

**P-01.**

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**A COMPARISON OF UNFRACTIONATED HEPARIN AND ENOXAPARIN PROPHYLAXIS REGIMENS IN BARIATRIC SURGICAL PATIENTS OVER AN 18 MONTH PERIOD**

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**Background:** Morbid obesity and its comorbid conditions place bariatric surgical patients at a higher risk for developing deep venous thrombosis. The optimal anticoagulation regimen of thromboembolic events in the bariatric population is unknown. This study is a retrospective nonrandomized comparison of Enoxaparin and Heparin use in 172 consecutive bariatric surgical patients over 18 months.

**Methods:** Retrospective reviews of 172 patient cases were followed. The time period was January 1, 2007 through June 30, 2008. All patients were followed for 30 days for occurrences via the NSQIP database. Surgical breakdown: 14 open gastric bypasses, 144 laparoscopic gastric bypasses and 14 sleeve gastrectomies. 50 of the patients received Enoxaparin 40mg subcutaneous BID, while the other 122 received Heparin 5000 units subcutaneous TID. All patients began pharmacological prophylaxis regimens preoperatively.

**Results:** There were 0% DVTs/ VTEs in either group, 0% bleeding events. One patient which received Heparin experienced a Hgb decrease of greater than 3gms where the prophylaxis was held, caused by a remnant stomach leak. The cost difference is approximately \$35.00 per patient more for the Lovenox group; this is without consideration of nursing patient care hours cost for an additional unfractionated heparin dose per patient per day.

**Conclusion:** In our consecutive review of 172 patients over an 18 month period, both enoxaparin and heparin were effective at preventing thromboembolic events following laparoscopic and open gastric bypass. Bleeding complications were not present in either group. Only one patient had a drop of Hemoglobin greater than 3 points related to a remnant stomach leak. The costs of either chemical prophylaxis regimens were nearly equal without considering the costs of nursing administering an additional dose of unfractionated heparin per day per patient.

**P-02.**

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**INTERMEDIATE OUTCOMES FOLLOWING BARIATRIC SURGERY ON HIGH RISK PATIENTS**

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**Background:** Patients with life threatening comorbidities are frequently not deemed to be candidates for bariatric surgery. However, these patients may benefit the most from even modest improvements in BMI if bariatric surgery can be performed safely. Our goal is to evaluate the

outcomes and safety of bariatric surgery performed on patients with ASA Score of 4.

**Methods:** We retrospectively reviewed patients undergoing bariatric surgery at our institution from 1997 to 2007 who were given ASA Scores of 4.

**Results:** We identified 38 patients (24 female, 14 male) with at least 1 year follow-up, mean BMI of 58 (range 36-105) who were preoperatively scored as ASA 4. 4 patients underwent adjustable gastric banding (AGB), 7 laparoscopic gastric bypass (LGP), 3 laparoscopic sleeve gastrectomy (LSG), 23 open gastric bypass (OGP). Patients that had AGB had 17.8%EBWL, LGP had 29.7%EBWL, LSG had 38.3%EBWL, and OGP had 52.2%EBWL. There were 3 deaths in the first 30 days and 1 additional death within the first year. All of the deaths were in the OGP group. The mean BMI was 81 for the 3 deaths. The 30d mortality was 7.9%, and the 1yr mortality was 10.5%, which correlates with the predicted mortality of an ASA 4 patient.

**Conclusion:** While undergoing bariatric surgery is a high risk option for morbidly obese patients with severe comorbidities, frequently there are few alternatives. The initial %EBWL is lower than most bariatric patients. Most likely, this is because their comorbidities prevent them from making other behavioral changes that facilitate weight loss (increasing exercise).

### P-03.

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#### **RESOLUTION OF DIABETES MELLITUS IN AN ELDERLY PATIENT POPULATION UNDERGOING ROUX-EN-Y GASTRIC BYPASS VS. LAPAROSCOPIC GASTRIC BAND**

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**Background:** Indications for bariatric surgery are expanding and include morbidly obese patients over 60. The two most common bariatric operations performed are Roux-en-Y gastric bypass (RYGB) and laparoscopic gastric band (LAGB). The purpose of this study is to compare the rate of resolution of diabetes mellitus between LAGB and RYGB in an elderly (age > 60) population at one year.

**Methods:** All data was retrospectively collected and entered into an electronic database. Preoperative data points included age, body mass index, gender, number of comorbid conditions, and the presence of diabetes, oral hypoglycemic agents, insulin usage, and hemoglobin A1c values (HbA1c). Data points and laboratory values were compared between RYGB and LAGB at operation and at one year.

**Results:** A total of 36 bariatric patients at least 60 years old at time of surgery with one year follow-up at a single center were analyzed (19 LAGB, 17 RYGB). The two groups were comparable based on age, initial BMI, and preoperative A1C. There was one sudden death at 1 month in the RYGB group with no known cause. Using MANOVA fit model to compare changes in BMI, number of oral hypoglycemics, presence of DM, and insulin requirement, there were significant ( $p < .05$ ) differences in BMI, number of hypoglycemics, presence of DM, and HbA1c. However, the insulin requirement between the two groups was not statistically

significant.

**Conclusion:** RYGB is more effective than LAGB in achieving diabetes remission and improvement at one year in patients over 60 years of age. Further assessment is necessary to determine if RYGB's superior remission of DM is sustainable.

	Average BMI	Average Number of Oral Hypoglycemics	Type 2 Diabetes	Patients with continued Insulin Requirement	HbA1c
RYGB PreOp	47.5	2.3	100%	100%	7.9%
RYGB 1 Yr	33.9	0.35	24%	17%	6.2%
LAGB PreOp	49.7	2.2	100%	47%	7.2%
LAGB 1 Yr	42.2	1.5	68%	32%	7.0%

#### P-04.

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### GASTRIC BALLOON EFFICIENCY ON WEIGHT LOSS (WL) WITH A MULTIDISCIPLINARY MEDICAL FOLLOWS UP

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**Background:** This study shows efficiency of air-filled HELIOSPHERE® and water-filled BIB® gastric balloons on Weight Loss and Excess Weight Loss and their tolerances after removal and at 6 months after extraction.

**Methods:** 117 patients are included in a prospective, comparative and non randomized study. The both types of gastric balloons are implanted for a 6 months period then removed. All along the portage and after extraction, medical follows up of gastroenterologist, nutritionist and psychiatrist are done to modify patient alimentary habits and behavior

**Results:** 85 extractions are actually done. EWL is  $51.9 \pm 1.0$  % and WL is  $10.2 \pm 1.6$  kg. After 1 year of multidisciplinary medical follow up (included portage period), 19 patient results show an EWL of  $53.2 \pm 19.5$ % and a WL of  $13.4 \pm 6.41$  kg. Between both HELIOSPHERE® and BIB® gastric balloons, weight loss measures are very close (10.1 kg VS 10.4 kg) but adverse events as nausea and vomiting ( $p < 0.05$ ) and retrosternal burning (15.6% vs 31.4% N.S) are lesser with HELIOSPHERE®. 6 month after removal, EWL is still up to 50% showing an excellent efficiency of gastric balloons coupled with medical recommendations. But main problem is the long term follow up often neglected and without which weight can seriously increase.

**Conclusion:** Gastric balloon can help overweight and obese patients, whom are contraindicated for bariatric surgery, to reduce their weight. Behavior change is essential to avoid putting on weight again.

## THE TANTALUS®: MEAL-ACTIVATED GASTRIC ELECTRICAL STIMULATION IMPROVES GLYCEMIC CONTROL IN OBESE SUBJECTS WITH TYPE 2 DIABETES

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**Background:** The TANTALUS System delivers meal-activated therapy that has been demonstrated to improve glycemic control and body weight in Type 2 Diabetes Mellitus (T2DM) subjects. Improvement in metabolic co-morbidities and glycemic status are presented for subjects that were prospectively enrolled and followed for 6 months under open-label protocols.

**Methods:** 34 overweight and obese subjects (21/13, M/F; BMI: 37±1 kg/m<sup>2</sup>) with T2DM, on oral anti-diabetic medications, but with poor glycemic control were implanted laparoscopically with the TANTALUS System. The system applies GCM (Gastric Contractility Modulation) signals to the antrum of the stomach in synchrony with the native electrical activity

**Results:** To date, 27 subjects have completed 6 months of treatment. The following table summarizes the mean values of major clinical metabolic parameters at baseline and at the end of 6 months. Adverse events were consistent with those associated with similar laparoscopic procedures and were primarily related to the procedure not to the device or to the stimulation.

**Conclusion:** This specific and unique meal-activated stimulation is well tolerated and can positively affect glycemic status, weight and related metabolic co-morbidities.

	Baseline	6 months	Change	N	p-value
HbA1c (%)	8.3	7.3	-1.0	27	<0.001
Weight(kg)	108.4	103.8	-4.6	27	<0.001
Waist circumference (cm)	122.1	116.7	-5.4	27	<0.001
Fasting blood glucose (mg/dl)	176	153	-23	23*	<0.01
Blood pressure (mmHg)	147/92	130/82	-17/-10	25**	<0.001
HDL (mg/dl)	36.7	40.0	3.3	18**	<0.05
LDL (mg/dl)	166	147	-19.5	7**	NS
Triglyceride (mg/dl)	240	197	-42.9	15**	<0.05

\* Data is available from 23 subjects \*\* Analysis of metabolic parameters include only subjects that had abnormal values at baseline for the given parameters as defined for metabolic syndrome.

**P-06.**

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**LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING: WHO BENEFITS MORE?**

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**Background:** Weight loss after LAGB is depended on multiple factors. The standard protocol adopted by most surgeons is a gradual adding of volume in order to achieve the proper level of restriction that permits eating roughly a third of pre- surgery solid intake. The aim of this study is to identify parameters that are involved in the effectiveness of the process

**Methods:** 79 patients underwent LAGB during 2006. The multidisciplinary team was composed of the surgeon, the gastroenterologist, the dietician and the psychologist. The patients were divided into three groups. Group A (42 p) had returned to more than 3 visits to the team, group B (20p)- 3 visits and group C (17 p)- 0-2 visits

**Results:** At the end of the year, group A had a reduction of body mass index (R-BMI) of 5.89 (range 1,2- 10,8), a mean average of visits 5,65 (range 4-9) and a mean average of adjustments 1,55 (range 1-4). Group B had a reduction of BMI of 4,76 (range 1,5- 7,5) and mean average of adjustments 0,8 (range 0-3).

**Conclusion:** BMI reduction is significantly related to the number of patients' visits to the multidisciplinary team, and not strongly related to the number of adjustments or to the fill volume

**P-07.**

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**SAFETY, EFFICACY AND DURABILITY OF LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING IN A SINGLE SURGEON, MEDIUM VOLUME COMMUNITY PRACTICE**

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**Background:** Volume requirements and standardization programs have greatly improved the safety and efficacy of Roux-en-y gastric bypass (RYGBP). Laparoscopic adjustable gastric banding (LAGB) is a less technically demanding operation. Results, however, remain variable with some large centers reporting high failure rates. LAGB has become increasingly popular in community practice which has raised concern in some circles. We report a single surgeon's experience in a medium volume community practice.

**Methods:** From March 30, 2004 to August 31, 2008, a total of 321 patients underwent LAGB. (82% female; mean age 47, range 18-71; mean BMI 48 kg/m<sup>2</sup>, range 35-78). The maximum number of procedures performed in a 12 month period was 104. LAGB was the only bariatric

procedure offered. Patients were seen every six weeks for the first year, every three months for the second year and twice yearly thereafter. Follow up information was available in 96% of patients (95%, 92% and 100% at >36 months, 24 months and 12 months post surgery respectively).

**Results:** The peri-operative mortality was 0%. Average excess weight loss was 30% at 6 months (SD=17), 42% at 12 months (SD=23), 47% at 18 months (SD=24), 54% at 24 months (SD=26), and 55% at >36 months (SD 24). By >36 months, 2 patients (4%) failed to lose at least 25% of their excess body weight. The explantation rate was 3.1%. Gastric prolapse occurred in 2.1% of patients and erosions occurred in 0.6 % of patients.

**Conclusion:** LAGB can be done safely in a community setting with acceptable weight loss and very low failure rates. Our results compare favorably with larger academic practices. LAGB is less technical than RYGBP but results depend heavily on meticulous long term follow up. Low attrition rates and close follow up may be more readily obtainable in a community practice which may partially explain this finding.

## **P-08.**

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### **CORRELATION OF POST-OPERATIVE OFFICE-VISIT COMPLIANCE AND SUCCESS AFTER LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING(LAGB)**

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**Background:** Monthly evaluation is recommended during the first year following LAGB placement to provide appropriate fluid adjustments. A study was undertaken to assess the relationship between office-visit compliance and LAGB success.

**Methods:** The charts of 75 consecutive LAGB patients (> 1 year postop) were retrospectively reviewed. Three patients were lost to follow-up. Age, sex, height, weight, BMI, excess body weight (EBW) and major co-morbid conditions at the time of initial presentation and at 1 year were recorded. Patients with better than 66% compliance were considered compliant (Group A) and the remaining non-compliant (Group B). The characteristics of the groups, their % EBW lost and resolution/improvement of major comorbidities were tabulated and analyzed.

**Results:** Groups A and B were statistically similar ( $p>0.05$ ) with respect to age, sex, height, initial weight/BMI/EBW, 1-year weight/BMI/EBW, as well as initial prevalence of DM 2, hypertension, sleep apnea and hyperlipidemia. The groups were different ( $p<0.05$ ) with respect to number of regular appointments (10.30 vs. 7.13), number of adjustments (5.93 vs. 4.81), decrease in BMI (9.81 Kg/m<sup>2</sup> vs. 6.91 Kg/m<sup>2</sup>) and mean % EBW lost (40.67% vs. 30.54%) at 1 year. Improvement/resolution of comorbidities in groups A and B were 60.5% (26/43) vs. 36.4% (4/11) for hypertension ( $p<0.05$ ), 56.5% (13/23) vs. 22.2% (2/9) for sleep apnea ( $p<0.05$ ), 63.6% (14/22) vs. 50% (3/6) for DM 2 ( $p>0.05$ ), and 76.7% (23/30) vs. 50% (5/10) for hyperlipidemia ( $p>0.05$ ).

**Conclusion:** LAGB success, defined by % EBW lost and resolution or improvement of comorbidities, is closely linked with compliance to monthly evaluations. This may deter patients who are unable to comply with such recommendations from seeking LAGB as a means of

surgical weight loss and persuade insurance carriers to universally provide coverage for such visits.

## **P-09.**

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### **INITIAL EXPERIENCE WITH THE TWO-INCISION LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING**

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**Background:** Newer applications of minimally invasive laparoscopic techniques have been touted as revolutionary. We aim at introducing the two-incision technique for laparoscopic adjustable gastric banding (LAGB) and reporting our experience with 25 consecutive patients.

**Methods:** We introduced a technique for LAGB employing two skin incisions: one in the right upper quadrant (2 cm) that will accommodate 2 trocars (11 and 5mm) through which dissection and implanting the band were undertaken, and a 0.5 cm incision in the left upper quadrant for the 5 mm videoscope. The port was placed in a subcutaneous pocket at the site of right sided trocars. Previously we used a standard five-incision technique: two in the right upper quadrant, two in the left paramedian and one in the sub-xyphoid area for retracting the liver. Data on 25 consecutive two-incision LAGB procedures (10/07 - 04/08) was compared to data on 19 consecutive standard five-incision LAGB procedures (07/07-10/07). Data are mean  $\pm$  standard deviation, t-test was used to compare means,  $p < 0.05$  was considered significant.

**Results:** Mean estimated blood loss in the two-incision LAGB was  $54 \pm 2$  ml compared to  $17 \pm 1$  ml in the standard technique ( $p = 0.040$ ). Mean operating time in the two-incision LAGB was  $120 \pm 1$  minutes compared to  $103 \pm 1$  minutes in the standard technique ( $p = 0.047$ ). There was no mortality or procedure-related complications (erosion, slippage) in the two groups.

**Conclusion:** The two-incision LAGB is feasible; however it is associated with increased operating time and blood loss. Operating time and blood loss may improve with standardization of the operative technique and introduction of newly designed instruments. Further prospective studies with a larger sample size are needed to assess the efficacy and benefit of the two-incision technique vs. the standard technique.

## **P-10.**

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### **PREDICTING HIATAL HERNIA WITH PREOPERATIVE REFLUX SYMPTOMS AND BARIUM ESOPHAGRAM**

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**Background:** Hiatal hernia repair at the time of laparoscopic adjustable gastric banding (LAGB) has been shown to improve outcomes after LAGB and decrease the reoperation rate. We report

on the ability of clinical reflux and barium esophagram to predict the presence of a hiatal hernia. **Methods:** Between January - September 2008, 67 patients underwent laparoscopic adjustable gastric banding (LAGB). A barium esophagram was performed on all patients before surgery. During surgery, a hiatal hernia was actively looked for in all patients. Data were collected prospectively, including reflux symptoms preoperatively, esophagram findings, and presence of hiatal hernia intraoperatively.

**Results:** 67 patients underwent esophagram prior to LAGB. The study was interpreted as positive for hiatal hernia in 16 (23%) patients and negative in 51 (77%). In the operating room, a hiatal hernia was positively noted in 29 cases (43%), and not seen in 38 (57%). Based on this data, the sensitivity and specificity of hiatal hernia diagnosed by esophagram was calculated as 52% and 97%, respectively, for an overall diagnostic accuracy of 78%. There was no correlation between symptomatic reflux disease preoperatively and presence of hiatal hernia intraoperatively ( $p=0.90$ ).

**Conclusion:** A preop esophagram has high specificity but low sensitivity to diagnose hiatal hernia in morbidly obese patients undergoing bariatric surgery. There is no correlation between symptomatic reflux and the presence of hiatal hernia intraoperatively.

## P-11.

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### ESTABLISHING VALIDITY AND RELIABILITY OF A TOOL USED TO MEASURE QUALITY OF LIFE FOR THE BARIATRIC PATIENT

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**Background:** Quality of life (QOL) is an essential outcome marker after health care interventions. A bariatric clinic in Colorado follows over 700 patients who have had Adjustable Gastric Band (AGB) surgery and have used the seven question QOL questionnaire (7QQoLQ) to measure QOL. The purpose of this study was to determine the validity and reliability of this tool.

