Hons), Med, FRCSC,FACS, FASMBS)	No Relevant Financial Relationships
Janik, Michal (MD, PhD)	No Relevant Financial Relationships
Jaruvongvanich, Veeravich (MD)	No Relevant Financial Relationships

Järholm, Kajsa (PhD)	No Relevant Financial Relationships
Jawad, Muhammad (MD)	No Relevant Financial Relationships
Jennings, Jay (MD)	No Relevant Financial Relationships
Jiang, Shuwen (MD)	No Relevant Financial Relationships
Johnson, Line Kristin (PhD)	No Relevant Financial Relationships
Johnson-Mann, Crystal (MD)	No Relevant Financial Relationships
Jones, Daniel (MD MS)	Advisory, Board or Committee Member relationship with Allurion- Inc
Jones, R. Ellen (MD)	No Relevant Financial Relationships
Jurgensen, Julia (APRN, CNP, DNP)	No Relevant Financial Relationships
Kajese, Tanyaradzwa (MD)	No Relevant Financial Relationships
Kalil, Jennifer (MD)	No Relevant Financial Relationships
Kamal, Ayman (lecturer)	No Relevant Financial Relationships
Kamody, Rebecca	No Relevant Financial Relationships
Kappus, Mojdeh (MD)	No Relevant Financial Relationships
Karvay, Yvette (M.A.)	No Relevant Financial Relationships
Kassam, Al-Faraaz (MD)	No Relevant Financial Relationships
Kassow, Courtney (PA-C)	No Relevant Financial Relationships



Kaul, Ashutosh (MD, FASMBS)	No Relevant Financial Relationships
Kawahara, Nilton (MD, PhD)	No Relevant Financial Relationships
Kazi, Daanish (DO)	No Relevant Financial Relationships
Kelly, Aaron (PhD)	Consultant relationship with Novo Nordisk; drug/placebo for NIH-funded trial relationship with Astra Zeneca; Consultant relationship with WW; Consultant relationship with Vivus
Kelly, David (MD)	No Relevant Financial Relationships
Kelso, Sarah (MD)	No Relevant Financial Relationships
Kemmeter, Paul (MD)	Speaker/Trainer/Faculty relationship with W.L. Gore & Associates; Research Grant relationship with W.L. Gore & Associates
Kennedy, Colleen (MD)	No Relevant Financial Relationships
Kerrigan, Dennis (PhD)	No Relevant Financial Relationships
Khorgami, Zhamak (MD)	No Relevant Financial Relationships
Kim, Dong Jin (MD)	No Relevant Financial Relationships
Kim, Gina (MD)	No Relevant Financial Relationships
Kindel, Tammy (MD FASMBS)	No Relevant Financial Relationships
King, Wendy (PhD)	No Relevant Financial Relationships
King, Keith (MD)	No Relevant Financial Relationships
Kirwan, John	No Relevant Financial Relationships

Klein, Connie (NP CBN)	No Relevant Financial Relationships
Klick, Barbara (MPH RDN CSOWM LDN)	No Relevant Financial Relationships
Knighton, Brooks (BS)	No Relevant Financial Relationships
Koball, Afton (PhD, ABPP)	No Relevant Financial Relationships
Kolli, Sree (MD)	No Relevant Financial Relationships
Kothari, Shanu (MD FASMBS)	Proctor relationship with Torax Medical, Inc.; Proctor relationship with Ethicon; Speaker/Trainer/Faculty relationship with GORE; Consultant relationship with Lexington Medical; Speaker/Trainer/Faculty relationship with GORE
Kroh, Matthew (MD)	Speaker/Trainer/Faculty relationship with Medtronic; Consultant relationship with Medtronic; Speaker/Trainer/Faculty relationship with Ethicon
Kuckelman, John (DO)	No Relevant Financial Relationships
Kurian, Marina (MD FASMBS)	Speaker/Trainer/Faculty relationship with Gore; Speaker/Trainer/Faculty relationship with Ethicon; Advisory, Board or Committee Member relationship with Allurion- Inc; Speaker/Trainer/Faculty relationship with Medtronic
Kushner, Robert (MD)	No Relevant Financial Relationships
Kushner, Bradley (MD)	No Relevant Financial Relationships
Lakdawala, Muffazal (MS)	Proctor relationship with Covidien; Proctor relationship with Ethicon
LaMasters, Teresa (MD FASMBS)	Honorarium relationship with WL Gore; Speaker/Course Director; Consultant/Speaker relationship with Olympus; Speaker at Symposium

