

## STUDENTS/RESIDENTS/FELLOWS SESSION ABSTRACTS

### SRF-101

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#### ECG ABNORMALITIES INCREASE WITH BMI

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**Background:** In recognition of the likelihood that the obese may have cardiac disease, bariatric surgeons routinely obtain electrocardiograms (ECGs) particularly in the super-obese. Little is known about the findings of this routine pre-operative practice.

**Methods:** 573 pre-operative electrocardiograms (ECGs) of patients undergoing laparoscopic gastric bypass at an academic medical center were reviewed. T-tests and chi-squared tests were used to determine significance, comparing obese patients with BMIs < or >50 ECG findings.

**Results:** The super-obese (n = 175) and obese (n = 398) had average BMIs of 56.1 kg/m<sup>2</sup> and 42.8 kg/m<sup>2</sup>. Super obesity is associated with increased heart rate (78.4 vs. 74.8 bpm; p = 0.002), longer PR interval (163.7 vs. 159.5 ms; p = 0.047), prolonged QRS duration (95.0 vs. 89.1 ms; p < 0.001), longer QTc interval (425.9 vs. 420.0 ms; p = 0.024), increased rates of poor R wave progression (4.6 vs. 1.5%; p = 0.029), increased rates of atrial fibrillation (2.9 vs. 0.0%; p = 0.001), increased rates of intraventricular conduction defect (6.6 vs. 3.0%; p = 0.034), increased rates of anteroseptal infarction (2.3 vs. 0.3%; p = 0.016), decreased RV5 amplitudes (0.8 vs. 1.1 mV; p = 0.027), and increased ECG signs of ischemia (0.0 vs. 3.8%; p = 0.009).

**Conclusion:** This study underscores the progressive impact of excess body weight upon cardiac function and the effects of weight loss on ECG abnormalities will be further explored.

### SRF-102

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#### THORACIC TRUNCAL VAGOTOMY FOR THE TREATMENT OF REFRACTORY MARGINAL ULCERS AFTER ROUX-EN-Y GASTRIC BYPASS SURGERY

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**Background:** Marginal ulcers after Roux-en-Y gastric bypass (RYGB) occur in 1-16% of patients. Medical treatment is successful in 95% of patients. Refractory ulcers are often treated with gastrojejunal anastomotic revision with or without vagotomy. This study describes our results with thoracic truncal vagotomy (TTV) as an unreported approach to the treatment of refractory marginal ulcers after RYGB.

**Methods:** A retrospective review of a prospectively maintained database of all bariatric patients at a tertiary referral center from 2001 to 2011. TTV was performed via unilateral video-assisted thoracoscopy with ligation of bilateral vagi nerves.

**Results:** Eight female patients underwent TTV. Mean age and body mass index (BMI) at TTV was 44 years and 25.65 kg/m<sup>2</sup>, respectively. The mean operating time was 84 minutes with a mean length-of-stay of 1.88 days (1-4 days). Mean BMI at the time of RYGB was 46.46 kg/m<sup>2</sup> and the mean time between initial RYGB and TTV was 54 months. Four patients underwent revisional RYGB prior to TTV and seven patients had multiple abdominal operations related to RYGB. One patient had recurrent ulcer disease 2 years after TTV, likely related to continued smoking. Mean follow-up after TTV was 11 months (19 days to 3.9 years).

**Conclusion:** In patients with refractory marginal ulcers after RYGB, a TTV allows ligation of the vagi nerves in an unviolated tissue plane with good results. Ultimately, this approach may be considered prior to revisional surgery via an abdominal approach.

### SRF-103

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#### IMPACT OF COMPLETE MESENTERIC CLOSURE ON SMALL BOWEL OBSTRUCTION AND INTERNAL HERNIA AFTER ANTECOLIC RY GASTRIC BYPASS

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**Background:** Although it is generally accepted that closure of mesenteric defects after laparoscopic RY gastric bypass (LRYGB) reduces the incidence of SBO, data supporting this belief are inconsistent.

After a rash of acute SBO in our LRYGB patients we changed our technique of mesenteric closure.

**Methods:** The records of 872 consecutive patients who had antecolic LRYGB by one surgeon over a 9 year interval were reviewed for acute SBO. The first 654 patients, mean follow up = 100 + 12 months, had incomplete mesenteric closure vs. complete closure in 218 remaining patients, mean follow up = 40 + 14 months. Minimum follow up was 1 year.

**Results:** Total incidence of acute SBO was 4.0% (35/872) including 4.4% (29/654) in the incomplete closure group vs. 2.8% (6/218) in the complete closure patients. Seventeen (2.6%) of the incomplete closure patients with acute SBO had internal hernias vs. one (0.5%) in the complete closure group.

Twenty-six patients with incomplete closure developed symptoms of SBO and subsequently had elective repair of mesenteric hernias vs. none in complete closure group ( $p < 0.02$ ). Postop morbidity and mortality rates after surgery for SBO were 30% and 7.4% in incomplete group vs. zero in patients with complete closure.