**Methods:** The population of this clinic were the participants in this study. There were two groups, each with 75 randomly selected participants. Group 1 were surgical candidates, but had not had surgery. Group 2 were at least 6 months post bariatric surgical intervention. Both groups were mailed the SF-12 and the 7QQoLQ and asked to complete these simultaneously. Two weeks later, all participants were mailed another 7QQoLQ. Analysis of the 7QQoLQ included: Construct and Concurrent Validity; Exploratory Factor Analysis; and Test Retest Reliability.

**Results:** The study showed the sample population, with the chronic disease of obesity, differed in normality from the general population. Test retest was significant and established reliability of the 7QQoLQ. The study also showed construct validity, as significantly higher scores were found on the 7QQoLQ for the group who had surgical intervention. Concurrent validity was established as the 7QQoLQ correlated significantly with the SF-12, a tool with known validity. Exploratory factor analysis proved the 7QQoLQ measures mental health, physical health, and personal appearance perception.

**Conclusion:** The 7QQoLQ is designed as a more specific tool for measuring QOL in the bariatric population. It is recommended that the 7QQoLQ continue to be used as a valid and reliable tool for measuring QOL. Opportunity exists to begin studies comparing QOL changes

for the bariatric patient before and after surgical procedures using the 7QoLQ as the measurement tool.

## P-12.

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### **OPERATOR HAND RADIATION EXPOSURE DURING ADJUSTABLE GASTRIC BAND ADJUSTMENT UNDER FLUOROSCOPY**

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**Background:** Adjustable Gastric Band (AGB) placement is becoming the leading treatment modality for the morbidly obese patient. In order to adequately assess the function and efficacy of the band, fluoroscopic guidance during band adjustment is sometimes utilized. We evaluated hand radiation exposure to the operator during band adjustments.

**Methods:** Ring Dosimeters were worn on the dominant hand of clinicians performing twenty-five consecutive band adjustments using the OEC 9400 C-arm. Hand radiation exposure time, total radiation exposure time, and patient demographics were recorded. We analyzed prospectively collected data on this cohort and evaluated factors leading to prolonged hand exposure times and operator safety.

**Results:** 106 patients (87 female/19 male) had AGB adjustments performed by 5 clinicians (4 experienced/1 inexperienced). Ring Dosimetry data available from 2 experienced clinicians is 180mrem/90mrem respectively. Hand exposure times for experienced clinicians average 10.34 seconds, vs. 25.8 seconds for inexperienced clinicians.

**Conclusion:** The mismatch between hand dosimetry and measured hand exposure time may be due to hand position during adjustment. When extrapolated yearly, hand exposure times in experienced operators would be well below the federally regulated extremity exposure limits. Among experienced operators, hand exposure times are not significantly different, however inexperienced operators had 2.5 times the radiation exposure, and may benefit from the use of lead protected gloves.

## P-13.

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### **DOES PARTICIPATION IN POST-OP SUPPORT GROUP AFFECT OUTCOMES AFTER LAP-BAND SURGERY IN MEDICAID PATIENTS?**

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**Background:** Introduction: We hypothesize that Medicaid patients undergoing Lap-Band surgery who attend post-op support group meetings will experience greater weight loss than those who do not attend.

**Methods:** Methods: A retrospective study was conducted using the results of 64 patients who underwent the Lap-Band between January and September 2008 in a large public hospital. Data on all patients were collected prospectively, including demographic information, weight loss and attendance. Patients were strongly encouraged to attend support group meetings once a month, conducted by the bariatric team.

**Results:** Results: Mean preop age and BMI were 43 years (20-61) and 44 kg/m<sup>2</sup> (35-50), respectively. By race/ethnicity: 58% were Latin-American, 14% African-American, 3% White, and 25% other. 89% had Medicaid insurance. Mean %EWL was 22% and 31% at 3 and 6 months, respectively, with follow-up rates of 83% (39/47) at 3 months and 88% (22/25) at 6 months. When %EWL was stratified based on attendance of at least 1 support group session vs. no attendance, no difference was seen at 3 months (21% vs. 24%, p=0.31) or 6 months (25% vs. 35%, p=0.11). When %EWL was stratified based on attendance of at least 2 support group sessions vs. no attendance, still no difference was seen at 3 months (24% vs. 22%, p=0.60) or 6 months (27% vs. 30%, p=0.64).

**Conclusion:** Conclusion: In a primarily Medicaid population undergoing the Lap-Band, we found no significant difference in %EWL between patients who attended the post-op support groups and those who did not. Further follow-up is required to determine if a difference truly exists.

#### P-14.

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### **TECHNICAL CHALLENGES OF TWO APPROACHES TO SINGLE INCISION LAPAROSCOPIC GASTRIC BANDING PLACEMENT**

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**Background:** To improve cosmesis and reduce the disability associated with current laparoscopic operations, single incision laparoscopic surgery has been advocated and performed in select populations. We describe two approaches to performing single incision laparoscopic gastric banding, and the technical advantages and disadvantages of each approach.

**Methods:** Patients with BMI between 41-44 underwent single incision laparoscopic gastric banding using two approaches: incision at right upper quadrant (RUQ) vs. umbilicus. A 4-cm incision was made to accommodate 4 ports (2 working ports, liver retractor, and laparoscope) arranged in a diamond configuration for both approaches.

**Results:** The technical aspects of the two approaches including instrumentation will be discussed and illustrated in videos. The umbilicus approach required a longer laparoscope and liver retractor. The technical challenges were similar for both approaches given limited working space of trocar placements. However, the visualization for the umbilicus approach was more limited due to the angle of the camera port and the longer distance from the incision to the working surgical field. Lastly, the RUQ approach had a more visible scar. The operative time was similar for both approaches and there were no intraoperative complications.

**Conclusion:** Both RUQ and umbilicus single incision laparoscopic gastric banding approaches are safe and effective but each has its own merits and challenges. Starting with a RUQ approach and transitioning to an umbilical approach may be useful while developing comfort with the

technical challenges of single incision laparoscopic banding.

## P-15.

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### **CLINICAL EVALUATION OF THE LAP-BAND AP® SYSTEM IN THE SEVERELY OBESE: INTERIM ANALYSIS OF THE APEX STUDY**

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**Background:** The LAP-BAND AP® System (AP Band, Allergan, Irvine, CA) was developed based on surgeon's feedback to improve overall performance made available to US surgeons in July 2007. However, no US data including the AP Band have been reported yet and few prospective, multi-center studies have been published within the bariatric surgical literature. The purpose of this study was to prospectively evaluate safety and efficacy of the AP Band in a real-world clinical setting. This report is an interim analysis of safety and efficacy.

**Methods:** Multicenter, prospective, open-label, 5-year evaluation of 500 severely obese patients undergoing AP Band surgery. This report includes the patients (n=166) who have completed 24 weeks of follow-up and includes a subset (n=29) who have completed 48 weeks of follow-up. Reported outcomes included percentage excess weight loss (%EWL) and incidence of adverse events. Additional variables will be reported in subsequent analyses.

**Results:** No serious device-related adverse events or mortality occurred. One hundred sixty-six patients have completed 24 weeks; mean baseline weight was 274.7 ±55.5 lbs. At week 24, the %EWL for those patients was 34.1 ± 14.6%. The subset of patients who reached 48 weeks post-op (n=29) had a mean baseline weight of 249.5 ±30.6 lbs. At 48 weeks, mean %EWL in this subset was 49.6 ± 20.2.

**Conclusion:** As illustrated by these preliminary results, the AP Band System safely and effectively reduces weight in severely obese patients. No serious device-related adverse events were reported. Additional follow-up is ongoing.

## P-16.

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### **LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING (LAGB) FOR SUPER OBESE (BMI>59): SHORT TERM RESULTS**

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**Background:** Although LAGB is an effective and least invasive procedure for weight loss, its use is controversial in super obese patients with a BMI>59. For the purpose of this study, data was compiled for super obese patients (BMI >59) undergoing LAGB for weight loss at a single center and their post operative course. The effectiveness of the procedure was measured by analyzing the short term (1year) estimated weight loss (EBWL %) for each patient.

**Methods:** We performed 435 LAGB between April 2005 - July 2008 for BMI 31- 67. We divided patients into two groups - one with BMI > 59 (n=16) and the other with BMI < 59 (419) and studied their outcome.

**Results:** The average length of stay was 1-2 days. There were no post operative complications encountered in either group. All (n=435) had post operative gastrografin swallow evaluation with no signs of leakage or obstruction. There was no mortality. At 1 year follow up the EBWL% for BMI > 59 was 26.1 % ( 2-44%) as compared to 35 % ( 2-88%). In Super obese group 3 patients did not follow up after 3 months; 2 patients had initial weight gain at 6 months follow up with EBWL 2 -9% at 1 year. There were no incidences of pouch dilatation, band migration or band leakage in any of the patients.

**Conclusion:** The short term results for the super obese patients undergoing LAGB is comparable to the results achieved by other patients. In experienced hands, the post operative course including complications, are no different than in patients with low BMI (<59). LAGB should be offered to super obese as an effective and safe weight loss procedure.

**P-17.**

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### **EATING AND BAND TIGHTNESS AFTER LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING FOR MORBID OBESITY-TEN YEARS EXPERIENCE**

*Eliezer Avinoah, MD; Surgery A, Soroka medical center, Metar, Israel*

**Background:** weight loss after laparoscopic gastric banding depends on band tightness. We follow the eating capability of patients three to ten years after surgery in correlation with band tightness and its influence on gastro esophageal function.

**Methods:** We performed 6000 laparoscopic gastric banding for morbid obesity during the last ten years, 2800 of whom were performed before the end of 2005 (more than three years after surgery). Their mean BMI was  $43 \pm 4$  and their mean age  $38 \pm 7$  (age range 9-72 years old). The pars flaccida technique was used with the same band without gastro-gastric sutures. We began the band adjustments one month after surgery and continue every month until weight loss rate reaches 0.5 to one kg. per week.

**Results:** Present survey shows that BMI remains stable below 29 even more than eight years after surgery. We found prominent change in esophageal function depending on band inflation. At stage I- there is slower eating, with ability to eat everything. At stage II - inability to eat certain kinds of doughy food. Stage III - periodic eating, eating restricted to evening, long-term morning satiety. Stage IV - there is inhibition of swallow reflex, eating and drinking depend on self esophageal motility activation. Drinking can be difficult than eating.

**Conclusion:** More than three years after surgery, shows that in addition to their severe eating restriction patients have strong sense of fullness. Band tightness was found to cause satiety by controlling not only gastric stoma but also the swallowing reflex and slowing gastro esophageal peristalsis.

**P-18.**

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## **DIFFERENTIAL LOSS OF FAT AND LEAN MASS IN THE MORBIDLY OBESE AFTER BARIATRIC SURGERY**

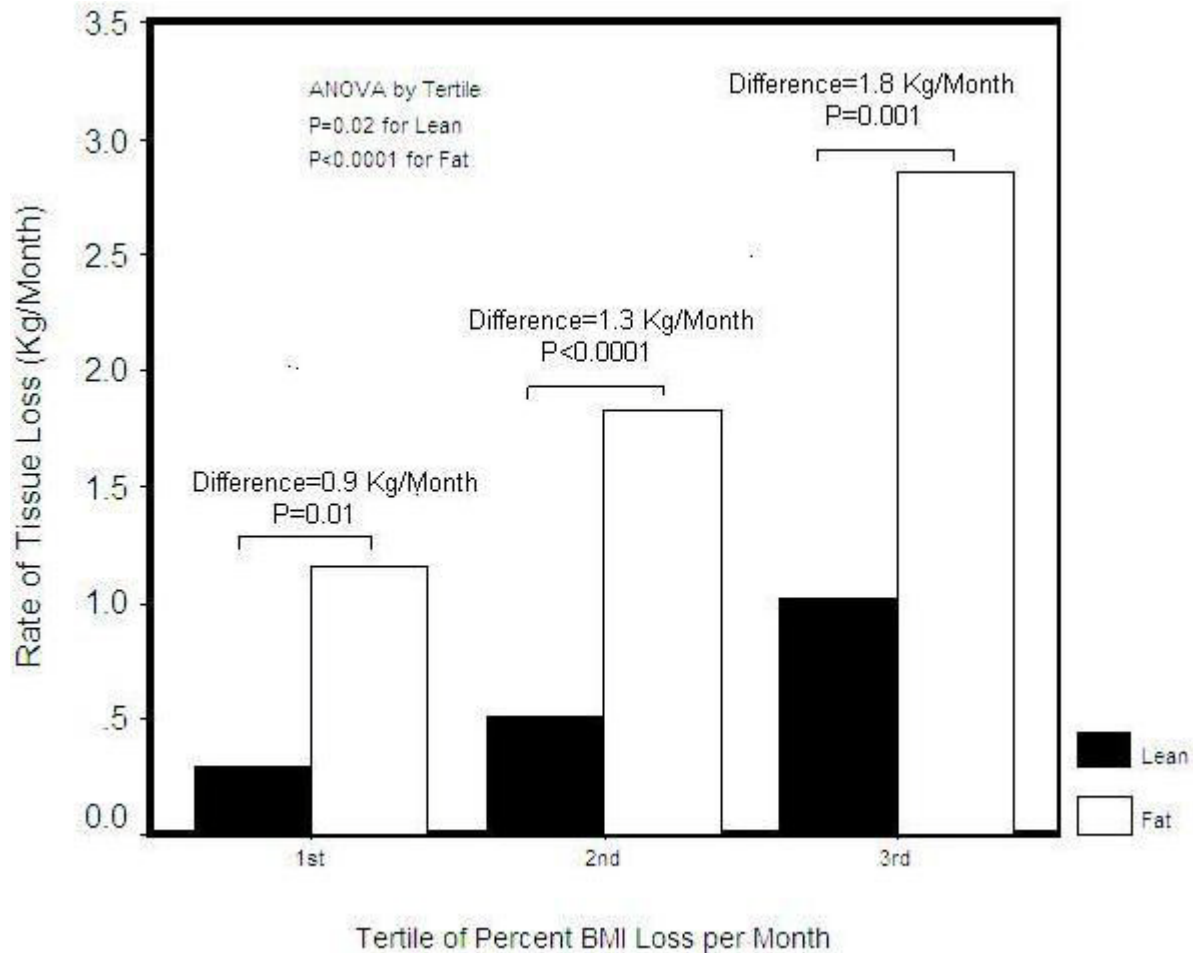
*Kerstyn C. Zalesin, MD; Nutrition and Preventative Medicine, William Beaumont Hospital, Royal Oak, MI, USA*

**Background:** Bariatric surgery has become a common treatment for morbid obesity. The relative changes in body tissue that comprise the substantial weight loss over time are not completely understood.

**Methods:** We evaluated the differential rates of fat and lean tissue losses in morbidly obese patients who underwent Roux-en-Y gastric bypass surgery. Body composition was assessed using whole-body dual energy x-ray absorptiometry (DXA) performed at two time-points in the post-operative period. Patients were stratified by the tertile of rapidity of weight loss expressed as percent reduction in body mass index per month

**Results:** Thirty two patients (25 women, 7 men) with a mean age of  $46.7 \pm 10.4$  years and an average initial body weight of  $141.4 \pm 29.4$  kg experienced a  $52.3 \pm 16.6$  kg ( $36.5 \pm 5.5\%$ ) weight loss over  $13.9 \pm 6.0$  months. The incremental rates of lean body mass loss by tertiles were  $0.3 \pm 0.6$ ,  $0.5 \pm 0.2$ , and  $1.0 \pm 0.8$  kg/month,  $p=0.02$ , whereas the rates of fat loss were  $1.2 \pm 0.9$ ,  $1.8 \pm 0.4$ , and  $2.9 \pm 1.0$  kg/month,  $p=0.0001$ . The ratios for lean to fat loss among the respective tertiles were 1:4.0, 1:3.6 and 1:3.0. The correlation between rates of lean and fat mass loss was  $r=0.37$ ,  $p=0.04$ . Only three of the 32 patients (9.4%) patients maintained or gained lean mass following Roux-en-Y gastric bypass surgery.

**Conclusion:** After bariatric surgery, those patients losing weight at the greatest rate demonstrate accelerated losses of both lean and fat mass. Few patients maintain lean body mass after bariatric surgery, despite self-reported participation in conventional exercise programs. These data suggest the need for more aggressive interventions to preserve lean body mass during the weight loss phase after Roux-en-Y gastric bypass surgery



P-19.

### LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: USING SBMI AS A PREDICTOR OF SUCCESS AND FAILURE

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**Background:** Laparoscopic roux-en-y gastric bypass is a common procedure used for the treatment of morbid obesity. High starting BMI is a predictive risk factor to failure to lose significant percent excessive weight after adjustable gastric banding. The purpose of this study is to evaluate if that is also the case for laparoscopic RYGB.

**Methods:** We retrospectively examined 793 patients who underwent laparoscopic RYGB for morbid obesity between March, 2002 and August, 2008. These patients were stratified into groups based on their sBMI. The percent excess weight loss (%EWL) was calculated on their 1, 3, 6, 9, 12 month visits. The %EWL of each group was evaluated over time and compared to one another.

**Results:** The %EWL was related to time in a linear fashion ( $R^2 > 0.95$ ) for all groups. The %EWL at one year between groups with BMIs in the 30s, 40s, 50's, and 60's was 79.6%, 80.8%,

64.6% and 56.2%, respectively. The calculated y-intercept demonstrated the relationship between the groups and did not have a correlation,  $R^2 = -0.59$ .

**Conclusion:** These results reconfirmed published results that patients with higher sBMIs have smaller %EWL over time. Since there is no correlation between the calculated y intercept for the stratified sBMI groups and their BMIs, we cannot use sBMI as predictor of surgical success.

## P-20.

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### MID-TERM OUTCOMES OF ROUX-EN-Y GASTRIC BYPASS ON VERTICAL BANDED GASTROPLASTY

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**Background:** Since 2002, we developed the Roux-en-Y Gastric Bypass on Vertical Banded Gastroplasty (RYGB-on-VBG) in open surgery. In the short-term the procedure has resulted to be effective; the weight loss curve was similar to standard RYGB, while allowing the traditional x-ray and endoscopy of the bypassed stomach. In this study mid-term outcomes were evaluated.