Lamb, Casey (MD)	No Relevant Financial Relationships
Langworthy, Diana (PharmD BCPS)	No Relevant Financial Relationships
Lavender, Jason (PhD)	No Relevant Financial Relationships
Lawless, Mary Ellen (BSN)	No Relevant Financial Relationships
Lawrence, Barbara (RN MED)	No Relevant Financial Relationships
Lee, Arielle (M.D.)	No Relevant Financial Relationships
Lee, Isaac (MD)	No Relevant Financial Relationships
Lee, Han Hong (MD)	No Relevant Financial Relationships
Leeds, Steven (MD)	Consultant relationship with Ethicon; Consultant relationship with Boston Scientific
Li, Mengyi (Dr)	No Relevant Financial Relationships
Liam, Lian (Fellow)	No Relevant Financial Relationships
Liggett, Evan (MD)	No Relevant Financial Relationships
Linden, Bradley (MD)	No Relevant Financial Relationships
Link, Christina (MD)	No Relevant Financial Relationships
Liu, Shinban (DO)	No Relevant Financial Relationships
Liu, Natalie (MD)	No Relevant Financial Relationships
Lo, Tammy (MD)	No Relevant Financial Relationships

Loi, Ken (MD)	No Relevant Financial Relationships
Lopez, Michael (DO)	No Relevant Financial Relationships
Lorentzen, Jolanta (MD)	No Relevant Financial Relationships
Love, Wes (MD)	No Relevant Financial Relationships
Luengas, Rafael (MD)	No Relevant Financial Relationships
Lufti, Rami (MD FACS FASMBS)	Consultant relationship with Olympus; Consultant relationship with Gore
Lutfi, Rami (MD FACS FASMBS)	No Relevant Financial Relationships
Lyo, Victoria (MD)	No Relevant Financial Relationships
Ma, Pearl (MD, FACS, FASMBS)	No Relevant Financial Relationships
MacDonald, Ken (MD)	No Relevant Financial Relationships
MACHADO, Ana Cristina (PhD)	No Relevant Financial Relationships
Mackey, Eleanor (PhD)	No Relevant Financial Relationships
malhotra, lavina (MD)	No Relevant Financial Relationships
Marciniak, Camille (MD)	No Relevant Financial Relationships
Marcotte, Eric (MD FASMBS)	No Relevant Financial Relationships
Marion, Samone (PhD)	No Relevant Financial Relationships
Mark, Anthony (MD)	No Relevant Financial Relationships

Martens, Kellie (Ph.D.)	No Relevant Financial Relationships
Martin, Corby (PhD)	Researcher/Developer relationship with Academy of Nutr. & Diet.; Researcher/Developer relationship with NIH; Researcher/Developer relationship with USDA; Researcher/Developer relationship with PCORI; Researcher/Developer relationship with Louisiana LIFT Fund; Researcher/Developer relationship with Helmsley Trust; Researcher/Developer relationship with NIHR; Researcher/Developer relationship with WW; Speaker/Trainer/Faculty relationship with Academy of Nutr. & Diet.; Advisory, Board or Committee Member relationship with EHE; Advisory, Board or Committee Member relationship with Naturally Slim; Researcher/Developer relationship with Univ. of Mich, MichState
Martin-Fernandez, Katy (MA)	No Relevant Financial Relationships
Mathews, Alexandra (BS)	No Relevant Financial Relationships
Mathur, Winni (BPT, MBA(HA))	No Relevant Financial Relationships
Mattar, Samer (MD FASMBS)	Speaker/Trainer/Faculty relationship with WL Gore; Advisory, Board or Committee Member relationship with Novo Nordisk
Mazzei, Michael (MD)	No Relevant Financial Relationships
McArthur, Karina (MD)	No Relevant Financial Relationships
Mcbride, Corrigan (MD)	No Relevant Financial Relationships
McBride, Cori (MD)	Speaker/Trainer/Faculty relationship with Gore; Speaker/Trainer/Faculty relationship with Found. for Surg Fellowsh
McCann, Charles (MD)	No Relevant Financial Relationships