**Conclusion:** Complete closure of mesenteric defects in antecolic LRYGB results in lower incidence of subsequent acute SBO, and significant reduction in internal mesenteric hernias. Complications were also reduced after operations for acute SBO in patients who had complete mesenteric closure.

#### SRF-104

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### METABOLIC SURGERY FOR NON-OBESE (BMI < 27 KG/M2) ASIAN PATIENTS WITH TYPE 2 DIABETES MELLITUS: EARLY RESULTS

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**Background:** The surgical treatment in the form of laparoscopic Roux-en-Y gastric bypass for type 2 diabetes mellitus in morbidly obese patients has been well documented. We hereby tried to study the efficacy and safety of LRYGB on improvement of type 2 diabetes mellitus in non-obese Asian population (BMI<27kg/m2).

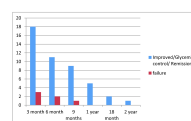
**Methods:** 21 (7M/14 F) non-obese (BMI< 27 kg/m2) patients between June 2009 and May 2011 with Type

2 DM underwent LRYGB and followed up for 3-24 months period. Data on patient demographics, BMI, details of DM including duration of disease, family history, medication use and outcome after surgery (remission, glycemic control, improvement or failure, complications), co-morbidities were prospectively collected and analyzed.

**Results:** The mean age was 53 years (range 35-65) with mean BMI 24.09 kg/m2 (range 20.9-26.8). Mean duration of DM was 10.1 years (range 1-20) and 14 (66.6%) patients had positive family history of DM. Mean operative time was 106 minutes (range 46-280). There was no mortality. Two (9.5%) patients had postoperative complications, One patient developed intestinal obstruction due to internal herniation, successfully treated Laparoscopically and the other had dehydration and poor intake managed successfully with nutritional support. 11 (85%) out of 13 patients that followed for 6 months and all 5 patients (100%) that followed for 1 year had improvement in DM status.

**Conclusion:** Our study showed that metabolic surgery in terms of LRYGB is safe and may have a role in treatment of non-obese Type 2 DM patients.

Figure 10: Clinical results in terms of improvement and failure



#### SRF-105

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### IMPACT OF FOLLOW-UP ON CLINICAL OUTCOMES AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS

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**Background:** This study investigated the impact of follow-up compliance on clinical outcomes after laparoscopic Roux-en-Y gastric bypass (LRYGB).

**Methods:** Retrospective chart review was conducted on patients undergoing LRYGB during 2004-2008. Data collected included demographics, % excess weight loss (%EWL), and presence of comorbidities including type 2 diabetes mellitus (T2DM), hypertension (HTN), obstructive sleep apnea (OSA), and hyperlipidemia (HLD). Data were stratified by follow-up, with compliance (C) defined as attendance at  $\geq 50\%$  of follow-up appointments vs. noncompliance (NC) as  $< 50\%$ . %EWL was analyzed using Generalized Estimating Equations. Presence of comorbidities was determined at the last appointment within two years. Analysis was performed using R (version 2.13.0) and SAS (version 9.2) analytical software.

**Results:** 529 patients met inclusion criteria (C=373, NC=156). Patients in the C vs. NC group were older (median age 43 vs. 39 years, respectively;  $p=0.0006$ ), and had more females (80.2% vs. 71.2%, respectively;  $p=0.0237$ ). Median follow-up compliance of the C group was 77.8% vs. NC at 33.3%. In an adjusted model, %EWL was 2.66% higher in the C group ( $p=0.019$ ). There was no statistically significant difference in the improvement or resolution of T2DM, HTN, OSA, or HLD between the C and NC groups.

**Conclusion:** Although there was a statistically greater %EWL of 2.66% in the C vs. NC group, this is unlikely to be clinically significant. Further, there was no statistically significant difference in the improvement or resolution of the selected comorbidities. Future studies will need to identify the optimal follow-up protocol and the reasons patients fail to comply.

#### SRF-106

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#### HIATAL TESTING AND CONCURRENT HIATAL REPAIR AT LAPAROSCOPIC GASTRIC BANDING (LAGB)

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**Background:** The association between morbid obesity and reflux symptoms is well-established. The effect of gastric banding on reflux symptoms is unclear. Concurrent crural repair can also improve reflux symptoms and reduce medication usage. However, these data must be interpreted with caution because most studies lack a control group of patients

(i.e. those with reflux symptoms without the presence of a hiatus hernia requiring repair). It is possible that weight-loss alone (and not the hiatal repair) is responsible for the reported improvement in reflux symptoms. In our practice a simple test for a hiatal hernia is performed routinely during gastric band placement. If a hiatus hernia is found then a crural repair is undertaken. This study compares the outcomes of gastric band patients with symptomatic reflux who undergo crural repair with those who do not.

**Methods:** Prospective database analysis. Hiatal test was positive if a 20ml gastric balloon could be trawled from stomach into the oesophagus.