**Methods:** From June 2002 to June 2008, 232 patients, 173 female and 59 male, with age  $42.02 \pm 11.57$  SD years, BMI  $48.42 \pm 8.48$  SD kg/m<sup>2</sup> underwent RYGB on VBG via an open approach. The preoperative comorbidities were hypertension (45.68 %), hyperlipidemia (35.0 %). OSAS (25.0 %), and type II DM (13.5 %). Follow-up was scheduled at 3, 6, and 12 months, and annually thereafter, and included: clinical control and blood examinations; x-ray study with barium; upper endoscopy if needed.

**Results:** The mean preoperative BMI decreased from  $48.4 \pm 8.4$  kg/m<sup>2</sup> to  $35.3 \pm 6.2$ ,  $32.7 \pm 5.8$ ,  $31.6 \pm 5.9$ ,  $31.2 \pm 6.1$ ,  $32.4 \pm 6.8$  and  $32.2 \pm 6.5$  kg/m<sup>2</sup> after 6 months and 1, 2, 3, 4 and 5 years, respectively. The percentages resolution of comorbidities were: OSAS 89%; type II DM 83%; hypertension 45%; hyperlipidemia 30%. For every patient followed-up, the radiographic studies and/or a gastroscopy provided the details of the postoperative anatomy, including the bypassed stomach and duodenum.

**Conclusion:** Even at medium-term the outcomes of RYGB-on-VBG have been good. The weight loss curve and the resolution of comorbidities were comparable to standard RYGB; moreover this procedure enables traditional diagnostic evaluation of the stomach, which is only functionally excluded.

## P-21.

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### COMPARATIVE ANALYSIS OF GASTROJEJUNOSTOMY STRICTURE RATES BETWEEN 25-MM EEA CIRCULAR STAPLERS DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS

*Michael Valente, DO; Adrian G. Dan, MD; Debbie Pasini, RN, BSN, CBN; John Zografakis, MD; Bariatric Care Center, Department of Surgery, Summa Health System, Akron, OH, USA*

**Background:** Gastrojejunostomy stricture, a known complication of laparoscopic roux-en-y gastric bypass (LRYGB), occurs in 3 to 27% of patients and often requires endoscopic balloon dilation. An immediate decrease in the stricture rate was noted after implementation of a circular stapler with an increased luminal diameter of 1.2 mm, equivalent to 16.3% increase in the area of the anastomosis. As a result, a study was undertaken to determine the stricture rates between the two models of circular staplers.

**Methods:** A retrospective review of prospectively gathered data was completed in order to compare stricture rates in 290 consecutive patients after use of the conventional stapler (Group A - 12/04 to 5/07) and use of the re-engineered stapler (Group B - 5/07 to 12/07). All patients underwent a standardized LRYGB with trans-oral introduction of the anvil. The mean age, sex, pre-op BMI, length of stay, and stricture rates for Groups A and B were calculated and statistically compared.

**Results:** Group A (n=180) and Group B (n=110) were similar with regards to average age (44.5 vs. 44.5 yrs. -  $p>0.05$ ), sex distribution (82.2 vs. 80.8% female -  $p>0.05$ ), BMI (49.6 vs. 48.9 kg/m<sup>2</sup> -  $p>0.05$ ), and LOS (2.20 vs. 2.14 days -  $p>0.05$ ). However, the groups were statistically different with respect to stricture rate (11.6% vs. 4.5% -  $p<0.05$ ).

**Conclusion:** Use of the larger diameter stapler is associated with a significant decrease (61%) in the rate of postoperative stricture at the gastrojejunostomy during LRYGB. This comes without a change in the clinical outcome of patients and is important to consider when choosing a stapler with which to construct a circular anastomosis.

P-22.

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### **DIFFERENCES IN WEIGHT-LOSS OUTCOMES BETWEEN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS (LRYGB) PATIENTS AND LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING (LAGB) PATIENTS EXCEED THOSE IN PREVIOUSLY REPORTED STUDIES**

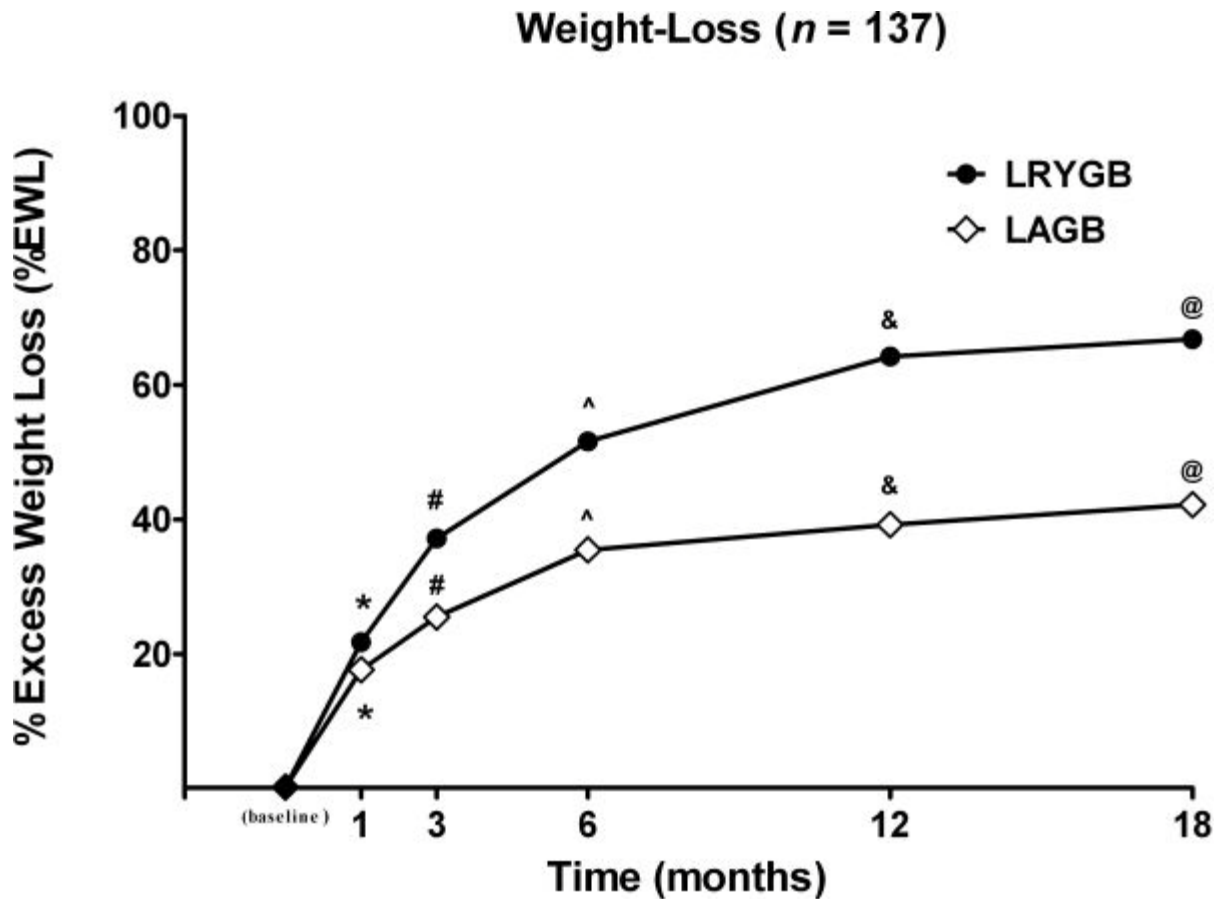
Rachael J. Pohle-Krauza, PhD, RD, LD<sup>1</sup>; Adrian G. Dan, MD<sup>2</sup>; Debbie Pasini, RN, BSN, CBN<sup>2</sup>; Michelle L. McCarroll, PhD<sup>3</sup>; Eric Bader<sup>3</sup>; Shayne York<sup>3</sup>; John Zografakis, MD<sup>2</sup>; <sup>1</sup>Human Ecology, Youngstown State University, Youngstown, OH, USA; <sup>2</sup>Bariatric Care Center, Department of Surgery, Summa Health System, Akron, OH, USA; <sup>3</sup>Human Performance and Exercise Science, Youngstown State University, Youngstown, OH, USA

**Background:** LRYGB and LAGB are two common surgeries for obesity and previous studies have demonstrated that weight-loss outcomes for bypass exceed those of banding by 20 - 34%. We sought to examine interactive effects of surgical procedure and sex, on loss of excess weight over time, in a cohort of bariatric surgery patients.

**Methods:** : A retrospective review was performed of 413 patients who underwent LRYGB or LAGB at a single institution between 2005 and 2007. Of these, 137 patients had values for all time points for body weight at baseline (preoperatively), and one, three, six, twelve and eighteen months postoperatively. Data were analyzed using SAS 9.1, where effects on percent of excess weight lost (%EWL) were tested in mixed models with sex, surgical procedure and time, and all possible interactions of the three entered as factors.

**Results:** A main effect of sex was found, where on average, men (n=27) had greater %EWL than women (n=110) (22.5±8.1% versus 19.8±7.0%). A significant two-way interaction was found between surgical procedure and time. %EWL was significantly greater in the LRYGB group (n=88) compared to the LAGB group (n=49) at one month (21.8±7.2% versus 17.7±6.7%), three months (37.2±9.2% versus 25.5±9.7%), six months (51.6±12.8% versus 35.5±23.3%), 12 months (64.2±16.5% versus 39.2±14.5%), and 18 months (66.7±17.6% versus 42.2±16.3%), postoperatively.

**Conclusion:** Our results demonstrate that excess weight loss in LRYGB patients surpassed those of LAGB patients by approximately 39% at 12 months and 36% at 18 months after surgery. This difference in weight loss exceeds estimates reported in some previous studies.



Percent excess weight loss (%EWL) outcomes by time and surgery type. A significant two-way interaction was found between time and type of surgery ( $P < 0.0001$ ). Like symbols indicate significant differences in %EWL between surgery groups (all  $P$ 's  $\leq 0.01$ ).

P-23.

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**CHANGES IN THE LIPID PROFILE OF LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS (LRYGB) PATIENTS COMPARED TO LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING (LAGB) PATIENTS**

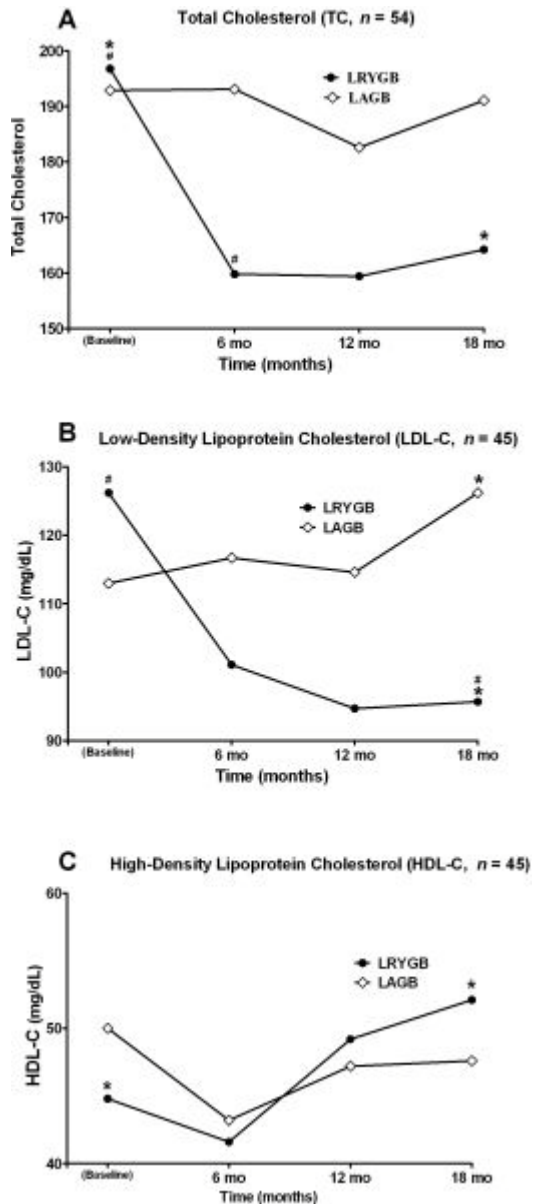
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**Background:** Abnormal blood lipids have been shown to be strongly associated with cardiovascular risk. Previous studies have reported favorable effects of weight-loss surgery on blood lipid concentrations. We investigated the effects of type of surgical procedure and sex on changes in the lipid profile.

**Methods:** A retrospective review was performed of 413 patients who underwent LRYGB or LAGB at a single institution between 2005 and 2007. Of these, approximately 50 patients had values for all time points for Total, HDL- and LDL-cholesterol concentrations at baseline (preoperatively), and six, twelve and eighteen months postoperatively. Data were analyzed using SAS 9.1, where effects on lipid concentrations were tested in mixed models with sex, type of surgical procedure, time, and all possible interactions of the three entered as factors.

**Results:** Significant two-way interactions were found between surgery type and time for lipid parameters. TC and LDL-C significantly decreased between baseline and all time points in the LRYGB patients, but did not decrease from baseline at any time point in the LAGB group. HDL significantly decreased between baseline and six months, and remained lower than baseline values at twelve and eighteen months in the LAGB group. In contrast, HDL-C concentrations in the LRYGB group were significantly greater than baseline values at both twelve and eighteen months postoperatively. There were no main or interactive effects of sex.

**Conclusion:** Type of surgery differentially affects blood lipid concentrations, likely through effects on of body weight and insulin sensitivity. Further studies are needed to replicate these findings in larger samples and to assess long-term outcomes.



P-24.

## A COMPARISON OF RESULTS OF DA VINCI ROBOT ASSISTED RNY GASTRIC BYPASS WITH LAPAROSCOPIC RNY GASTRIC BYPASS PROCEDURES

Amjad Ali, MD; Bariatric Surgery, Hamot Medical Center, Erie, PA, USA

**Background:** Roux-en-Y (RNY) gastric bypass surgery is the most common weight loss operation for morbid obesity in USA. The objective of this study is to evaluate the early results after Da Vinci assisted RNY and Laparoscopic (lap) RNY performed by the same surgeon at a bariatric surgery center of excellence (COE).

**Methods:** A prospective database (Lapbase®) is maintained on all patients undergoing bariatric surgeries at Hamot Medical Center. Lap RNY procedures involved creation of gastrojejunostomy

(GJ) using 25 mm of a 30 mm long linear stapler. Starting in March 2006, Da Vinci was used for creation of GJ.

**Results:** 304 patients underwent bariatric surgery by one surgeon at Hamot Medical Center between March 2006 and April 2008. Out of that 178 patients underwent RNY procedures. 87(49%) RNY procedures were performed with Da Vinci(Group 1). During the same period, 91(51%) were performed without it by the same surgeon (Group 2). There were 77(88%) female patients in group 1 and 72(79%) in group 2. Average BMI at presentation was 47(35-73) in group 1 and 49(35-74) in group 2.

**Conclusion:** Da Vinci assistance is a safe and feasible alternative for creation of GJ during RNY procedures. In this study, the use of the robot increased OR duration by an average of 43 minutes. All anastomosis related complications with the exception of leaks (both encountered during the first 35 cases) were less frequent in Da Vinci group.

#### Da Vinci Assisted RNY GBP vs Lap. RNY GBP

	Group 1	Group 2
Numbers	87(49%)	91(51%)
Duration	227 minutes	184 minutes
Leaks	2(2.2%)	0
Bleeding	0	0
Stenosis	4(4.5%)	8(8.7%)
Marginal ulcers	4(4.5%)	7(7.6%)

Group 1= Da Vinci RNY GBP, Group 2= Lap RNY GBP

#### P-25.

### ANTERIOR VERSUS TRANS-STAPLE LINE GASTROJEJUNOSTOMY. MOVING TOWARDS AN OPTIMAL TECHNIQUE

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**Background:** Concerns about ischemic areas around the anteriorly placed circular anastomosis (anterior) in the pouch led to a new technique involving a circular anastomosis through the staple line in the pouch (trans-staple). The purpose of this study is to compare the anterior and trans-staple line techniques and contrast the stricture and leak rates between the two styles.

**Methods:** A retrospective review of 1097 patients undergoing laparoscopic RYGB between 2003 and 2008 was performed. We compared two separate techniques for the gastrojejunostomy anastomosis. In all cases a 25mm circular anastomosis was made with an antecolic antegastric roux limb. Overall stricture and leak rates were compared.

**Results:** 143 patients undergoing the trans-staple line anastomosis were compared to 954 patients having the circular anastomosis anterior to the staple line. The trans-staple line anastomosis was significantly better than the anterior when comparing leak rate (0% vs 0.31%)

and stricture rate (2.79% vs 7.9%). There was no significant difference in bleeding rates (1.39% vs 1.46%) or percent excess body weight loss at 12 months (86.3% vs 78.2%).

**Conclusion:** This study demonstrates a novel technique for a trans-staple line anastomosis that significantly decreases the incidence of strictures and leaks.

## P-26.

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### CHANGES IN BONE MINERAL DENSITY AND BODY COMPOSITION FOLLOWING ROUX-EN-Y GASTRIC BYPASS SURGERY

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**Background:** Roux-en-Y gastric bypass (RYGB) surgery is an effective treatment for morbid obesity and its comorbid medical conditions. RYGB can lead to nutritional and metabolic deficiencies related to decreased oral intake and micronutrient malabsorption. Vitamin D deficiency in the morbidly obese coupled with decreased calcium absorption following surgery may lead to osteomalacia and osteoporosis after RYGB. The aim of this study is to evaluate changes in bone mineral density (BMD) and body composition following RYGB.

**Methods:** Twenty white females who underwent RYGB surgery were assessed pre- and postoperatively with nutritional measurements and dual-energy x-ray absorptiometry (DXA).