Medina, Maria (APRN)	No Relevant Financial Relationships
Medlin, Walter (MD)	No Relevant Financial Relationships
Mellion, Katelyn (MD)	No Relevant Financial Relationships
Mellion, Katelyn (MD)	No Relevant Financial Relationships
Menon, Ajay (DO)	No Relevant Financial Relationships
Meyers, Adam (MD)	No Relevant Financial Relationships
Meytes, Vadim (DO)	No Relevant Financial Relationships
Mikami, Dean (MD)	Speaker/Trainer/Faculty relationship with .W.L. Gore
Miller-Matero, Lisa (PhD)	No Relevant Financial Relationships
Mir, Zuhaib (MD)	No Relevant Financial Relationships
Misra, Monali (MD FASMBS)	Speaker/Trainer/Faculty relationship with Medtronic
Mitchell, Charles (MD)	No Relevant Financial Relationships
Mitchell, James (MD)	No Relevant Financial Relationships
Mitchell, Ken (MD FASMBS)	No Relevant Financial Relationships
Modi, Ronak	No Relevant Financial Relationships
Monfared, Sara (MD)	Funding Research Project relationship with ExplORer Surgical
Monte, Scott (PharmD)	No Relevant Financial Relationships

Moon, Rena (MPH, MD)	No Relevant Financial Relationships
Moon, Tiffany (MD FASA)	Researcher/Developer relationship with Merck
Moore, Rachel (MD FACS FASMBS)	Researcher/Developer relationship with Elira; Researcher/Developer relationship with Allurion- Inc; Consultant relationship with Medtronic; Researcher/Developer relationship with Obalon; Consultant relationship with Olympus; Consultant and researcher relationship with Apollo Endosurgery
Moore, Jessie (APRN)	No Relevant Financial Relationships
Moore, Jaime (MD)	No Relevant Financial Relationships Moore, Jessie (APRN)
Moore, Darren (Ph.D. LMFT)	No Relevant Financial Relationships
Moraes, Cristina Machado Bragança de (MD)	No Relevant Financial Relationships
Morton, John (MD)	No Relevant Financial Relationships
Mukherjee, Indraneil (MBBS MD)	No Relevant Financial Relationships
Mulero-Soto, Patricia (Medical student)	No Relevant Financial Relationships
Munie, Semeret (MD)	No Relevant Financial Relationships
Munoz Flores, Fernando (MD)	No Relevant Financial Relationships
Murr, Michel	No Relevant Financial Relationships
Musella, Mario (MD)	No Relevant Financial Relationships
Nadglowski, Joseph (BS)	Employee/Contract Employee relationship with Obesity Action Coalition

Narvaez, Andres (MD)	No Relevant Financial Relationships
Nasser, Hassan (MD)	No Relevant Financial Relationships
Nedelcu, Marius (MD)	No Relevant Financial Relationships
Needham, Victoria (MD)	No Relevant Financial Relationships
Neichoy, Bo (MD)	Proctor relationship with Ethicon
Neovius, Martin (PhD)	Advisory, Board or Committee Member relationship with Ethicon
Nevins, Lori (LCSW)	No Relevant Financial Relationships
NG, Peter (MD)	Consultant relationship with Covidien; Consultant relationship with Ethicon
nguyen, ninh (MD, FASMBS)	Speaker/Trainer/Faculty relationship with Olympus; Speaker/Trainer/Faculty relationship with Covidien
Nguyen, Nicole (PharmD, BCPS)	No Relevant Financial Relationships
Nguyen, Long (DO)	No Relevant Financial Relationships
NOEL, PATRICK (MD)	Speaker/Trainer/Faculty relationship with MID; Speaker/Trainer/Faculty relationship with GORE; Speaker/Trainer/Faculty relationship with Olympus
Norgard, Nicholas	No Relevant Financial Relationships
Noria, Sabrena (MD PhD FRCSC)	No Relevant Financial Relationships
Northup, Joe (MD FASMBS)	Speaker/Trainer/Faculty relationship with Ethicon; Speaker relationship with Medtronic; Fee for site visit relationship with ACS; Site Surveyor
NUDOTOR, RICHARD (MB	No Relevant Financial Relationships