**Results:** 450 patients underwent LAGB. 15% (n=26) had pre-op reflux symptoms with positive hiatal test. 153 patients had reflux symptoms with a negative hiatal test. Following hiatal repair 96% had resolution of symptoms at one year compared to 22% (n=34) of patients who did not have a crural repair,  $p<0.01$ . Modified Visick scores were lower after hiatal repair (1 v 2,  $p<0.01$ ). There was no difference in weight loss between these groups at one year (43% v 38%,  $p=0.23$ ).

**Conclusion:** Successful management of reflux symptoms with gastric banding is dependent on repair of any hiatal laxity and not weight loss.

#### SRF-107

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#### HIATAL HERNIA AND GERD SYMPTOMS IN OBESE PATIENTS SUBMITTED TO SLEEVE GASTRECTOMY

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**Background:** Obesity is an independent risk factor for GERD, which is often associated to the presence of hiatal hernia (HH). Data about effect of LSG on GERD symptoms are still controversial. Aim: to compare the prevalence of GERD symptoms before and after at least six months from surgery in patients with or without evidence of HH.

**Methods:** From January 2007 to March 2011, 251 patients (M/F: 60/191; age:  $36.8 \pm 12$  y; mean weight:  $120.3 \pm 16.9$  Kg; BMI:  $45.1 \pm 6.2$  Kg/m<sup>2</sup>) were selected for LSG. All patients underwent an upper-gastrointestinal endoscopy and a barium swallow double contrast X-ray technique. Participants were

interviewed about their GERD symptoms using a standardized questionnaire before surgery and six months post operatively. A score out of a maximum of 6 was obtained for each symptom. Intraoperative findings constituted the reference standard for the definition of the existence of HH and whenever the HH was found, it was always repaired.

**Results:** A hiatal hernia was intraoperatively found in 83 patients and a LSG with hiatus hernia repair was performed (HH-LSG group); the others (168) underwent LSG without hiatus hernia repair (LSG-group). About 38% of HH-LSG group's patients vs. 48% of LSG-group's patients reported GERD symptoms preoperatively ( $p>0,05$ ) and the mean scores of heartburn, regurgitation were not different between the two groups ( $p>0,05$ ). At follow up (17±10 months), the percentages of patients of HH-LSG group and LSG group reporting GERD symptoms were similar (35% vs. 24%,  $p>0,05$ ) but the mean scores of regurgitation ( $4\pm3,46$  vs.  $0,56\pm1,33$ ) and heartburn ( $4\pm3,46$  vs.  $0,11\pm0,33$ ) were significantly higher in HH-LSG group compared to LSG-group ( $p=0,025$  and  $p=0,004$  respectively).

**Conclusion:** Patients with HH tend to report more severe GERD symptoms after LSG even if a hiatus hernia repair has been performed intraoperatively.

## SRF-108

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### ASSOCIATION OF METABOLIC SYNDROME WITH LIVER HISTOPATHOLOGY IN 529 PATIENTS UNDERGOING BARIATRIC SURGERY

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**Background:** The current paradigm holds that advanced (>33%) hepatic steatosis (HS), associated with morbid obesity, predisposes patients to hepatic fibrosis (HF). We sought to characterize the relationship between metabolic syndrome (MS) and liver histopathology (HS, HF) and identify metabolic risk factors for HF.

**Methods:** Demographic, anthropomorphic, and comorbidity data were prospectively collected on 529 bariatric surgery patients. Biochemical data and intra-operative liver biopsies were also obtained.

**Results:** The majority of patients ( $n=380$ , 71.8%) had MS. These patients were older ( $47.3\pm10.6$  years vs.  $40.1\pm11.0$  years,  $p<0.0001$ ), were more often male (20.3% vs. 8.1%,  $p<0.0005$ ), and had higher BMI ( $47.5\pm8.5$  kg/m<sup>2</sup> vs.  $44.3\pm6.7$  kg/m<sup>2</sup>,  $p<0.0001$ ) than patients without MS ( $n=149$ , 28.2%). Most patients

(86.4%) exhibited some degree of HS. MS patients were more likely to have advanced HS (35.7% vs. 20.1%,  $p<0.001$ ). Overall, advanced HS more commonly resulted in HF (27.1% vs. 12.4%,  $p<0.005$ ); however, the presence of MS, with or without advanced HS, did not predispose to HF. Two risk factors (triglycerides  $\geq 200$  mg/dL and hemoglobin A1c  $\geq 7\%$ ) in MS patients significantly predicted HF (40.0% vs. 19.2%,  $p<0.05$ ) and were associated with ALT elevation (95%).

**Conclusion:** HS is a common finding in bariatric surgery patients that becomes more advanced in patients with MS but does not sufficiently predict the presence of HF. The additional risk for the development of HF in patients with MS seems to be related to poor control of dyslipidemia and diabetes. Bariatric surgery to decrease HS and adequately treat metabolic comorbidities should be considered first-line treatment in these patients.

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