**Results:** The participants were 45±10 years of age and underwent RYGB surgery 792 ±110 days prior to postoperative DXA imaging. Average lumbar t-score (0.35 unit decrease), neck t-score (0.71 unit decrease), neck z-score (0.60 unit decrease), body weight (30% decrease), bone mineral content (10% decrease), fat mass (40% decrease), lean body mass (18% decrease), and percent body fat (17% decrease) significantly decreased following surgery (p-values<0.0001). The percent of neck t-scores in the osteopenic range (pre 15% pre vs post 35%, p=0.046) and total body t-scores in the osteopenic range (pre 5% vs post 25%, p=0.046) increased following surgery.

**Conclusion:** After RYGB, women in this study lost not only significant fat mass as expected, but also significant bone mineral content and lean body mass. The change in bone mineral content may account for the increased rate of postoperative osteopenia though other factors such as age and menopausal status may play a role.

## P-27.

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### A PROFILE OF READINESS TO CHANGE, MOTIVATION, AND MOOD REGULATION IN BARIATRIC SURGERY CANDIDATES

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*Center, Rochester, NY, USA; <sup>2</sup>Bariatric and GI Surgery, University of Rochester Medical Center, Rochester, NY, USA*

**Background:** Readiness to change, feelings of control over health behaviors, and ability to regulate mood before bariatric surgery may play an important role in treatment adherence and influence outcomes post-surgery.

**Methods:** Participants completed the University of Rhode Island Change Assessment (URICA), the Treatment Self-Regulation Questionnaire of Autonomous and Controlled Motivation (TSRQ), and the Negative Mood Regulation (NMR). The URICA, a 5-point scale, ranges from 1 (strongly disagree) to 5 (strongly agree). The TSRQ ranges from 1 (strongly disagree) to 7 (strongly agree). Lastly, the NMR has scores ranging from 30 to 150, with higher scores indicating a stronger belief in ability to alleviate negative mood.

**Results:** Participants included 41 women and 13 men, with a mean age of 50.9 ( $\pm 7.9$ ) and BMI of 49.1 kg/m<sup>2</sup> ( $\pm 9.2$ ). Mean scores for the URICA were: pre-contemplative 2.14 ( $\pm .87$ ), contemplative 3.9 ( $\pm .63$ ), action 4.1 ( $\pm .42$ ) and maintenance 3.4 ( $\pm .53$ ). Mean TSRQ-A scores for diet and exercise were 6.4 ( $\pm .63$ ) and 6.2 ( $\pm .92$ ), respectively. Mean TSRQ-C scores for diet and exercise were 3.6 ( $\pm 1.4$ ) and 3.2 ( $\pm 1.4$ ). The total NMR score was 104.4 ( $\pm 15.6$ ).

**Conclusion:** This preliminary profile of surgery candidates suggests that they have moderate to high motivational readiness to change and feel that their decision for change is motivated by personal choice over external factors. Participants report an average level of confidence in their ability to utilize effective coping skills to regulate negative mood states. Future analyses will examine how this pre-surgical profile affects outcomes post surgery.

**P-28.**

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### **CASE REPORT: MINIMALLY INVASIVE TREATMENT OF SMA SYNDROME AFTER LAPAROSCOPIC ROUX-Y GASTRIC BYPASS**

*Shawn Steen, MD; Joseph A. Kuhn, MD; Department of Surgery, Baylor University Medical Center, Dallas, TX, USA*

**Background:** Superior Mesenteric Artery (SMA) Syndrome is an uncommon but well described entity. The syndrome is caused by compression of the third portion of the duodenum by the superior mesenteric artery and aorta from a loss of retroperitoneal fat in this area.

**Methods:** We present a unique approach to treatment of this problem by performing a laparoscopic minimally invasive duodenojejunostomy.

**Results:** A 21 year old female underwent Roux-en-Y gastric bypass for morbid obesity with a BMI of 52. Her excess body weight lost was over 100% with a BMI of 22 when she began having problems with vague abdominal pain and nausea related to meals. Her failure to thrive eventually led to placement of a gastrostomy tube into the remnant stomach. She began to have postprandial nausea and pain. A CT scan showed dilation of the gastric remnant with a tapering at the third portion of the duodenum suggesting a possible diagnosis of SMA Syndrome. A laparoscopic retrocolic side-to-side loop duodenojejunostomy was performed. Postoperatively, a contrast study was performed through the gastrostomy tube and showed rapid transit through the duodenojejunostomy. The patient was able to resume gastrostomy tube feeds without symptoms.

She is doing well now two years after surgery.

**Conclusion:** The diagnosis of SMA Syndrome may be an important and often overlooked etiology of chronic abdominal pain after weight loss surgery. It may be a source of persistent abdominal discomfort in these patients when other sources have been ruled out.

## **P-29.**

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### **LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS (RYGB) IN PATIENTS WITH MALROTATION**

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**Background:** 90 percent of cases of malrotation are identified prior to age 1, however a small subset of patients may make it to adulthood without clinical symptomatology. Identifying and modifying surgical technique at time of RYGB is important to avoid creating extremely distal RYGB.

**Methods:** A retrospective chart review of 5635 patients that underwent RYGB between September 1, 1999 and October 31, 2008 identified 13 patients with malrotation. 3818 operations were performed open and 1817 were performed laparoscopically. Of the 13 patients with malrotation, 10 patients were identified at time of planned open RYGB and three patients were identified at time of laparoscopic approach. Operation was modified to include lysis of Ladd's bands, appendectomy and paracolic perigastric RYGB.

**Results:** The first of the three laparoscopic operations was converted to open procedure and recovered uneventfully. The subsequent two operations were completed laparoscopically including lysis of Ladd's bands, appendectomy and 100cm RYGB. Both patients completed laparoscopically recovered uneventfully. All 13 patients have done well without any RYGB or malrotation related postoperative complications.

**Conclusion:** In our experience, malrotation occurs in one out of 500 patients undergoing RYGB. Bariatric surgeons need to be aware of the incidence of malrotation and be prepared to modify operation to avoid creation of extremely distal RYGB. This can be done safely in a laparoscopic setting.

## **P-30.**

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### **INTESTINAL OBSTRUCTION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: ANTECOLIC VERSUS RETROCOLIC ROUX LIMB**

*Arthur M. Carlin, MD, FACS; Amber Warnat, BS; Department of Surgery, Henry Ford Hospital, Detroit, MI, USA*

**Background:** Intestinal obstruction has become more common with utilization of the laparoscopic technique during gastric bypass for the treatment of morbid obesity. Controversy exists regarding the optimal course for the alimentary limb to reduce the incidence of intestinal

obstruction during laparoscopic Roux-en-Y gastric bypass (LGBP).

**Methods:** A total of 539 patients underwent LGBP between May 2004 and December 2005. The Roux limb was positioned antecolic in 240 and retrocolic in 299. All mesenteric defects were closed in the retrocolic technique. The Roux limb mesenteric defect (Peterson's space) was not closed during the antecolic technique.

**Results:** The mean age was  $43 \pm 10$ ; 86% were women and 71% Caucasian. The mean preoperative BMI was  $49 \pm 6$ . The mean %EWL at 12 months postoperatively was 66%. The operative time was significantly shorter with the antecolic (123 minutes) as compared to the retrocolic (147 minutes) technique ( $P < 0.001$ ). Of the 539 patients 8 (1.5%) required reoperation for intestinal obstruction. There was no difference in the rate of intestinal obstruction between the antecolic (0.8%) and retrocolic (2.0%) Roux positions. Both of the intestinal obstructions after antecolic LGBP were internal hernias at Peterson's space, whereas 83% of intestinal obstructions after retrocolic LGBP were due to problems at the mesocolic defect (hernia, stricture, rotation). The mean time to reoperation was 509 and 62 days in the antecolic and retrocolic groups, respectively ( $P = 0.005$ ).

**Conclusion:** No difference in the incidence of intestinal obstruction was identified between the antecolic and retrocolic technique, however, the site of obstruction was different. With antecolic positioning of the Roux limb operative time was reduced and intestinal obstruction occurred more remote from LGBP.

## P-31.

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### **SURGICAL RESIDENTS CAN SAFELY PARTICIPATE IN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS**

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**Background:** Laparoscopic Roux-en-Y gastric bypass (LGBP) has become the most common surgical technique for treatment of morbid obesity in the United States. Most bariatric surgeons utilize dedicated assistants or fellows during performance of LGBP due to the technical difficulty of this operation. At our teaching institution residents participate in approximately half the cases. The aim of this study was to determine the effect of resident participation on postoperative complications.

**Methods:** A total of 539 patients underwent LGBP between May 2004 and December 2005. The intracorporeal handsewn technique was used for both the gastrojejunostomy (two-layer handsewn) and jejunojejunostomy (linear stapler with handsewn closure of enterotomy) without the aid of a suturing device. Surgical residents and physician assistants (PA) participated in 309 and 230 LGBP operations, respectively. Based on laparoscopic skill level residents acted as the operating surgeon for specified portions of the procedure.

**Results:** The mean preoperative BMI was  $49 \pm 6$ . The mean %EWL at one year postoperatively was 66%. There were no differences in preoperative age, gender, BMI, abdominal circumference, and prior abdominal surgery or postoperative length of stay and %EWL between the resident and PA groups. The operative time was significantly shorter in the PA group (137 minutes) as compared to the resident group (185 minutes) ( $P < 0.001$ ). A total of 48 patients

developed complications (8.9%). The overall complication rate was lower in the resident as compared to the PA group (6.8% vs 11.7%;  $p = 0.048$ ), but the incidence of complications requiring reoperation was the same (4.9% vs 4.8%).

**Conclusion:** Surgical residents can safely participate in LGBP without an increase in complications. Operative time was increased by one hour when residents were involved with the procedure.

## P-32.

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### **SLEEP APNEA SYNDROME (SAS) IS SIGNIFICANTLY UNDERDIAGNOSED IN GASTRIC BYPASS PATIENTS: A STUDY OF 834 PATIENTS**

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**Background:** Devastating morbidity and mortality can result when patients with undiagnosed sleep apnea syndrome (SAS) undergo gastric bypass (GBP). This study evaluates the prevalence of SAS and its rate of non-diagnosis in GBP patients.

**Methods:** Demographic, anthropomorphic, and comorbidity data were collected on 1,368 patients evaluated for bariatric surgery. All patients were screened for symptoms of SAS, and symptomatic patients were evaluated with polysomnography.

**Results:** On initial presentation, 479 (35%) of the 1,368 patients had established diagnosis of SAS, while 225 (16%) were symptomatic but had not been previously evaluated. At the time of this study, 834 patients (61%) had completed the preoperative evaluation. Among these patients, 210 (25%) presented with previously diagnosed SAS. An additional 174 patients (21%) exhibited symptoms of SAS and underwent polysomnography. The majority of patients tested (127, 73%) indeed had SAS which required treatment, while 11 patients (6%) had mild SAS not requiring treatment and 36 (21%) tested negative for SAS. Thus, symptom screening for SAS had a positive predictive value (PPV) of 79% for predicting the presence of SAS and 73% for identifying patients who need treatment for SAS. Patients with SAS tended to be older, male and have a higher BMI ( $p < 0.05$ ).

**Conclusion:** Overall, SAS that required treatment with an oral appliance was prevalent (40%) in patients who presented for GBP. Yet, many of these patients with significant SAS (38%) were previously undiagnosed, despite exhibiting clear symptoms of the disease. Symptom screening appears to be effective in identifying patients who should be evaluated by polysomnography. In order to avoid the potential perils of undiagnosed SAS during the perioperative period, patients who undergo GBP should be screened, tested, and treated for this comorbidity.

## P-33.

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### **COMPARISON OF CIRCULAR-STAPLE AND HAND-SEWN GASTROJEJUNOSTOMY (G-J) IN LRYGBP**

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Sawwaf, MD; Bashir A. Zikria, MD; *Surgery, Columbia University at Harlem Hospital, New York, NY, USA*

**Background:** Review of literature shows a significant wound infection rate at trocar site with circular-stapled (EEA)G-J anastomosis of near 30% with rarer complications of hypopharyngeal perforation and esophageal mucosal injuries by oral introduction of the anvil. We compared the complication rate of EEA gastrojejunostomy with hand-sewn (H-S) anastomoses.

**Methods:** This retrospective study of Bari-Base data was performed in a teaching city hospital covering the period of 2002-2008. A total of 413 patients undergoing laproscopic gastric bypass procedures were studied. We compared the demographics and complication rates between the two groups.

**Results:** The demographics and BMI of 311 EEA Group and 102 H-S Group were comparable as well as the female to male ratio of 10/1. The following complications were found in the two groups: 1)Anastomotic Leak 1 for EEA and 0 for H-S, 2)Bleeding 19 for EEA and 3 for H-S, 3)Gastric pouch retention 2 for EEA and 3 for H-S,4)Stricture/stenosis 22 for EEA and 1 for H-S, 5)trocar site infection 16 for EEA and 12 for H-S, 6)Marginal ulcer 8 EEA and 0 for H-S, 7)Re-operation 1 for EEA and 1 for H-S, 8)Operative Time 234 +/- 25 Min. for EEA and 214 +/- 30 for H-S, 9)Hospital LOS for EEA 4.7 days and 2.5 days for H-S, 10) hypopharyngeal perforations was 0 for each group, 11)Esophageal mucosal injury was 0 for each group 12)Mortality was 0 for each group.

**Conclusion:** Our analysis of the data supports the conclusion that hand-sewn gastrojejunal anastomosis is safer, less taxing for patients and likely more cost-effective.

#### P-34.

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### SURVEY OF POST-BARIATRIC SURGERY PATIENTS: CHARACTERISTICS ASSOCIATED WITH FOLLOW-UP PRACTICES

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**Background:** This study examined the relationship between demographic characteristics, weight status, co-morbidities with follow-up practices of adults who underwent bariatric surgery at a regional hospital in Newark, DE.

**Methods:** This was a retrospective, secondary analysis of data from a cross-sectional survey of 331 adult patients (medium effect size=0.5, alpha=0.05 and power=0.95) who underwent bariatric surgery between October 2001 and June 2006. The survey included questions on demographic characteristics, weight status, prevalence and severity of co-morbidities and follow-up practices. Descriptive and inferential statistics were performed using SPSSv16.0.

**Results:** Three hundred thirty-one of 1,252 patients returned the survey (24.5%). The mean age of respondents was  $47.9 \pm 9.4$  years; 85.8% (n = 284) were female. Those that followed-up with the Registered Dietitian (RD) reported improvement of dyslipidemia ( $\chi^2 = 6.821$ ,  $p = 0.009$ ) and were younger ( $t = 2.577$ ,  $p = 0.011$ ). The less weight respondents lost, the greater their desire for follow-up ( $t = 2.345$ ,  $p = 0.020$ ). Weight loss was greater in those that attended support groups ( $t = 2.088$ ,  $p = 0.038$ ) than those who did not. More women than men lacked health insurance for follow-up ( $p = 0.009$ ) and more men than women declined follow-up ( $\chi^2 = 9.070$ ,  $p = 0.003$ ).

**Conclusion:** The results suggest that a relationship exists between follow-up practices of bariatric surgery patients and age, gender, amount of weight lost, RD and support group attendance and access to health insurance coverage. Additional research is needed to further evaluate these characteristics of post-bariatric surgery patients using a larger sample.

## P-35.

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### **GASTRIC BYPASS SURGERY PATIENTS ACHIEVING SUBOPTIMAL WEIGHT LOSS REPORT LESS VIGOROUS AND TOTAL PHYSICAL ACTIVITY**

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**Background:** Excess weight loss (EWL) 1-year after Roux-en-Y gastric bypass surgery (GBS) has been reported in the range of 60-70%. While GBS has shown to be effective, a percentage of patients undergoing GBS achieve suboptimal weight loss. The purpose of this study was to evaluate self-report physical activity (PA) participation in a group of patients achieving suboptimal weight loss (SWL) as compared to a matched group of patients achieving typical weight loss (TWL).

**Methods:** Forty-six patients undergoing GBS from 2004-2007 were retrospectively identified as achieving SWL (<50% EWL). Propensity matching was utilized to identify patients with similar pre-operative BMI, age, gender, and time to follow-up that achieved >50% EWL. Groups completed the International Physical Activity Questionnaire (IPAQ-short) during their post-operative follow-up visit closest to 1-year. The IPAQ scoring protocol was utilized to calculate walking, moderate, vigorous, and total PA MET-min/week. Data were analyzed using independent samples t-tests.

**Results:** Percent EWL in the SWL and TWL groups was 42.8% and 64.2% ( $p < 0.0001$ ), respectively. The TWL group reported significantly greater vigorous PA ( $1240 \pm 1909$  vs.  $489 \pm 1314$  MET-min/wk;  $p = 0.0310$ ) and total PA ( $3551 \pm 3642$  vs.  $2946 \pm 3010$  MET-min/wk;  $p = 0.0335$ ) and a trend toward greater moderate PA ( $1068 \pm 1251$  vs.  $570 \pm 1304$ ;  $p < 0.065$ ). There was no significant difference in reported time spent walking ( $1243 \pm 1468$  vs.  $987 \pm 1367$  MET-min/week;  $p = 0.3890$ ).

**Conclusion:** Insufficient physical activity participation may contribute to suboptimal weight loss following GBS. Patients undergoing GBS should be encouraged to progress toward inclusion of more moderate and vigorous physical activities to improve weight loss outcomes.

**P-36.**

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**CLINICAL OUTCOMES OF CIRCULAR STAPLE LINE REINFORCEMENT IN GASTRIC BYPASS SURGERY**

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**Background:** Staple line reinforcement has become more common in bariatric surgery. Its effect on anastomotic bleeding and strictures is unknown. Circular staple line reinforcement (CSLR) may provide the benefit of decreasing anastomotic stricture (AS) and anastomotic bleeding (AB). Therefore, we analyzed our data of the effect of CSLR on AS and AB in Roux-en-Y gastric bypass (RNYGB) patients.

**Methods:** We analyzed our bariatric database from 1/2004 to 7/2008. Retrospectively reviewing a single surgeon's data for circular stapled RNYGB, we matched patients for age, preoperative BMI and comorbidities. Group 1 contained patients without CSLR from 1/2004 to 3/2006. Group 2 was comprised of patients who underwent RNYGB with CSLR from 3/2007 to 7/2008.