CHB, MPH)	
Okida, Luis Felipe (MD)	No Relevant Financial Relationships
Ortiz Lagardere, Ariel (MD FACS)	Consultant relationship with Obalon; Consultant relationship with Medtronic; Consultant relationship with Reveel
Otto, Bridget (MA)	No Relevant Financial Relationships
Ozmen, Mahir (MD MS FACS FRCS FEBS FASMBS)	No Relevant Financial Relationships
OZMEN, Fusun (MD MSci PhD)	No Relevant Financial Relationships
Paguio, Kristi (LMSW, CSOWM, CDE)	No Relevant Financial Relationships
Panigrahi, Eva (MA)	No Relevant Financial Relationships
PAPASAVAS, PAVLOS (MD)	Consultant relationship with Olympus
Pardo, Ivanesa (MD FACS FASMBS)	Speaker/Trainer/Faculty relationship with Gore
Parikh, Manish (MD)	No Relevant Financial Relationships
Parker, Lisa (MD)	No Relevant Financial Relationships
Paro, Mitch (BA)	No Relevant Financial Relationships
Pechman, David (MD)	No Relevant Financial Relationships
Pedron, Flaviana (MS)	No Relevant Financial Relationships
Pennings, Nicholas	Independent contractor relationship with Medifast; Consultant relationship with OMA

Pereiro, Romina (Licensed)	No Relevant Financial Relationships Pennings, Nicholas Independent contractor relationship with Medifast; Consultant relationship with OMA
Perez, Numa (MD)	No Relevant Financial Relationships
perez quirante, federico (MD)	No Relevant Financial Relationships
Perry, Luke (DO)	No Relevant Financial Relationships
PERSAUD, AMRITA (Ph.D, RDN, CDN, CSOWM)	No Relevant Financial Relationships
Pesta, Carl (MD FASMBS)	Speaker/Trainer/Faculty relationship with Apollo Endosurgery
Peterson, Richard (MD MPH FACS FASMBS)	No Relevant Financial Relationships
Peterson, Ninoska (PhD)	No Relevant Financial Relationships
Peterson, Darren	No Relevant Financial Relationships
Petrick, Anthony (MD FASMBS)	No Relevant Financial Relationships
Pittman, Matthew (MD)	No Relevant Financial Relationships
Podetta, Michele (MD)	No Relevant Financial Relationships
Poggi, Luciano (MD)	No Relevant Financial Relationships
Pokala, Bhavani (Resident)	No Relevant Financial Relationships
Poliakin, Lauren (MD)	No Relevant Financial Relationships
Ponce, Jaime (MD FASMBS)	Consultant relationship with Gore; Speaker/Trainer/Faculty relationship with Gore; Speaker/Trainer/Faculty relationship with Olympus; Consultant relationship with Olympus;

	Consultant relationship with Reshape Medical; FSA PI relationship with Allurion- Inc; Speaker/Trainer relationship with Covidien
Pontillo, Carmela (RN MSN, CBN)	No Relevant Financial Relationships
Pories, Walter (MD)	No Relevant Financial Relationships
Portenier, Dana (MD)	No Relevant Financial Relationships
Portinga, Rob	No Relevant Financial Relationships
Prachand, Vivek (MD)	Speaker/Trainer/Faculty relationship with Covidien; Speaker/Trainer/Faculty relationship with W.L.Gore
Pratt, Janey (MD FACS, FASMBS)	No Relevant Financial Relationships
Price, Bobbie Lou (MSN RN, CBN)	No Relevant Financial Relationships
Primack, Craig (MD)	Speaker/Trainer/Faculty relationship with Novo Nordisk; Speaker/Trainer/Faculty relationship with Orexigen; PR and speaker relationship with Nestle Nutriton; wrote review article relationship with Novo Nordisk; Speaker for cme relationship with Mandatory CME; Speaker for cme relationship with Mandatory CME; Advisory, Board or Committee Member relationship with Phenomix
Provost, David (MD)	No Relevant Financial Relationships
Pryor, Aurora (MD FACS)	Consultant relationship with Covidien; Speaker/Trainer/Faculty relationship with Ethicon; Speaker/Trainer/Faculty relationship with Stryker; Researcher/Developer relationship with Baronova and Obalon; Speaker/Trainer/Faculty relationship with Merck; Speaker/Trainer/Faculty relationship with Gore
Pullatt, Rana (MD)	No Relevant Financial Relationships