**Results:** Please see table below.

**Conclusion:** Our data shows a trend toward decrease in AS, of up to 30%, and AB using CSLR for the gastrojejunostomy in RNYGB. Based on this information there is rationale for routine use of CSLR during RNYGB. Furthermore, the added cost of CSLR can be offset by savings from the avoided complications.

	Number of patients	Anastomotic Strictures	Anastomotic Bleeds
Group 1	168	14 (8.3%)	3 (1.8%)
Group 2	150	10 (6.7%)	0 (0%)

**P-37.**

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**REASONS FOR TACHYCARDIA IN THE POSTOPERATIVE PERIOD OF PATIENTS UNDERGOING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS**

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**Background:** Tachycardia after laparoscopic Roux-en-Y gastric bypass (LRYGB) could be a sign of a serious complication requiring prompt intervention. The aim of this study was to identify the most common etiologies for tachycardia after LRYGB.

**Methods:** The medical records of 153 patients who underwent primary LRYGB for Morbid Obesity (MO) between April and October 2006 were retrospectively reviewed. All patients were

admitted to the intermediate care unit as part of our routine protocol. Among other vital signs, heart rate was monitored postoperatively. Tachycardia was defined as a heart rate greater than 100 beats per minute (bpm). Fever was defined as temperature greater than 101.0 F°.

**Results:** 102 patients (66.6%) experienced tachycardia after LRYGB. The mean age was 43.4 years (range 18 to 70) and the Male: Female ratio was 1:4. Inpatient vital sign records demonstrated tachycardia of 100 -120 bpm (94.1%) and >120 bpm (5.9%). No specific cause was identified in 43 (42.2%) patients. Various variables were documented during the tachycardic episodes: pain (25.5%), hypoxia (9.8%), reactive tachycardia (8.8%), cardiac co-morbidity (4.9%), atelectasis (3.9%), bleeding (3.9%), and fever (0.98%). Four patients had postoperative bleeding, 3 were re-operated and one was managed conservatively. Of 9 patients with reactive tachycardia secondary to hypertensive medication, hydralazine was the most common drug (5.9%) followed by nitropaste (2.9%). Six patients had significant tachycardia >120 bpm: 3 with cardiac dysrhythmia, 2 with significant postoperative bleeding and one had hypoxia; there were no leaks.

**Conclusion:** Tachycardia is a common abnormal vital sign after RYGB. The most common identifiable cause of tachycardia in this study was pain. Bleeding was the most common reason for tachycardia requiring surgical reintervention.

## P-38.

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### **EFFECT OF A SINGLE PREOPERATIVE DOSE OF GABAPENTIN ON PONV IN PATIENTS AFTER LAPAROSCOPIC GASTRIC BYPASS**

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**Background:** Postoperative nausea and vomiting (PONV) is the most common adverse event requiring extended hospital stay in patients undergoing laparoscopic gastric bypass (LGB). This study was performed to examine the effect of gabapentin on PONV in patients undergoing LGB for morbid obesity.

**Methods:** A prospective, non-randomized pilot study was undertaken. Patients received the institutional standard of anesthetic and surgical care (NO GABA, n=13), or the standard of care plus one preoperative dose of 1200 mg gabapentin (GABA, n=12). Patients were evaluated in the post anesthesia care unit (PACU), and 12, 24, and 48 hours postop.

**Results:** The groups were similar in all recorded demographics. Intraoperative fentanyl and desflurane dose, were similar between the groups (P=0.47 and P=0.48, respectively). There was no significant difference in dilaudid usage per period, although there was a trend toward decreased usage (P=0.06) in the GABA group during the PACU stay. The prevalence of PONV and the total antiemetic use was significantly reduced in PACU in GABA versus NO GABA (P=0.04 and 0.02, respectively). There was a trend toward a decreased prevalence of PONV in the 24-hour period in GABA, but no statistical significance was observed (P=0.11)

**Conclusion:** In this nonrandomized pilot study, a decreased incidence of PONV in the PACU and a trend toward an antiemetic benefit in the 24-hour postoperative period were observed in patients receiving gabapentin prior to LGB. These observations are consistent with the

pharmacokinetics (elimination half-life of 5-7 hours) of gabapentin with an expected early benefit that is not lasting. Gabapentin may have direct antiemetic properties and may be beneficial in PONV prophylaxis. A randomized controlled trial would be useful to further explore these findings.

#### **P-39.**

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### **OUTCOMES FOLLOWING EARLY RE-OPERATION IN LAPAROSCOPIC GASTRIC BYPASS: A CASE SERIES**

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**Background:** : In the recent literature, early complications in laparoscopic Roux-en-Y gastric bypass have been managed with a combination of non-operative treatment versus surgery. We present our outcomes following early reoperations for various complications following laparoscopic gastric bypass

**Methods:** A retrospective chart review was conducted on all the patients undergoing laparoscopic Roux-en-Y gastric bypass over a 2-year period at a single institution. Demographic data was obtained on all the cases that were returned to the operating room during the initial admission for various complications.

**Results:** The complication rate was 3.8% in total of 5 patients that included one case each of peritonitis without an obvious source, an incarcerated ventral hernia, venous congestion of the roux limb, leak from the gastrojejunal anastomosis, and leak from the enterotomy on the roux limb. The average patient age is 45.6 years and the average BMI is 49.9. . Various surgical procedures that were performed included ventral hernia repair with lysis of adhesions (1), upper endoscopy (3), feeding gastrostomy (2), revision of gastrojejunal anastomosis (1), repair of enterotomy (1), and decompression of roux limb of jejunum with mesenteric release (1). Two patients were returned to operating room on the first post operative day and two on second day and one on 7th postoperative day. All the reoperations were completed through laparoscopic approach.. Average length of stay was 4.25 days with range of 3 days to 14 days. All the patients were discharged home without parenteral nutrition or drains with uneventful recovery.

**Conclusion:** Complications resulting from laparoscopic gastric bypass can be managed through laparoscopic approach and if the surgery is done promptly, morbidity can be minimized and mortality can be prevented and the length of the stay can be minimized

#### **P-40.**

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### **GI BLEEDING AFTER GASTRIC BYPASS SURGERY: NUISANCE OR CATASTROPHE?**

*Amanda M. Dick, MD; T.Karl Byrne, MD; Megan Baker, MD; Amanda R. Budak, RN, MSN, CBN; Katherine Morgan, MD; general surgery, MUSC, Charleston, SC, USA*

**Background:** Bleeding in the early post-operative period after gastric bypass surgery is a rare complication. In most cases, bleeding is self-limited. Occasionally, however, bleeding can be problematic, resulting in significant postoperative morbidity or even mortality. The purpose of this study is to review cases of early post-operative bleeding after gastric bypass in order to identify possible risk factors and examine outcomes.

**Methods:** A prospective weight loss surgery patient database was reviewed between January 2005 and July 2008. Patients with early post-operative bleeding were identified. Demographics and comorbidities were compared. Outcomes of interest included transfusion requirement, postoperative morbidity, need for reoperation, length of hospital stay, ICU admission and 30 day mortality.

**Results:** Seven hundred seventy-six patients underwent gastric bypass during the study period. Twenty eight patients (3.6%) were identified with early post-op bleeding. Of patients with early post-op bleeding the most common presenting sign/symptom was tachycardia (46%) followed by melena (32%) and hematemesis (18%). Transfusion requirements ranged from 0-11 units with an average of 3.2 units per patient. Four patients (14%) required ICU admission and 8 patients (28.6%) required reoperation. There were 2 deaths in the early pre-op bleeding group (7.1%). Compared with non bleeding patients early post-op bleeders had a significantly longer hospital stay (4.8 vs. 3,  $p < 0.0001$ ) and higher mortality (7.1% vs 0.9%.  $p < 0.01$ ).

**Conclusion:** Post-operative bleeding is a significant complication after gastric bypass surgery. In this study, post-operative bleeding contributed to significantly longer hospital stays, and resulted in 2 mortalities. The bleeding patient after gastric bypass should raise due concern, with attention to potential attendant complications.

**P-41.**

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### **GASTRO-JEJUNOSTOMY STRICTURE RATES FOLLOWING THE USE OF THE 21MM ORVIL™ DEVICE FOR LAPAROSCOPIC ROUX-EN Y GASTRIC BYPASS**

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**Background:** When a circular stapler is used, strictures of the gastro-jejunostomy (GJ) anastomosis after laparoscopic Roux-en-Y gastric bypass (LRYGB) remain the most common complication. This study evaluates the rate of strictures with the use of a 25mm vs. the 21mm OrVil™ devices.

**Methods:** All patients who underwent a LRYGB from May 2006 to September 2008 at a newly formed high volume bariatric surgery program were retrospectively reviewed. Data was collected prospectively and reviewed retrospectively. Patient demographics and peri-operative outcomes were recorded.

**Results:** Five hundred sixty five consecutive laparoscopic gastric bypasses were reviewed. Three separate techniques were used: 1) trans-gastric 25mm PPCEEA™ (n=245) 2) 25mm OrVil™ Device and DST Series™ EEA™ (n=157) or 3) 21mm OrVil™ Device and DST Series™ EEA™ (n=163). Patient sub-sets were similar in age, BMI and over-all co-morbidities. There was one leak at the GJ. Overall re-operative rate was 0.6% with no re-operations related to the GJ. No patients required a blood transfusion secondary to the GJ. Stricture rates were

significantly lower using the 25mm OrVil™ device (4/157, 2.5%) compared to the trans-gastric 25mm (29/245, 11.7% ( $p < 0.003$ )). Stricture rates using the 21mm OrVil™ Device (12/163, 7.4%) were similar to that of the 25mm OrVil™ device ( $p = 0.74$ ) the 25mm transgastric approach ( $p = 0.179$ ).

**Conclusion:** The 25mm OrVil™ device is associated with the lowest stricture rate amongst the most commonly accepted techniques for creating the GJ. The 21mm OrVil™ Device does not significantly increase the risk of GJ strictures.

#### P-42.

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### **REASONS AND OUTCOMES OF LAPAROSCOPY AS A DIAGNOSTIC AND TREATMENT MODALITY IN PATIENTS WITH CHRONIC ABDOMINAL PAIN AFTER GASTRIC BYPASS FOR MORBID OBESITY**

*Sheetal Patel, MD; Jeremy Gallego Eckstein, MD; Emeka Acholonu, MD; Wasef Abu-Jaish, MD; Samuel Szomstein, MD; Raul Rosenthal, MD; Research, Cleveland Clinic Florida, Weston, FL, USA*

**Background:** Chronic abdominal pain (CAP) or abdominal pain of unknown origin (APUO), in patients who have undergone a primary laparoscopic roux-en-y gastric bypass (LRYGB) procedure, poses a diagnostic and therapeutic challenge. We present reasons and outcomes of patients who have undergone a diagnostic laparoscopy for symptoms of CAP or APUO.

**Methods:** A retrospective review of a prospectively maintained database was used to identify patients who underwent diagnostic laparoscopy for symptoms of pain between November 2003 and October 2008 after IRB approval.

**Results:** Of 2227 LRYGB that were performed at our institution, 72 patients (3.2%) underwent diagnostic laparoscopy for CAP. 21 patients (0.9%) had internal hernias of which two underwent laparoscopic bowel resections. One patient required reconstruction of a new jejunojejunostomy. 24 patients (1.1%) were ruled out for internal hernia and had subsequent closure of potential defects. 21 patients (0.9%) underwent lysis of adhesions three patients (0.1%) had a diagnostic laparoscopy without further intervention. Two patients who presented with CAP were found to have intra-abdominal fluid collections. Once these were drained the patients experienced a resolution of their symptoms. One patient had a fistulous tract to the umbilicus that was resected laparoscopically.

**Conclusion:** CAP in patients after RYGBP appears to be caused mainly by adhesions and internal hernias. A considerable percentage of patients will have no surgical findings. Laparoscopy has proven to be a safe and efficacious diagnostic and treatment modality in this patient population.

#### P-43.

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### **TITLE: FACE TO FACE CLASS OR EMAIL FOLLOW UP... WHICH IS BETTER?**

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*Medical Center, Danville, PA, USA*

**Background:** Weight regain after bariatric surgery not uncommon in a distinct subgroup of patients. Regular follow up for prevention of weight regain is supported by current literature. However, with cost of living and gas prices on the rise, less or few patients are willing or able to continue with regular follow up. This pilot study examined the effectiveness of online/email support versus face to face classes as methods for follow up.

**Methods:** A chart review of thirty-nine post Roux-en-Y gastric bypass (RYGB) patients, enrolled in a six month back on track session was conducted. Twenty one of these patients were enrolled in an email version and 18 patients were enrolled in classes. In both groups, topics covered included: healthy behaviors, lifestyle changes, dealing with self image issues, exercise and success. Patients are expected to set up 1 very specific goal per session; goals are discussed with the group (either by email or in class setting). Achievement of goals, weight loss and weight gains are also discussed with the groups.

**Results:** The email group (average age 33, average initial BMI 31, average weight loss over a six month period 22 pounds, average final BMI 29, no members of the email group had a net gain. The class group had an average age 41, average initial BMI 37, average weight loss over the six month period was 29 pounds (with a range of - 37 to + 10) , average final BMI 34. Three patients of the class group had gained weight throughout the program.

**Conclusion:** Although differences in both groups can be noted. The importance of follow up remains paramount for prevention and treatment for weight regain. These results suggest email follow up may prove to be a beneficial and effective mode of delivery.

**P-44.**

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## **SMOKING! A MAJOR PREVENTABLE CAUSE OF GASTRO-GASTRIC FISTULA AFTER DIVIDED ROUX-EN-Y GASTRIC BYPASS SURGERY FOR MORBID OBESITY**

*Emeka Acholonu, MD; Jeremy Gallego Eckstein, MD; Sheetal Patel, MD; Wasef Abu-Jaish, MD; Samuel Szomstein, MD; Raul Rosenthal, MD; Cleveland Clinic Florida, Weston, FL, USA*

**Background:** Smoking is a well recognized factor in delayed wound healing in all aspects of medical practice. It has also been expounded as a prominent cause of marginal ulcer after RYGBP. We aim evaluate the effect of smoking as relates to the formation of GGF after Roux-en-Y Gastric Bypass RYGBP).

**Methods:** After IRB approval and following HIPPA regulations, we retrospectively analyzed our prospectively collected database for all patients that underwent divided RYGBP between February 2003 and September 2008. After adequately analyzing our data we had a total of 1722 RYGBP cases and a total of 50 GGF cases.

**Results:** There were 1284 females (75%) and 438males (25%). The age range was between 16 and 73 (average 46), the total number of smokers were 147 (8.5%), former smokers 477(27.7%) and nonsmokers 1098(63.7%). Number actively drinking (take alcohol within every 2 weeks) 639 (37%), and avoid or rarely take alcohol 1083 (63%). None admitted to abusing alcohol or taking alcohol every 72 hours. Number positive for H. Pylori was 282(16%), negative was

1440(84%). We removed NSAID from our list because most of our patients either said they took NSAIDS or “might have been taking some” prior to surgery and stayed on Lortab (acetaminophen/hydrocodone) or acetaminophen alone after the surgery. Four patients admitted to illicit drug use. Patients with other predisposing factors like trauma, malignancy or radiation were excluded from the study. The GGF cases comprised 43 females (86%). and 7males (14%). Average age was 45. 22 (44%) were smokers, 5 (10%) were former smokers and 23 (46%) non smokers. Among the GGF cases we had 4 staple line leaks and 3 of them were smokers.  
**Conclusion:** Cigarette smoking seems to be a major predisposing factor in GGF formation. It probably also increases the risk for staple line leakage after RG.

#### **P-45.**

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### **WEIGHT LOSS IN MORBIDLY OBESE PATIENTS AFTER ENDOSCOPIC DILATATION OF A GASTRO-JEJUNAL ANASTOMOTIC STRICTURE AFTER GASTRIC BYPASS FOR MORBID OBESITY**

Heather Dean, MHSc; *Jeremy Gallego Eckstein, MD*; Emeka Acholonu, MD; Wasef Abu-Jaish, MD; Sheetal Patel, MD; Andrew Ukleja, MD; Samuel Szomstein, MD; Raul Rosenthal, MD; *Research, Cleveland Clinic Florida, Weston, FL, USA*

**Background:** Anastomotic stricture (AS) of the gastro-jejunostomy (GJ) is a relatively common postoperative complication after Laparoscopic Roux-en-Y Gastric Bypass (LRYGB). The incidence is reported in the literature to be as high as 27%. The diameter of the anastomosis might play a role in providing restriction and adequate weight loss. The aim of this study was evaluate the weight loss and incidence of dumping syndrome of those patients that required endoscopic dilatations (ED) due to AS

**Methods:** After IRB approval and following HIPAA guidelines a retrospective review of a prospectively collected database was conducted on all patients that underwent LRYGB, developed GJ anastomotic stricture and required ED. Weight loss, weight regain and severe symptoms of dumping syndrome were recorded.

**Results:** Between 2001 and 2003 we performed 1001 of LRYGB. Twenty patients that developed AS at the level of the GJ were evaluated. The AS rate was 6%. The average number of ED for each patient was as follows a single dilatation in 28%, two dilatations in 33%, three dilatation in 11.5% and five dilatation in 1.5%. The average Excess Weight (EW) in this patient population was 173 (116-237). The Excess Weight Loss (EWL) achieved by this population at six months was 55.0% and 68.1% a year after surgery. Compared to 59% and 73% respectively in the rest of the LRYGB population. There were no cases of severe dumping syndrome recorded.

**Conclusion:** Endoscopic dilatation for GJAS, is a safe treatment modality. From this series it appears that dilating the GJ for AS does not result in failure of predicted weight loss or symptoms of dumping syndrome.

#### **P-46.**

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## **INCREASED PATIENT-SAFETY BY IMPLEMENTATION OF STRUCTURED COMMUNICATION IN BARIATRIC PROCEDURES**

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**Background:** Surgical success depends on technical and non-technical factors. The importance of intra-operative communication (a non-technical factor) for patient-safety has recently been demonstrated by the ACS claims study and the WHO project Safer surgery saves lives.