Pulliam, Kasiemobi (MD)	No Relevant Financial Relationships
Puzziferri, Nancy (MD MSCS)	No Relevant Financial Relationships
Quadros, Luiz Gustavo (MD)	Consultant relationship with Apollo Endosurgery; Consultant relationship with Medtronic
Quiroz, Omar R. (MD)	No Relevant Financial Relationships
Raftopoulos, Yannis (MD, PhD)	No Relevant Financial Relationships
Ramdath, Asa (MD)	No Relevant Financial Relationships
Ramos, Almino (MD)	No Relevant Financial Relationships
Ramos-Kelly, Jaime Ricardo (Board Certified, The Mexican General Surgery Board)	No Relevant Financial Relationships
Ranev, Dimitar (MD)	No Relevant Financial Relationships
Rao, Ravi (MBBS FRACS)	No Relevant Financial Relationships
Raverdy, Violeta (MD)	No Relevant Financial Relationships
Rigby, Andrea (PsyD)	No Relevant Financial Relationships
Ripley-Hager, Charis (MD)	No Relevant Financial Relationships
Rizwan, Mohammed (MD)	No Relevant Financial Relationships
Robinson, Tyler (MD)	No Relevant Financial Relationships
Rodriguez, John (MD)	No Relevant Financial Relationships
Rodriguez Huerta, Nelson	No Relevant Financial Relationships

Rodriguez Villarreal, Jose (MD)	No Relevant Financial Relationships
Rogers, Ann (MD FASMBS)	No Relevant Financial Relationships
Rogers, Andrew	No Relevant Financial Relationships
Roller, Josh (MD)	Speaker/Trainer/Faculty relationship with Medtronic
Romeijn, Marleen (MD)	No Relevant Financial Relationships
Romero-Funes, David (MD)	No Relevant Financial Relationships
Roriz da Silva, Renato (MD)	No Relevant Financial Relationships
Rosenthal, Raul (MD)	No Relevant Financial Relationships
Roslin, Mitchell (M.D., F.A.C.S.)	Authorship of educational material relationship with Covidien; Speaker/Trainer/Faculty relationship with Ethicon; Advisory, Board or Committee Member relationship with Valentx
Ruiz Cota, Patricia (Student)	No Relevant Financial Relationships
Ryu, Seung-wan (MD)	No Relevant Financial Relationships
Sabbota, Aaron (MD PhD)	No Relevant Financial Relationships
Saber, Alan (MD)	Advisory, Board or Committee Member relationship with Baxter
Sadegh, Marjan	No Relevant Financial Relationships
Salles, Arghavan (MD PhD)	Consultant relationship with Intuitive Surgical; Consultant relationship with Medtronic
Salles, Arghavan (MD, PhD)	No Relevant Financial Relationships Salles, Arghavan (MD PhD) Consultant relationship with Intuitive Surgical;

	Consultant relationship with Medtronic
Samakar, Kamran (MD)	No Relevant Financial Relationships
Sanford, Zachary (MD MSc)	No Relevant Financial Relationships
Sann, Nate (MSN CRNP FNP-BC)	No Relevant Financial Relationships
Santos, Melissa (PhD)	No Relevant Financial Relationships
Sarvepalli, Shravan (MD)	No Relevant Financial Relationships
Saurabh, Shireesh (MD, FACS, FASMBS)	No Relevant Financial Relationships
Sazonov, Edward	No Relevant Financial Relationships
Scharf, Keith (DO FACS)	No Relevant Financial Relationships
Schauer, Philip (MD)	Speaker/Trainer/Faculty relationship with Ethicon; Researcher/Developer relationship with Ethicon; Researcher/Developer relationship with Pacira; Advisory, Board or Committee Member relationship with GI Dynamics; Researcher/Developer relationship with Medtronic; Consultant relationship with Neurotronic; Speaker/Trainer/Faculty relationship with Medtronic; Consultant relationship with WL Gore; Consultant relationship with BD Surgical; Speaker/Trainer/Faculty relationship with Global Academy; Stock/Shareholder relationship with SE HealthCare LLC; Advisory, Board or Committee Member relationship with Keyron
Schirmer, Bruce (MD)	Consultant relationship with Allurion- Inc
Schmittle, Janice (RN BSN, CBN)	No Relevant Financial Relationships
Schniederjan, Matthew (MD,	Proctor relationship with Ethicon