**Methods:** A concept of structured communication consisting of pre- and intra-operative briefing and post-operative debriefing was implemented for bariatric operations in our institution. The aim was to give all participating persons the same level of information before surgery, demonstrate intra-operative risks and decisions, and discuss problems and underlying causes after surgery. The surgical process was monitored and evaluated by external investigators before (three operations) and after (three operations) implementation of briefings with the Line orientated safety audit (LOSA) focussing on the items of evaluation of plans, assertiveness, leadership, and communication environment.

**Results:** Briefing was performed during 29 operations (predominantly laparoscopic gastric bypass). During these operations five unexpected events occurred (stapler dysfunction, loss of a needle, Ligasure not available, inadequate experience of nurse in training, missing patient's approval form to operation). All problems were solved without adverse effects for patients, post-operative debriefing identified systemic factors as root causes in four cases. Operative procedures were changed according to debriefing results. The external evaluation by LOSA demonstrated an improvement of the overall score from 2.8. to 3.1. Team relevant behavior could be increased from 30 to 73 percent.

**Conclusion:** Patient safety was increased by the implementation of structured communication during bariatric operations.

**P-47.**

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## **BODY COMPOSITION (BC) IN THE SUPER OBESE (BMI>50) COMPARED TO THE MORBIDLY OBESE (BMI <50) IN RESPONSE TO WEIGHT LOSS SURGERY?**

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**Background:** Previous observations indicate there are differences in weight loss related to the surgical option elected. The purpose of this study was to define possible differences in regard to the correlation of excess weight loss (EWL), BMI change and % body fat loss between those with BMIs >50 [SO] and those with BMIs <50 [MO].

**Methods:** All patients requesting weight loss surgery were asked to sign an informed consent approved by our Institutional Review Board and had BC measured using bioimpedance (Tanita 310). Patients were divided by BMI, those with SO and those with MO. For comparisons t-tests

were used and Pearson's correlations were determined for BMI, EWL and % body fat change.

**Results:** There were 133 patients identified as MO (BMI  $43.3 \pm 3.6$ ), and 88 were SO ( $59.4 \pm 10.8$ ). The % body fat (BF) was  $46.7 \pm 5.7$  and  $51.9 \pm 6.9$  ( $p < .0001$ ). Follow-up after surgery was equivalent, 21.5 and 20.6 months, ( $p=0.62$ ). The two groups were not different in regard to age,  $43.4 \pm 11.0$  and  $42.5 \pm 10.1$ , but were different in regard to gender distribution 76.7% women (F), 23.3% men (M) MO, compared to SO, 58% F and 42% M ( $p= 0.003$ ). After surgery MOs had a BMI of  $30.9 \pm 5.7$  and SOs had a BMI  $37.3 \pm 9.0$ , however BF was not significantly different, MO  $33.1 \pm 9.6$  and SO  $35.0 \pm 12.4$  ( $P= 0.21$ ). While F and M were different in regard to BF pre surgery, these differences persisted after surgery for the F ( $P < 0.0001$ ) but the M were not different 24.8% and 26.6% ( $p= 0.51$ ). The change in BMI and the change in BF had a stronger correlation for MO,  $r= .833$  versus SO,  $r = .526$ . The EWL for the MO was  $65.1 \pm 28.1\%$  versus SO  $63.4 \pm 18.8\%$ , ( $P= 0.64$ ).

**Conclusion:** The SO achieved EWL similar to the MO. At a BMI of 37.3, the BF was not different from the MO who had a BMI of 30.9 indicating altered lean body mass retention.

#### P-48.

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### RELATIVE PREVALENCE OF PROTEIN ENERGY MALNUTRITION AFTER ROUX-EN-Y BYPASS AND BILIO-PANCREATIC DIVERSION IN MORBIDLY OBESE PATIENTS

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**Background:** Massive weight loss after bariatric surgery corresponds to a situation of low food intake and some degree of malabsorption. The latter is significant with bilio-pancreatic diversion with duodenal switch (BPD-DS) but may be less prevalent after Roux-en-Y bypass (RYGB).

**Methods:** We retrospectively assessed the changes in serum albumin concentration in 74 patients (age 42, initial BMI 48.5) after a BPD-DS (gastric sleeve volume 150-200 ml, alimentary limb 150 cm and common channel 100 cm), and in 116 patients (age 42, initial BMI 47.9) after RYGB (gastric pouch 30-50 ml; sum of the bilio-pancreatic and Roux limbs 216 cm). Each procedure was performed by a dedicated surgeon. Patients were assessed at month 3, 6, 12 and 24.

**Results:** Weight changes were significantly more important after BPD-DS (mean excess weight loss at 2 yrs  $78.2 \pm 21.2\%$ ) than after RYGB ( $64.6 \pm 27.0\%$ ). There was only one patient displaying an albumin concentration lower than 30 g/L in the RYGB, and 5 such patients in the BPD-DS group. Among these 5 subjects, 2 had an enterocutaneous fistula, 2 had a very low protein intake. Changes in albumin concentration were not related to the magnitude of weight loss.

**Conclusion:** In conclusion, despite an important weight loss, protein malnutrition is not very prevalent after bariatric surgery, more often so however after BPD-DS. Considering the low protein intake, these data suggest that there may be some adaptation of protein metabolism after bariatric surgery.

#### P-49.

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## CARDIO-VASCULAR RISK REDUCTION AFTER GBP FOR TYPE 2 DM IN PATIENTS WITH BMI < 35KG/M2

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**Background:** Metabolic syndrome (MS) is known to increase coronary heart disease (CHD) risk in diabetics. Improvement in MS and glycemic control can reduce this risk. United Kingdom Prospective Diabetes Study( UKPDS) risk engine predicts the absolute risk of CHD in this population. This study aims to evaluate absolute CHD risk in Type 2 Diabetic patients with Body mass index between 22 and 34.99Kg/M2 before and after gastric bypass.

**Methods:** Sixteen Type 2 diabetic patients with BMI less than 35Kg/M2 and C-Peptide more than 1ng/ml were prospectively evaluated using UKPDS risk engine preoperatively & at 9 months after GBP.For analysis paired T test was used.

**Results:** The mean age and HbA1C was 44±22yrs and 11 ± 3.5 % respectively .The calculated mean Pre and Post-operative CHD risk and the Pre and Post-operative fatal CHD risk was 15.58 and 5.033 and 10.553 and 2.687 respectively. Pre & Post-operative stroke risk and Pre & Post-operative fatal stroke risk was 4 and 2.687 and 0.633 and 0.3 respectively. Statistically significant difference was found between pre and post operative CHD & fatal CHD risk.

**Conclusion:** GBP does reduce the risk of CHD in type 2 diabetic patients with BMI < 35Kg/M2. Further studies with a larger sample & long term results are needed.

P-50.

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## PREDICTORS OF BARIATRIC SURGERY AMONG AN INTERESTED POPULATION

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**Background:** Morbidly obese patients considering bariatric surgery face a difficult decision given the tradeoff between the benefits and risks of surgery. Our goal was to study the forces driving the decision to have bariatric surgery and improve our understanding of the decision making process.

**Methods:** We developed a 64 item survey to assess factors in the decision making process for bariatric surgery. We recruited subjects from a bariatric surgery ‘interest group meeting’ associated with a large, multidisciplinary, university-based bariatric practice. We administered the survey at the conclusion of the interest group which is the first step for those interested in bariatric surgery. We contacted subjects at 1 year to see if they had surgery or were still planning to have surgery. We developed logistic regression models to predict who pursued or still planned to pursue surgery.

**Results:** We recruited 200 subjects over an 8-month period. Mean age was 45 years; mean BMI was 48 kg/m2, and 75% were female. 95% of subjects had at least one obesity-associated

condition, and 60% of subjects had at least 3. At one year, 35 subjects had surgery and 31 still planned to have surgery. There was no association between age, gender, or obesity-associated conditions and surgery or plan to have surgery. Subjects having surgery or still planning to have surgery had significantly lower scores for quality of life and decisional conflict (indicating readiness to make a decision), and significantly higher self-efficacy scores (indicating self-confidence in decision making).

**Conclusion:** The decision to have bariatric surgery is driven mainly by lower quality of life and also is influenced by process measures of decision making. Factors clinicians might consider important, such as gender, age, and the presence of obesity-associated conditions did not influence the decision.

## P-51.

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### **ATTRITION FROM A SURGICAL WEIGHT LOSS PROGRAM**

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**Background:** Attrition from medical weight loss programs is well studied, and reported reasons for attrition vary. Little is known, however, about attrition from surgical weight loss programs (SWLPs). Our goal was to identify reasons for attrition, in order to improve care and better allocate resources.

**Methods:** We included all patients entering our SWLP during a recent ten-month period. Charts of 335 non-completers were reviewed, and reasons categorized. If no reason was identified, questionnaires were mailed.

**Results:** Our demographics were similar to other SWLPs. 613 patients entered from July 1, 2007 through April 30, 2008. 45.4% (n=278) underwent or were scheduled for surgery. Of the remaining 54.6% (n=335) who had not yet completed the program, 20.1% (n=123) dropped out for no identifiable reason. This included patients who were found to have relocated. 17.8% (n=109) were released from the program for medical, psychological or compliance risk issues. 4.7% (n=29) had insurance or financial reasons for not continuing, 2.3% (n=14) changed their mind about surgery, and 0.3% (n=2) lost sufficient weight to no longer qualify. 9.5% (n=58) were still successfully in progress at the time of the survey.

**Conclusion:** For medical weight management programs, attrition is a health concern and an access-to-care issue for the obese. A special consideration for SWLPs is the use of resources by patients who will not achieve surgical benefit. In our study, approximately equal numbers dropped out as were asked not to continue. Both de-selection and attrition must be taken into account in SWLPs, and better screening tools for program entry are needed to predict successful candidates and outcomes.

## P-52.

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# TORSO VOLUME - TORSO SURFACE AREA RATIO VS. BMI AND WAIST HIP RATIO - RESULTS OF A RANDOMIZED AND RETROSPECTIVE STUDY OF 500 BARIATRIC PATIENTS

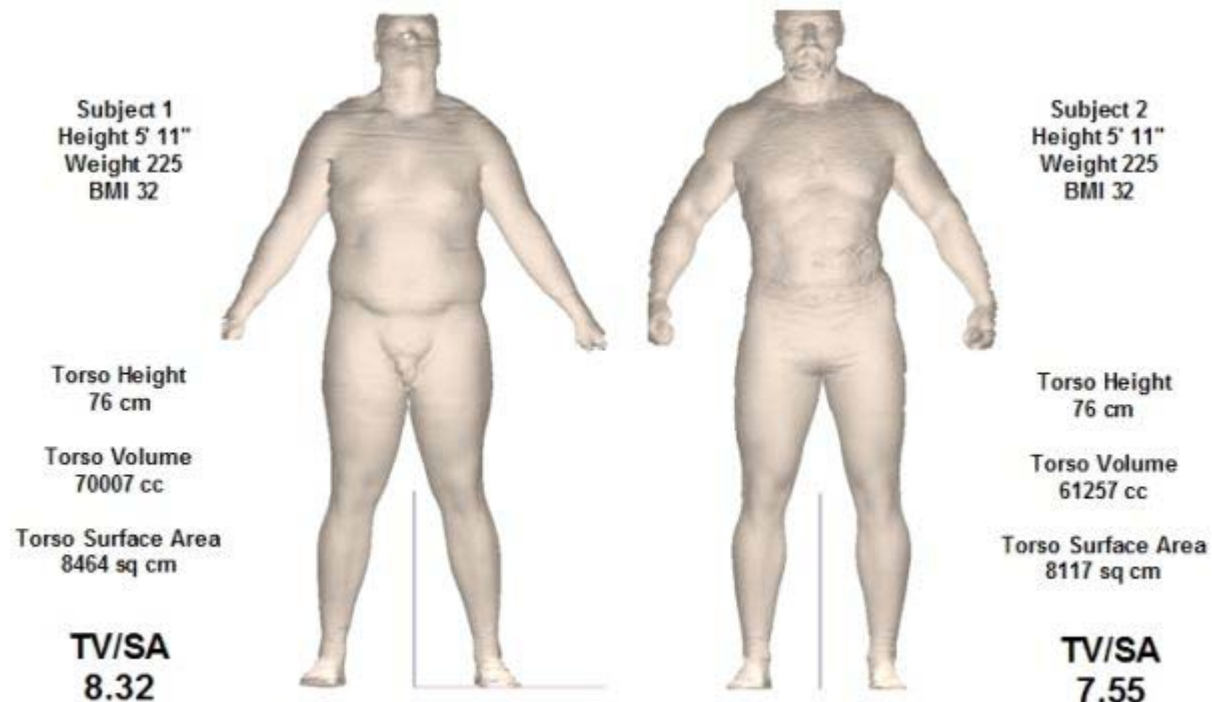
*Stephen Wohlgemuth, MD; Metabolic and Weight Loss Surgery Center, Sentara Hospital System, Norfolk, VA, USA*

**Background:** Body Mass Index is not an optimal indicator of obesity, nor does it accurately indicate the degree of obesity between obese individuals. Individuals may have the same BMI, but have vastly different shapes, height or weight. A better indicator of obesity is to determine the amount of relative space the individual occupies. A ratio has been developed using a subject's torso volume divided by their torso surface area (TVSA ratio). This ratio eliminates reliance on weight or height of the patient and appears to be a more accurate and flexible obesity descriptor than BMI.

**Methods:** 500 bariatric patients were scanned using a commercial 3D scanning device. Common measurements were extracted and recorded, included waist and hip. Torso volume and torso surface area were calculated, and each BMI was determined. A statistical analysis was created that compared waist-to-hip ratios to BMI, and TVSA. A separate analysis was created that compared groups of individuals with similar BMI to TVSA.

**Results:** The TVSA, or the relative space an individual occupies clearly differentiated the degree of obesity between groups of individuals having similar BMI, and normalized the distortions inherent with BMI due to its reliance on patient-specific height and weight.

**Conclusion:** Evaluating obesity on the TVSA scale instead of BMI promises to offer a more objective obesity indication.



Comparison of Body Shapes Having Same Height, Weight and BMI

Subjects with same BMI have different torso volume and surface area



Measuring the bariatric patient and determining torso height, torso volume and torso surface area

P-53.

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## A UNIQUE BARIATRIC SURGERY NETWORK UTILIZING TELEMEDICINE PROVIDES SAFE ACCESS TO REMOTE PATIENTS

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**Background:** A unique bariatric surgery network was developed for remote patients using principles of risk reduction for complex procedures i.e. experienced surgeons and team approach. Centralizing expertise, education of satellite centers, standardizing protocols, telemedicine and electronic medical records were key.

**Methods:** After selecting and funding a central site, a multi-institutional panel standardized management protocols prior to program initiation. These protocols were propagated by instructors from the central site to 7 participating regional Veterans Affairs Medical Centers (VAMC). Patient evaluation was completed at the satellite and accessed centrally via computerized medical records. Surgical consultation and patient education were conducted via telemedicine from the central site. High volume consulting bariatric surgeons performed surgery at the core VAMC, discharged patients to a hotel, returning them to the satellites for care after the first postoperative visit and helped resolve long term bariatric issues. Patient characteristics and outcomes were recorded prospectively.

**Results:** Patients (n=28) were high risk (male, older and mean BMI > 44 with 82% having 2 or more major co-morbidities). Patients travelled an average of 324.5 miles, 82% utilized telemedicine, mean operative time was 183 +/- 43.74 minutes and laparoscopic completion rate was 96.4%. Mean hospitalization was 4 +/- 3.47 days. There were no mortalities. Four patients had early major complications (bleeding, negative laparoscopy and DVT).

**Conclusion:** Our cooperative model adhered to principles of risk reduction for complex surgery

yet made it feasible for high risk remote patients to access bariatric surgery and conserve resources. We suggest wider use of our model to increase access to other skill and resource intense procedures in sparsely populated areas.

#### P-54.

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### **INCIDENCE OF HELICOBACTER PYLORI IN MORBIDLY OBESE PATIENTS HAVING BARIATRIC SURGERY. IS IT IMPORTANT?**

*Carlos Barba, MD; Jason M. Reese, PA-C, MHS, MIH; Melissa Sullivan; Surgery, Hospital of Central CT, Hartford, CT, USA*

**Background:** The incidence of helicobacter pylori (HP) in patients having bariatric surgery has been reported to be as high as 60%. There is controversy regarding the significance of HP presence regarding postoperative complications

**Methods:** Prospective review of all patients preparing for bariatric surgery during 18 months. Pre-operative endoscopy was performed and CLO test done in all patients not treated with proton pump inhibitors. Clo test was reported in 24 hours with a positive or negative report. Demographics, comorbidities, type of surgery and complications were also recorded.

**Results:** A total of 331 patients were included. Mean age 40.7 and BMI of 49.9. Eighty percent of patients were female. Fifty-four percent had gastric bypass and the rest adjustable gastric band. Incidence of HP was 17%. More than 80% had at least 1 obesity related comorbidity. No difference in ulcerations, reflux disease, anastomotic strictures was found between patients with or without HP. No difference was found when groups analyzed by comorbidities or BMI.

**Conclusion:** Incidence on HP in morbidly obese patients preparing for bariatric surgery is lower than reported. HP does not seem to correlate with any complication post surgery related to the upper GI tract. We do not recommend routine testing for HP.

#### P-55.

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### **IMPACT OF PREOPERATIVE BARIATRIC EDUCATION SESSIONS ON PROSPECTIVE PATIENT KNOWLEDGE AND DECISION FOR TYPE OF SURGERY**

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**Background:** In the United States, preoperative education sessions are offered by bariatric surgeons as a method of educating prospective patients. However, there is a paucity of research on the impact of such sessions. The purpose of this study was to evaluate the effects of group education sessions on prospective patient knowledge of bariatric surgery and preference for surgical procedure.

**Methods:** Participants included forty-eight prospective bariatric patients (73% female; 87% Caucasian; mean age of 44 years) who attended a bariatric education session led by a bariatric

surgeon. Before and after the education session, participants completed a questionnaire that assessed knowledge about obesity- and bariatric surgery-related issues as well as preference for surgical procedure (band versus bypass). Knowledge items were summed to form a Total Knowledge score (possible range 0 to 26). Preference items queried whether patients desired gastric bypass, laparoscopic adjustable gastric banding, or were unsure which procedure they preferred.