FASMBS)	
Schreyer, Colleen (PhD)	No Relevant Financial Relationships
Schulz, Karen (MSN CNS CBN)	No Relevant Financial Relationships
Schumacher, Leah (MS)	No Relevant Financial Relationships
Scibora, Lesley (DC, PhD)	No Relevant Financial Relationships
Scott, John (MD FACS FASMBS)	Speaker/Trainer/Faculty relationship with Gore
Scovazzo, Nicole (EdD PA-C)	No Relevant Financial Relationships
Seeberg, Lars (MD PhD)	No Relevant Financial Relationships
Seger, Mickey	Consultant relationship with Obalon
Seger, Michael (MD)	Consultant relationship with Obalon; Researcher/Developer relationship with obalon
Senturk, James (MD, PhD)	No Relevant Financial Relationships
Sewell, Mary Susan (MS RD)	No Relevant Financial Relationships
Seymour, Keri (DO)	Speaker/Trainer/Faculty relationship with Covidien; Speaker/Trainer/Faculty relationship with Gore
Shabbir, Asim (Dr)	No Relevant Financial Relationships
Shayani, Vafa (MD FASMBS)	Researcher/Developer relationship with Allurion- Inc; Researcher/Developer relationship with Aspire Bariatrics
Sheipe-Dunham, Marguerite (CRNP, CBN)	No Relevant Financial Relationships
Shikora, Scott (MD, FACS,	No Relevant Financial Relationships

FASMBS)	
Shoar, Saeed (MD)	No Relevant Financial Relationships
Shukla, Alpana (MD)	No Relevant Financial Relationships
Siegal, Steve	No Relevant Financial Relationships
Silecchia, Gianfranco (MD, PhD)	No Relevant Financial Relationships
Silva, Renato Roriz (M.Sc MD)	No Relevant Financial Relationships
Silva Melendez Araújo, Mariana (RD)	No Relevant Financial Relationships
Slapo, Helena (MCs and PhD candidate)	No Relevant Financial Relationships
Sleiman, Youssef (MD)	No Relevant Financial Relationships
Smith, April (PharmD)	No Relevant Financial Relationships
Smith, Kimberly (PhD)	No Relevant Financial Relationships
Smith, Brandon (MD)	No Relevant Financial Relationships
Sockalingam, Sanjeev (MD, MHPE, FRCPC)	No Relevant Financial Relationships
Sogg, Stephanie (PhD)	No Relevant Financial Relationships
Soliman, Basem (MD)	No Relevant Financial Relationships
Soliman, Ayman (MD, FACS)	No Relevant Financial Relationships
Soriano, Ian (MD FACS,	No Relevant Financial Relationships



FASMBS)	
Soriano, Ian (MD)	Consultant relationship with Boehringer Ingelheim; Proctor relationship with Intuitive Surgical
Spaniolas, KONSTANTINOS (MD)	Researcher/Developer relationship with Merck; Advisory, Board or Committee Member relationship with Biom Up; Speaker/Trainer/Faculty relationship with Gore
Srivastava, Gitanjali (MD, FACP, FAAP)	Advisory, Board or Committee Member relationship with Novonordisk; Advisory, Board or Committee Member relationship with Rhythm
Stadsvold, Brianna (MD)	No Relevant Financial Relationships Srivastava, Gitanjali (MD, FACP, FAAP) Advisory, Board or Committee Member relationship with Novonordisk; Advisory, Board or Committee Member relationship with Rhythm
Steffen, Kristine (PharmD PhD)	Researcher/Developer relationship with Shire; Researcher/Developer relationship with Sanford Profile
Steinberg, Scott (MD FACS)	No Relevant Financial Relationships
Stewart, Karen (PhD)	No Relevant Financial Relationships
Still, Christopher (DO DFACN FACP)	No Relevant Financial Relationships
Strange, Sally (PhD, RN, CBN)	No Relevant Financial Relationships
Stroud, Andrea (MD, MS)	No Relevant Financial Relationships
Sudan, Ranjan (MD)	No Relevant Financial Relationships
Suggs, Jay (MD)	No Relevant Financial Relationships
Summer, Suzanne (MS, RD)	No Relevant Financial Relationships
Svanevik, Marius (MD)	No Relevant Financial Relationships

Tabone, Lawrence (MD, FASMBS, FACS)	No Relevant Financial Relationships
Tamburrini, Danielle (DO)	No Relevant Financial Relationships
Tan, Sarah Ying Tse (MBBS, MRCP, MMed)	No Relevant Financial Relationships
Tan, Ying Zhi (Miss)	Employee/Contract Employee relationship with NUH Singapore
Tann, John (MD)	No Relevant Financial Relationships
Tariq, Nabil (MD, FASMBS)	No Relevant Financial Relationships
Tavakkoli, Ali (MD)	Cofounder relationship with AltrixBio
Teixeira, Julio (MD)	No Relevant Financial Relationships
Teixeira, Andre (MD FACS)	No Relevant Financial Relationships
Telem, Dana (MD)	Consultant relationship with Medtronic; Consultant relationship with Gore; Consultant relationship with Ethicon
Tewksbury, Colleen (PhD MPH RD LDN)	No Relevant Financial Relationships
Tewksbury, Colleen (PhD, RD)	No Relevant Financial Relationships
Thaqi, Milot (MD)	No Relevant Financial Relationships
Thomas, Graham (PhD)	Advisory, Board or Committee Member relationship with Slimming World
Thomas, Diana	No Relevant Financial Relationships
Thomas, John (PhD)	No Relevant Financial Relationships

Thomas, Jaime (MHA)	No Relevant Financial Relationships
Thompson, Christopher (MD, MSc, FACG, FASGE, AGAF)	Consultant relationship with Boston Scientific; Consultant relationship with Covidien; Consultant relationship with USGI Medical; Principal Investigator relationship with USGI Medical; Consultant relationship with Olympus; Researcher/Developer relationship with Olympus; Consultant relationship with Apollo Endosurgery; Principal Investigator relationship with Apollo Endosurgery; Consultant relationship with GI Windows; Principal Investigator relationship with Aspire Bariatrics; Principal Investigator relationship with Spatz; Consultant relationship with GI Dynamics
Thompson, Jonathan (MD FASMBS)	Stock/Shareholder relationship with Standard Bariatrics
Thour, Amit (MBBS)	No Relevant Financial Relationships
Tishler, Darren (MD, FASMBS)	Consultant relationship with Covidien
Tishler, Darren (MD)	Consultant relationship with Covidien
Torensma, Bart (MSC, PHD.C)	No Relevant Financial Relationships
Torres, Antonio Jose (MD)	No Relevant Financial Relationships
Torres, Antonio (MD PhD FACS)	No Relevant Financial Relationships
Toulany, Alene (MD, FRCPC)	No Relevant Financial Relationships
Tran, Thuy (MD)	No Relevant Financial Relationships
Tsai, Catherine (MD)	No Relevant Financial Relationships
Tuppo, Catherine	No Relevant Financial Relationships

(Coordinator, Physical Therapist)	
Twells, Laurie (PhD)	No Relevant Financial Relationships
Uittenbogaart, Martine (MD)	No Relevant Financial Relationships
Vacharathit, Voranaddha (MD)	No Relevant Financial Relationships
Vangoitsenhoven, Roman (MD, PhD)	No Relevant Financial Relationships
Varban, Oliver (MD FACS, FASMBS)	Employee/Contract Employee relationship with Blue Cross Blue Shield
Veilleux, Eric (MD)	No Relevant Financial Relationships
Vela, Alyssa (PhD)	No Relevant Financial Relationships
Ver, Marel (MD)	No Relevant Financial Relationships
Verboonen Sotelo, Sergio (MD)	No Relevant Financial Relationships
Verdugo, Juan Carlos (MD)	No Relevant Financial Relationships
Verhaak, Allison (PhD)	No Relevant Financial Relationships
Viegas, Fabio (MD)	No Relevant Financial Relationships
Vieira, Flávio (MSc)	No Relevant Financial Relationships Viegas, Fabio (MD)
Vilas Boas, Marcos	Proctor relationship with Panther healthcare; Speaker/Trainer/Faculty relationship with Covidien
Wadhwa, Anu (MD)	No Relevant Financial Relationships
WANG, Bing (MD)	No Relevant Financial Relationships