**Results:** Total Knowledge scores increased significantly pre-session ( $M = 15.02$ ,  $SD = 4.26$ ) to post-session ( $M = 20.8$ ,  $SD = 3.6$ ),  $t(47) = -10.40$ ,  $p < 0.001$ ). Participants correctly answered 58% of questions correctly pre-session, improving to 81% post-session. The information session also resulted in fewer patients being “unsure” of which type of surgery they preferred (band versus bypass) with 21% unsure pre-session reducing to 8% unsure post-session, a difference that was marginally significant ( $p = .058$ ).

**Conclusion:** This study confirmed that a preoperative education session increased patient knowledge about bariatric surgery issues and assisted in patient preference for type of surgery.

**P-56.**

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### **THE STANDARDIZED WEIGHT LOSS CURVE: A USEFUL TOOL FOR PATIENT FOLLOW UP AFTER GASTRIC BYPASS**

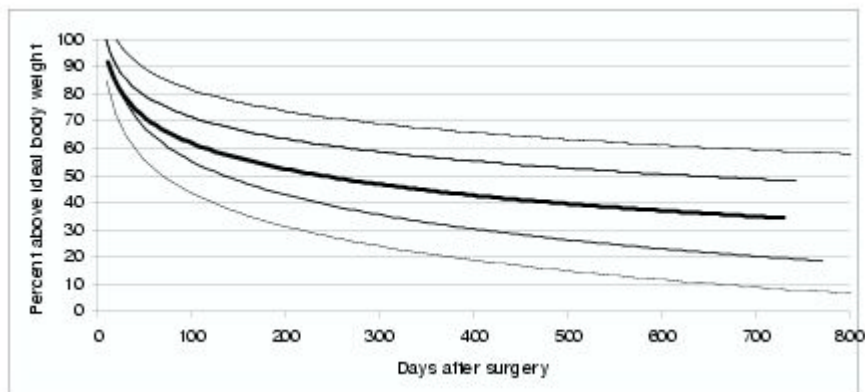
*Joseph A. Caruana, MD<sup>1</sup>; Eran Kabakov, BS, PT<sup>2</sup>; Andrew Peterson, BS/MS, RPA-C<sup>2</sup>; Marc McCabe, RPA-C<sup>1</sup>; Audrey Smith, RPA-C<sup>2</sup>; Julia Kabakov<sup>2</sup>; <sup>1</sup>Surgery, Sisters of Charity Hospital, Williamsville, NY, USA; <sup>2</sup>Synergy Bariatrics, Williamsville, NY, USA*

**Background:** The usual method of plotting patients’ weight loss (WL) every 3 months after gastric bypass (GB) produces wide variations, because weights are not usually recorded at these discrete intervals. Also curves which rise over time make it difficult for patients to visualize WL success.

**Methods:** 140 women and men having a minimum of 6 weight measurements over 2 years were selected at random. Initial body mass index (BMI) was 37 to 84. On the y axis was the % above ideal body weight (IBW) derived from the formula:  $(\text{current weight} - \text{IBW}) / (\text{initial weight} - \text{IBW})$ . On the x axis were the days after GB. Data were placed in an Excel spreadsheet and plotted using the logarithmic graph function. Each curve was overlapped to create one standard curve. The reliability of this standard curve was then tested in a subsequent group of 1800 patients.

**Results:** The curve for each patient in the initial group demonstrated a high R<sup>2</sup>. They produced a standard curve with a mean (dark line)  $\pm$  two standard deviations. Gender and BMI did not affect the curve. The reliability of the standard curve was verified by the subsequent group.

**Conclusion:** A standardized WL curve allows practitioners and patients to easily assess WL after GB. Deviation allows for prompt nutritional intervention, e.g., attention to tighter glycemic control in diabetics. The high R<sup>2</sup> of curves from individual patients suggests inherent metabolic factors affecting WL. Finally, standard curves for different WL procedures can allow for better comparison of results.



**P-57.**

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### **OUTCOMES OF INTENSE INVESTIGATION OF BARIATRIC SURGERY PATIENTS LOST TO FOLLOW UP**

Corinne Jordan, MD; Valerie Halpin, MD; William Raum, MD, PhD; *Emma Patterson*; Matthew Muhlbauer, BS; *Oregon Weight Loss Surgery, Portland, OR, USA*

**Background:** Bariatric Centers of Excellence require 75% five year follow-up. The purpose of this study was to evaluate aggressive recruitment of patients lost to follow up greater than 24 months.

**Methods:** A clinical database of 1158 patients who underwent bariatric surgery from 11/14/2000 to 5/15/2006 was retrospectively reviewed for patients lost to follow-up greater than 24 months. Patient contact was attempted by phone at numbers listed in the database, then emergency contacts, then the listed primary care physician. Finally, an internet search was performed. Three calls were attempted and messages left at a frequency that did not exceed two calls per week. If no telephone contact was made, letters were sent to existing addresses in the database or to forwarding addresses obtained in the search. Return of the letter resulted in termination of the search. If the patient refused to return for a visit during phone contact an interview was conducted.

**Results:** There were 424 (37%) patients lost to follow up greater than 24 months. Of those 424 patients, 4 were deceased from other causes. In the 420 remaining patients 74 returned for an office visit and 90 completed a phone interview. Twenty-one patients did not keep scheduled appointments. A total of 466 man hours were used at an average of 6.3 hours per office visit and 2.8 hours for total visits. Total long term follow-up was increased by 14%.

**Conclusion:** Aggressive long term follow up in bariatric surgical patients is labor intensive with modest returns.

**P-58.**

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### **EVALUATING THE WEIGHT LOSS PATIENT FOR PLASTIC SURGERY: RECOMMENDATIONS FOR SAFE PATIENT SELECTION**

*Joseph Michaels, MD; Devin Coon, BA; Nima Naghshineh, MD, MSc; Tali Friedman, MD; J. Peter Rubin, MD; Department of Surgery, Division of Plastic Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA*

**Background:** Patients that have undergone weight loss surgery often demonstrate significant improvement in their obesity-related medical problems, but they are often left with excess skin and subcutaneous tissue. These patients frequently present for postbariatric body contouring, but many remain high risk surgical candidates. Preoperative evaluation and proper patient selection are critical to safe and successful outcomes.

**Methods:** 449 patients were enrolled in an IRB-approved prospective clinical database established to analyze postbariatric body contouring outcomes. Inclusion required weight loss > 50 pounds. Measures included BMI, MaxBMI,  $\Delta$ BMI, nutritional analysis, procedures performed, and postoperative complications.

**Results:** Time from weight loss surgery was inversely correlated with continued weight loss. Poor daily protein intake was considered an indicator of negative nitrogen balance; however, it did not correlate with other indicators such as prealbumin/albumin levels. Current BMI was not a predictor of future weight loss. MaxBMI and  $\Delta$ BMI were both significantly associated with development of postoperative complications, whereas current BMI was not. Multiple procedure cases had increased complication rates. Twelve patients required reoperation (2.4%). This was not correlated to BMI indices.

**Conclusion:** Patient safety is paramount for patients undergoing elective postbariatric body contouring procedures. We identified five key factors for safe patient selection: Timing of plastic surgery relative to weight loss surgery, current BMI, nutritional analysis, evaluation for residual medical problems, and management of psychosocial issues. MaxBMI and  $\Delta$ BMI are useful predictors in assessing patient risk for postoperative complications. BMI should not be used as an absolute threshold to offer surgery, but may serve as a predictor of aesthetic outcome.

**P-59.**

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## **BARIATRIC PATIENT ADVISORY COUNCIL**

*Christine Tea, MSN; Bariatrics, Inova Fair Oaks Hospital, Fairfax, VA, USA*

**Background:** Our patients are what make our work rewarding and meaningful, and who knows better than the customer how to make a great program even better? Growing literature supports and demonstrates many advantages to having patients more involved with programmatic decision making and guiding the program.

**Methods:** Bariatric staff members selected members from a group of volunteer patients who had undergone bariatric surgery and who met certain criteria. This criteria included patients who were at least six months post-op, able to collaborate, possess good communication skills, have respect for other team members and an ability to provide constructive criticism.

**Results:** The Council has accomplished several goals including, spouse specific education including breakout sessions for spouses during support group meetings, managing online support group and book review and recommendation to add to our patient and family “Recommended Resource List.” Patient education materials are reviewed and revised routinely by the team.

Patient education videos are pre-screened by our council members. Marketing strategies are previewed and/or suggested by this council and some have been implemented.

**Conclusion:** Future goals include, a representative to attend the hospital wide Bariatric Advisory Board, development of a “Reconnect” group for patients who are two years post surgery or further and an exercise group just for postoperative patients. The public demands transparency in health care, and as health care providers we need to create opportunities to hear and respond more directly to our patients needs and ideas.

## **P-60.**

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### **INFORMATIONAL SEMINAR EVALUATIONS: A VITAL TOOL**

*Vonzie Niehoff, RN; Bariatrics, Inova Fair Oaks Hospital, Fairfax, VA, USA*

**Background:** For several years, Inova Fair Oaks Hospital (IFOH) has offered surgeon-led pre-operative bariatric seminars to anyone considering a bariatric surgery. From seminar evaluations and patient outcomes, we have ascertained that patients benefit from these sessions. We want feedback from attendees to determine their perception of how the seminar met the needs and expectations of the participant.

**Methods:** Participants are given a paper evaluation form in the seminar folder. The questions on the evaluation enable the bariatric staff to gather information regarding miles traveled to the seminar, how the participant learned about the physician and IFOH program, whether the person has attended other bariatric seminars in the past, the location of that seminar, was as well as their thoughts regarding the quality of the IFOH seminar and suggestions for changes or inclusions. These forms are then entered in to survey database for compilation.

**Results:** Information gathered from these evaluations has enabled the bariatric staff to structure the seminars based on the needs of the participants.

**Conclusion:** At this time, we continue to gather seminar evaluations, which have offered valuable information and driven changes and inclusions to the seminar presentation; changes include format of physician presentation, the nurse presentation, and handout materials. Due to the acceptance of this tool by the participants, we plan to continue the use this tool to make pre-operative seminars attractive to prospective patients.

## **P-61.**

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### **ONLINE PATIENT EDUCATION: A SUPERIOR ALTERNATIVE TO IN-PERSON INFORMATION SEMINARS**

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**Background:** In person seminars for prospective bariatric surgery patients are widely used to disseminate information about procedures offered, associated risks and benefits, and practice specifics. However, problems with this approach include message inconsistencies which can

affect participants' comprehension or malpractice exposure, and resource strains like practitioners' time, scheduling conflicts, space limitations and restricted geographical reach. We sought to evaluate patients' satisfaction with online delivery of this seminar to determine whether this method could potentially solve these problems.

**Methods:** A survey of prospective patients who participated in the online seminar of a single practice was conducted. Individuals were surveyed about their overall impressions of the seminar itself and their internet and computer habits. Questions related to time for seminar completion; its ability to inform and reassure about the decision for surgery; the quality of this learning experience, and the likelihood of choosing this learning option again.

**Results:** From September 2004 to June 2007, 3,120 surveys were collected. Data revealed this population to be web-savvy individuals with internet capabilities at home. 2886 reported completion of the seminar in an hour or less. Ninety-nine percent rated this as a first-rate learning experience and 97% would choose this method to prepare for future procedures. Finally, users indicated high satisfaction (99%) with the seminar's ability to answer general questions about the surgery and make them more comfortable about proceeding with their decision.

**Conclusion:** Although highly underutilized, online patient education is an advantageous alternative to conventional seminars; satisfying both patients' needs and practice goals.

**P-62.**

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### **ASSOCIATION OF OBESITY WITH RISK FOR CORONARY HEART DISEASE: FINDINGS FROM THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY, 1999-2006**

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**Background:** Obesity is a risk factor for development of coronary heart disease (CHD). The aim of this study was to examine the changes in the 10-year CHD risk with increasing severity of obesity from men and women participating in the latest National Health and Nutrition Examination Survey (NHANES).

**Methods:** Data from a representative sample of 39,352 US participants in the NHANES between 1999 and 2006 were reviewed. The Framingham Risk Scores (FRS) were calculated according to weight class. Overweight, obesity class 1, obesity class 2 and obesity class 3 were defined as a BMI of 25.0-29.9, 30.0-34.9, 35.0-39.9, and >40.0, respectively.

**Results:** With increasing weight class, the prevalence of individuals with abnormal systolic blood pressure (>140 mmHg) increased from 5% for normal weight group to 18% for obesity class III and abnormal cholesterol level (>200 mg/dl) increased from 15% for normal weight group to 31% for obesity class III. The 10-year CHD risk increased significantly with increasing weight class for both men and women, particularly for Mexican American men and white women.

**Conclusion:** The 10-year coronary heart disease risk, as calculated from the Framingham risk scores, substantially increases with increasing weight class. Although obese men are at higher risk for CHD than obese women, there is a disparity in the number of men accepting bariatric surgery as an appropriate surgical weight loss option. Further studies are needed to address this

issue of gender disparity in bariatric surgery.

	Normal	Overweight	Obesity Class I	Obesity Class II	Obesity Class III
No. of individuals	2,533	1,571	1362	542	337
10-year CHD risk for men (%)	1.2 ± 0.1	4.4 ± 0.2	4.8 ± 0.3	4.8 ± 0.4	3.3 ± 0.5
10-year CHD risk for women (%)	0.4 ± 0.1	1.0 ± 0.1	1.0 ± 1.0	1.3 ± 0.1	1.4 ± 0.2

**P-63.**

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**CARDIOVASCULAR COMPLICATIONS OF OBESITY SURGERY IN PATIENTS WITH INCREASED PREOPERATIVE CARDIAC RISK**

*Bosede Afolabi, MD; Gian M. Novaro, MD; Samuel Szomstein, MD; Raul Rosenthal, MD; Craig R. Asher, MD; Cleveland Clinic Florida, Weston, FL, USA*

**Background:** Weight loss surgery (WLS) has been shown to reduce the incidence of cardiovascular events by modifying associated risk factors. However, a paucity of data is available on the evaluation and outcomes of those patients with increased preoperative cardiac risk.

**Methods:** Retrospective analysis of consecutive patients undergoing WLS. Use of beta-blockers, non-invasive stress testing, and perioperative events were assessed.

**Results:** Of the 157 patients with a preoperative cardiac consultation, 154 had complete data that was analyzed; female 70% (n=108) with 16% (n=25) of patients over the age of 65 years. The total number of patients who received perioperative beta-blockers was 47% (n=72); of patients over 65 yrs of age, 56% (n=13) received beta-blockers. Non-invasive stress testing was done in 49% (n=76) of patients. A positive stress test was encountered in 24 patients undergoing non-invasive testing (31% of sample size), of these 75% were female. Only one patient with a positive stress test had an obstructive coronary lesion. There were no cardiac related hospital events in 145 patients (93%). There were 9 non-fatal cardiac related events. The in-hospital mortality was 0%.

**Conclusion:** WLS in patients with risk factors for CAD or CAD is a safe and well-tolerated procedure. There is an overall low rate of cardiac events, all of which were not serious. Non-invasive stress testing in this population has a high rate of false positive results and uncommonly leads to intervention.

**P-64.**

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## **PSYCHOLOGICAL CLASSIFICATION IN OBESE PATIENTS AS A MANAGEMENT TOOL TO OPTIMIZE SUCCESS AFTER A BARIATRIC SURGERY PROCEDURE**

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**Background:** Psychological evaluation is used to ascertain the patient's suitability for bariatric surgery and challenge their ability to comply with therapy. The paradigm of obesity in which the limbic system of appetite and reward plays at least as important a role as the neurobiological components validates inclusion of this evaluation in the clinical pathway. A psychological classification system is presented with the goal of integrating psychological factors into patient management.

**Methods:** All patients (gastric bypass, N=2253; adjustable gastric band, N=700) were evaluated with psychological testing/interview and assigned to Groups 1-4 prior to surgery. Group 1 patients (N=956) did not necessitate intervention, Group 2 (N=1349) were required to attend support group, Groups 3A (N=497) and 3B (N=146) required intervention in order to continue to surgery, Group 4 patients were not recommended for surgery. Main outcome measures such as complication rates, readmissions and reoperations were analyzed for differences between psychological groups.

**Results:** After comparing outcome measures between each classification, there were no significant differences in major complication rates, readmissions, reoperations, and length of stay between each group. Group 3A and 3B were able to achieve similar rates of success despite their psychosocial impairment at the time of the procedure.

**Conclusion:** Assignment of psychological classification facilitates bariatric team recognition of unique psychological factors that impact the success of surgery. Intervention of assessing the psychological composition of a patient and addressing potential psychosocial barriers prior to surgery can increase positive long-term outcomes and reduce complications after bariatric surgery.

**P-65.**

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## **OUTCOMES OF BARIATRIC SURGERY IN PATIENTS OVER 70 YEARS OF AGE**

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**Background:** It is estimated that 34% of the population age 60 years or older are affected by obesity disease. Eight percent of these patients are super morbidly obese. In previous reports we demonstrated the safety and efficacy of bariatric surgery in patients older than 60 years of age. The aim of this study was to report outcomes in patients older than 70 years of age.

**Methods:** This is a retrospective review of a prospectively collected database. After IRB approval and following HIPPA regulations, the charts of all patients that underwent Bariatric surgery at Cleveland Clinic Florida between January 2002 and September 2008 were retrospectively reviewed. We looked specifically at patient's age greater than 70 years, comorbid

conditions, complications and weight loss.

**Results:** Forty-two patients older than 70 underwent bariatric surgery: Lap band 22 (52.4%), Sleeve gastrectomy 12 (28.6%) and Roux-en-Y gastric bypass (RYGB) 8 (19%). Age 73.5 +/- 2 years, 52.4 % women, 47.6% men, BMI 46.8 +/- 6.7 Kg/m<sup>2</sup>, initial weight 281 +/- 41 lb. Preoperative comorbidities were: HTA 66%, hyperlipidemia 57%, diabetes mellitus 38%, joint disease 30%, sleep apnea 26%, coronary artery disease 19%, cardiac arrhythmia 19%, and cardiac failure 9.5%. All the cases were started laparoscopically and there were only two conversions to open technique (5%), 13 patients (30.9%) had one or more concomitant procedure and the length of hospital stay was 5.4 +/- 3 days. There was no mortality in this series; 11 patients (26%) had complications: 4 wound infections (9.5%), 3 bands removed (7%), 2 colotomies (4.7%) and 1 leak (2.3%). 79.5% patients were followed for 20.5 +/- 11 months, they had lost 67.1 +/- 33 kg and 49 +/- 18 %EWL.