Webb, Lars (MD)	No Relevant Financial Relationships
Webber, Deja (B.Sc.)	No Relevant Financial Relationships
Weiner, Matthew (MD)	No Relevant Financial Relationships
Welch, Brian (DO)	No Relevant Financial Relationships
West-Smith, Lisa (PhD LISW-S)	No Relevant Financial Relationships
Wheeler, Andrew (MD FACS)	Research Support relationship with Covidien; Speaker/Trainer/Faculty relationship with Covidien
Williams, Brandon (MD FACS)	No Relevant Financial Relationships
Williams-Kerver, Gail (PhD)	No Relevant Financial Relationships
Wilson, Erik (MD)	Speaker/Trainer/Faculty relationship with Apollo Endosurgery; Speaker/Trainer/Faculty relationship with Olympus; Researcher/Developer relationship with Allurion-Inc; Speaker/Trainer/Faculty relationship with Intuitive; Speaker/Trainer/Faculty relationship with Gore
Wittgrove, Alan (MD, FASMBS)	Speaker/Trainer/Faculty relationship with Ethicon
Wnuk, Susan (PhD)	No Relevant Financial Relationships
Wolfe, Bruce (MD FACS)	No Relevant Financial Relationships
Wolff, Jana	No Relevant Financial Relationships
Wong, Kristen (MD)	No Relevant Financial Relationships
Wulkan, Mark (MD, FAAP, FACS)	No Relevant Financial Relationships

Yada, Keigo	No Relevant Financial Relationships
yang, fei (Dr)	No Relevant Financial Relationships
Yang, Jingge (Ph.D)	No Relevant Financial Relationships
Yetasook, Amy (MD)	No Relevant Financial Relationships
Yeung, Kai Tai Derek (BMBS MRCS BMedSci)	No Relevant Financial Relationships
Youngwirth, Linda	No Relevant Financial Relationships
Zarabi, Sharon (RD CDN CPT)	education relationship with Covidien
Zeller, Meg (PhD)	No Relevant Financial Relationships
Zenilman, Ariela (MD)	No Relevant Financial Relationships
Zerrweck, Carlos (MD FACS)	No Relevant Financial Relationships
Zevin, Boris (MD, PhD)	Research funding relationship with Covidien; Speaker/Trainer/Faculty relationship with Ethicon
Zhang, Peng (MD PhD)	No Relevant Financial Relationships
Zhu, Xiaocheng ((Ph.D., M.D.)	No Relevant Financial Relationships
Zobel, Michael (MD)	No Relevant Financial Relationships
Zundel, Natan (MD FASMBS)	No Relevant Financial Relationships
Apovian, Caroline (MD)	Advisory, Board or Committee Member relationship with Nutrisystem; Advisory, Board or Committee Member relationship with Scientific Intake; Consultant relationship with Ferring; Advisory, Board or Committee Member

	<p>relationship with Zafgen; Advisory, Board or Committee Member relationship with Novo Nordisk; Advisory, Board or Committee Member relationship with Takeda; Advisory, Board or Committee Member relationship with Gelesis; Advisory, Board or Committee Member relationship with Science Smart LLC; Advisory, Board or Committee Member relationship with Sanofi-Aventis; Advisory, Board or Committee Member relationship with GI Dynamics; Advisory, Board or Committee Member relationship with Orexigen; Advisory, Board or Committee Member relationship with Baystate Milling; Advisory, Board or Committee Member relationship with Dunkin Donuts; Advisory, Board or Committee Member relationship with Au Bon Pain; Researcher/Developer relationship with Takeda; Researcher/Developer relationship with Gelesis; Researcher/Developer relationship with GI Dynamics; Researcher/Developer relationship with Aspire Bariatrics; Researcher/Developer relationship with Orexigen; Researcher/Developer relationship with MYOS Corporation; Researcher/Developer relationship with Energesis; Advisory, Board or Committee Member relationship with Xeno Biosciences; Advisory, Board or Committee Member relationship with Rhythm Pharmaceuticals; Advisory, Board or Committee Member relationship with SetPoint Health</p>
<p>Aronne, Louis</p>	<p>Researcher/Developer relationship with Allurion- Inc; Advisory Board, Board of Directors, and have equity interest relationship with Jamieson Laboratories; Consultant, Advisory Board, Researcher relationship with Janssen Pharmaceuticals; Consultant, Advisory Board, Researcher relationship with Novo Nordisk; Consultant, Advisory Board relationship with Pfizer; Consultant, Advisory Board, Researcher relationship with Eisai; Consultant, Advisory Board relationship with Real Appeal; Researcher/Developer relationship with AstraZeneca; Advisory, Board or Committee Member relationship with MYOS Corporation; Advisory, Board or Committee Member relationship with BMIQ; Researcher/Developer relationship with Aspire Bariatrics; Stock/Shareholder relationship with Zafgen; Consultant, Advisory Board, Research Grant, Equity Interest</p>

	relationship with Gelesis; Stock/Shareholder relationship with ERX Pharmaceuticals
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