**Conclusion:** Bariatric surgery in patients older than age 70 years old appears to be safe and effective.

**P-66.**

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**IMPLEMENTATION OF A PILOT PROGRAM UTILIZING A NURSING DRIVEN PROTOCOL FOR INTRAVENOUS INSULIN INFUSION TO ACHIEVE TIGHT GLYCEMIC CONTROL IN BARIATRIC SURGERY PATIENTS ON A GENERAL SURGICAL UNIT**

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**Background:** Medical literature supports the findings that tight glycemic control decreases morbidity and mortality in post operative patients. The bariatric surgery patient population frequently requires IV insulin infusion to maintain blood sugars in the normal range. The bariatric surgeons did not want to admit these patients to critical care for administration of an insulin infusion protocol.

**Methods:** In November 2007, we implemented a pilot on a general surgical unit in which we use a nursing driven Intravenous Insulin Infusion Protocol with an adjusted nurse patient ratio. Nurses in our post anesthesia care unit and the surgical unit were educated regarding use of the protocol and insulin safety practices.

**Results:** Baseline data was collected on 5 patients receiving insulin infusion off protocol. The pilot program was initiated with algorithms 1-5. In order to reach our glucose goals, additional algorithms (6-8) were created to accommodate the larger doses of insulin required by this patient population. See table.

**Conclusion:** Patients on the insulin infusion protocol using algorithms 1-8 achieved a higher proportion of blood sugars between 80 and 120 mg/dl.



**IV Insulin Infusion in Bariatric Surgery**

	Off Protocol Pt.# 1-5	On Protocol (Algorithms 1-5)Patient #1-5	On Protocol (Algorithms 1-8) Patient #6-14
Average number of blood glucose finger sticks.	11	26	25
Average number of hours on insulin infusion.	28	28	34
Average blood glucose while on insulin infusion.	147 mg/dL	131 mg/dL	117 mg/dL
The percent of blood glucose results within goal.	NA	49%	74%
The percent compliance with time to goal within 4 hours.	40%	40%	88%
The percent of hypoglycemia	0	0	2.2%

**P-67.**

**OUTCOMES IN BARIATRIC SURGERY: IMPROVEMENT IN STEATOHEPATITIS AND LIVER FIBROSIS**

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**Background:** Obesity and its hepatic manifestation, non-alcoholic fatty liver disease (NAFLD) has become an epidemic. Early stages of NAFLD can progress to more severe stages (non-alcoholic steatohepatitis (NASH) and cirrhosis) if there is no change in patient weight. The extent of the impact of bariatric surgery on the natural history of NAFLD has not been determined. Aim: To determine the extent of the impact of bariatric surgery on the histological features of NAFLD in obese patients.

**Methods:** Data on 87 patients who underwent a liver biopsy during abdominal surgery(e.g. hernia repair, small bowel obstruction, anastomatic revision) subsequent to index bariatric

procedure were analyzed. Histological features of these post-bariatric liver biopsies were compared to those from routine liver biopsies taken during the index bariatric procedure. Steatosis, lobular inflammation, hepatocyte ballooning and fibrosis were reported as per the Non-alcoholic Steatohepatitis Clinical Research Network Scoring System.

**Results:** 87 patients (83% women, 17% men, mean age  $50 \pm 0.1$  yrs, and BMI  $56 \pm 1.6$  Kg/m<sup>2</sup>) underwent bariatric surgery from 1998-2008. Post-bariatric liver biopsies were taken at a median of 23 (6-60) months after bariatric surgery. Biopsies from 36/87 after bariatric surgery did not show any significant abnormalities compared to only 5/87 pre-bariatric patients. Similarly, post-bariatric liver biopsies in 51/87 patients exhibited: steatosis (24), hepatitis (11), fibrosis (14) and cirrhosis (2). Routine liver biopsies during the index bariatric procedure in 82/87 patients exhibited: steatosis (60), hepatitis (14), fibrosis (17) and cirrhosis (2).

**Conclusion:** Surgically-induced weight loss reduces the prevalence of NAFLD in obese patients. These data suggest that bariatric surgery may halt the progression of NAFLD, from steatosis to NASH and fibrosis.

## **P-68.**

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### **SAFETY AND EARLY OUTCOMES OF LAPAROSCOPIC BARIATRIC SURGERY IN MORBIDLY OBESE ADOLESCENTS**

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**Background:** 2003-2004 National Health and Nutrition Examination Survey, indicate that an estimated 17% of children and adolescents ages 2-19 years are overweight in the US. We aim to assess the safety and outcomes of laparoscopic bariatric surgery as a treatment option in controversial patient population.

**Methods:** After IRB approval and following HIPPA guidelines we conducted a retrospective review of prospectively collected database of all adolescent patients that underwent Laparoscopic Bariatric Surgery (LBS) at the Bariatric and Metabolic Institute. Data included age, sex, initial body mass index, postoperative body mass index, initial weight, excess weight loss (EWL), co-morbid conditions, type of procedure performed and postoperative complications. Follow-up time, 2 weeks and 43 months.

**Results:** Between September 2003 and July 2008 a total of 2246 patients underwent LBS of these 20 were adolescents. Mean age 17 (12-18) years. 9 (45%) of these patients underwent a Laparoscopic Sleeve Gastrectomy (LSG), 8 (40%) patients underwent a Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) and 2 (10%) patients underwent a Laparoscopic Adjustable Gastric Band (LAGB). Mean preoperative BMI was for LSG 46.78 (40.7-52), for LRYGBP 47.2 (29.6-61) and for LAGB 38.75 (33.8-43.7) Mean postoperative BMI for LSG was 24.66 (20.2-27.2), for LRYGBP was 38.38 (23.1-53.5) and for LAGB was 28.05 (20.6-35.5). Mean preoperative weight was for LSG 269.53 (210-291.8) lb, for LRYGBP was 295.25 (237-250) and for LAGB was 293.7 (256.4-331) lb. Mean weight loss was 55.13 (7.8-84.6) lb. for LSG, 90.5 (23.8-143.4) lb for LRYGBP and 80.9 (61.4-100.4) lb. for LAGB. Two of the LAGB patients required revisional surgery for slippage and failure of weight loss. No morbidity nor mortality in this

series.

**Conclusion:** LBS appear to be a safe and effective treatment option for morbidly obese adolescents.

## P-69.

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### **ASSOCIATION OF BODY MASS INDEX AND LIPID PROFILES: EVALUATION OF A BROAD SPECTRUM OF BODY MASS INDEX PATIENTS INCLUDING THE MORBIDLY OBESE**

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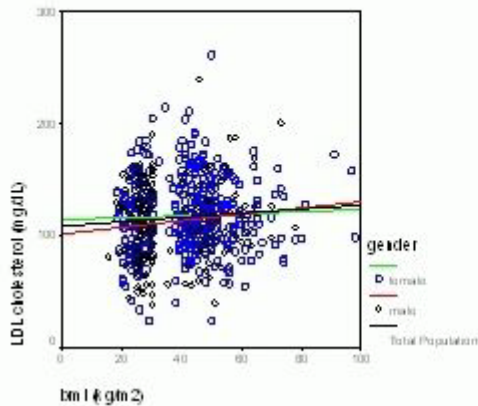
**Background:** Prior epidemiologic studies have shown that increasing body mass index (BMI) is associated with higher total cholesterol (TC) and low-density lipoprotein cholesterol (LDL). However, these studies were limited by under-representation of obese subjects. Objective: To determine whether there is an association between BMI and lipid profiles in a population of patients with a broad spectrum of BMI values.

**Methods:** A case-control study was performed utilizing patients seen at the Cleveland Clinic Florida. Cases (BMI >30 kg/m<sup>2</sup>) were obtained from the obesity surgery database between August 31, 2000 and April 4, 2002. Controls (BMI ≤ 30 kg/m<sup>2</sup>) were obtained from a database of primary care physicians between March 1, 2004 and November 18, 2004. Pearson correlation coefficients were used to assess the relationship between BMI and lipid fractions. Multiple linear regression was performed to assess the independent effect of BMI on lipid levels, while adjusting for potential confounders and propensity scores.

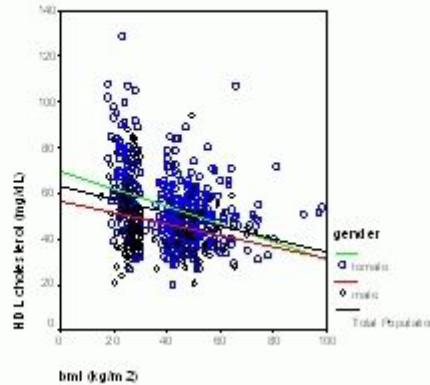
**Results:** Six hundred and thirty-seven patients were analyzed (female 362 [57%]). There was no association between higher BMI and LDL (r=0.19 p= 0.07), a negative association with HDL (r=0.45,p<0.001) and a positive association with the log transformation of TG (r=0.32,p=0.005).

**Conclusion:** Higher BMI was inversely associated with HDL and directly associated with TG. BMI showed no significant association with LDL. While the association between BMI and both HDL and TG may be explained by insulin resistance, the lack of a significant association between BMI and LDL remains an unexpected finding that requires further investigation.

**Figure 1. BMI vs. LDL cholesterol, overall and by gender**



**Figure 2. BMI vs. HDL cholesterol, overall and by gender.**



**P-70.**

## **DIABETES/PREDIABETES DOES NOT PRECLUDE IMPROVED CARDIOVASCULAR AUTONOMIC NERVE FUNCTION POST WEIGHT LOSS AT 18 MONTHS FOLLOW-UP**

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**Background:** Reduced heart rate variability (HRV) is the earliest indication of cardiovascular autonomic dysfunction with clinical manifestations including orthostatic hypotension, silent myocardial ischemia, and increased risk of mortality. We have previously reported that improved HRV was maintained 18 months after weight loss surgery and was similar for those with and without diabetes. Whether the maintained improvement in HRV differs for individuals with diabetes/prediabetes (hyperglycemic) versus those without diabetes (euglycemic) has not been addressed.

**Methods:** Subjects (n=30; [n=23 Roux-en-Y gastric bypass, n=7 gastric banding]) were aged 45±10 (mean±SD) yrs. Nine had a history of diabetes, while the remainder were classified based on a fingerstick fasting glucose at baseline. HRV (a measure of vagal tone) was assessed during deep breathing (i.e., mean circular resultant [MCR] and the expiration/inspiration [E/I] ratio).

**Results:** ANOVA for repeated measures indicated improved autonomic function (E/I ratio) over time (Table 1). Improvement was similar for both groups (p=NS [euglycemic vs. hyperglycemic] x time interaction).

**Conclusion:** Glucose dysmetabolism does not preclude an improvement in HRV following surgically induced weight loss. Since autonomic dysfunction is associated with early glucose dysmetabolism, an improved autonomic profile in response to weight loss may result in a reduced incidence of serious diabetes complications.

Table 1. Change in Heart Rate Variability Over 18 Months

	MCR	MCR	E/I Ratio	E/I Ratio
	Euglycemic (n=6)	Hyperglycemic (n=24)	Euglycemic (n=6)	Hyperglycemic (n=23)
Baseline	59±14	46±31	1.31±.11	1.24±.17
6 months	68±26	56±32	1.42±.26	1.32±.17
12 months	71±26	63±32	1.36±.15	1.34±.17
18 months	73±26	56±29	1.38±.19	1.33±.17

p=0.066 time effect for MCR; p=0.039 time effect for E/I ratio

### P-71.

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#### **DOES DUODENAL-JEJUNAL BYPASS(DJB) EFFECT ON TYPE 2 DM WITH BMI <30 KG/M2 IN KOREAN?**

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**Background:** Although insulin resistance has been shown to be a primary defect causing Type 2 DM in Caucasians, impaired insulin secretion has also been known to be an important factor in the development of Type 2 DM especially in Korean. A stomach preserving Duodenal-Jejunal Bypass has been issued for the resolution of type 2 DM since Rubino has reported as a prospective trial.

**Methods:** The hospital IRB approved the study and we started a prospective trial to evaluate efficacy of laparoscopic DJB for treatment of type 2 DM in patients with BMI 23-29kg/m<sup>2</sup>. Our endocrinology department referred patients who have uncontrolled type 2 DM. The operation were performed as same as Rubino's procedure except 100cm Roux limb's length instead of 50cm. FBS, HbA1c, weight, DM medications were measured at preoperatively and 1,3,6 months postoperatively. OGTT, insulin and incretin(GLP-1, GIP) response at each test were measured.

**Results:** 5 patients were all men with average age of 52years(44-64) and an average BMI of 25kg/m<sup>2</sup>(22.7-28.8). Average duration of diabetes were 6years. By the 1 month after surgery, all patients showed improved glycemic control and lowered their amount of medications or stopped insulin injection. In all patients, the HbA1c were <6.4% at 6months postoperatively. OGTT, response of incretin will be presented in the future.

**Conclusion:** Laparoscopic DJB as a metabolic procedure is a feasible and promising improvement of uncontrolled type 2 DM with lower BMI(23-29) in Korean. Additional studies are necessary to assess the change of gut hormone and the long-term efficacy of this operation.

### P-72.

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#### **INTERMITTENT VAGAL BLOCKADE WITH AN IMPLANTABLE DEVICE IMPROVES GLYCEMIC CONTROL IN OBESE SUBJECTS WITH TYPE 2 DIABETES**

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**Background:** An implantable device that intermittently blocks intra-abdominal vagal trunks has been shown to cause significant excess weight loss (EWL) in obese subjects. The aim of this analysis was to assess the effect of VBLOC therapy on glycemic control in obese subjects with type 2 diabetes mellitus (DM2).

**Methods:** Subjects were implanted at 5 centers in an open-label study. No dietary or behavioral consultation was used in order to isolate the effects of VBLOC therapy. Effects on HbA<sub>1c</sub> were evaluated at 1, 3 and 6 mo.

**Results:** To date, 6 subjects (4 females, age 46±5 yrs, BMI 42±2 kg/m<sup>2</sup>; mean±SE) have completed 6 mo follow-up. Mean EWLs were 9±2%, 11±2% and 12±1% at 1, 3 and 6 mo, respectively (P<0.05). HbA<sub>1c</sub> reductions were 1.4±0.4% (P<0.05), 1.3±0.3% (P<0.01) and 1.7±0.6% (P<0.05) at 1, 3 and 6 mo, respectively from a baseline of 8.7±0.9%. Four subjects were treated with hypoglycemic agents at baseline: therapy was reduced in 1. In all subjects, improvements in HbA<sub>1c</sub> were achieved and maintained. VBLOC therapy was well tolerated.

**Conclusion:** VBLOC therapy was associated with weight loss and sustained improvements in HbA<sub>1c</sub> in obese subjects with DM2.

### P-73.

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#### DIABETES MELLITUS AND INSULIN RESOLUTION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS

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**Background:** Laparoscopic Roux-en-y gastric bypass (LRYGB) has been shown to be effective in resolving and improving diabetes mellitus (DM) in many studies. This study investigates resolution and reduction of insulin use in patients undergoing LRYGB.

**Methods:** A retrospective review of 257 consecutive patients undergoing laparoscopic Roux-en-y gastric bypass (LRYGB) from October 2005 until July 2008 was done.

**Results:** Seventy patients (27.2%) who underwent LRYGB had DM. The mean BMI was 48.1 (range 38-67.3), mean age was 49 (range 26-65), and 80% were female. Twenty-five (35.7%) patients were on insulin. The mean insulin dosage was 101 units (range 18-277). Overall, 53 patients (75.7%) resolved their DM. In patients who did not require insulin preoperatively all but one patient (97.7%) had resolution of their DM. In patients who were insulin dependent preoperatively, eleven (44%) no longer required insulin although two still required one of their

preoperative oral medications. In the remaining 14 patients (56%) whose DM improved the mean insulin dosage decreased from 99 +/- 48 units to 26 +/- 18 units postoperatively (p<0.01). EBMIL% among this group of diabetic patients at 3, 6, and 12 months was 41%, 55%, and 67%, respectively.

**Conclusion:** DM is resolved in nearly all non insulin dependent diabetic patients after LRYGB. More than 40% of insulin dependent diabetics may no longer require insulin after LRYGB. Of those that still do require insulin there is a nearly 75% reduction in insulin dosage postoperatively.

#### P-74.

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### **LAPAROSCOPIC REVISIONAL BARIATRIC SURGERY WITH THE USE OF AN ADJUSTABLE GASTRIC BAND (LAGB) OVER A PRIMARY ROUX EN Y BYPASS (RYGB)**

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**Background:** Twenty percent of successful Roux en Y Bypass patients experience weight regain in the post-operative period. Concomitant reestablishment of co-morbidities occurs with significant weight regain. Pouch size, stoma size and limb length are variables that have been surgically altered with limited success. The addition of an adjustable gastric band to an existing Roux en Y gastric Bypass may be a useful technique to reestablish weight loss

**Methods:** Patients with prior successful RYGB with weight regain were examined and evaluated by our bariatric team. After EGD, UGI and assessment, seven patients were offered band over bypass. Our retrospective analysis involves the seven patients (6 female, 1 male) over a two year time frame. Charts were evaluated for prior weight loss, weight loss after placement of LAGB, change in BMI and %EWL recorded through interval follow up visits. Complications, surgical time, and LOS were noted

**Results:** All patients were followed on an interval basis with one-hundred percent compliance. Six primary cases were done open. All band placements were laparoscopic. The average time between bypass and band, age, amount of weight regained, and weights were documented. Mean BMI at time of revision was 47. The average %EWL was 43 % and average change in BMI was 12. No complications were recorded.

**Conclusion:** The placement of band over bypass reestablishes weight loss in patients selected and followed in a weight loss program with proper education and adequate instruction. The laparoscopic placement of band over bypass is a viable option for patients with weight regain.

#### P-75.

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### **122 CONSECUTIVE LAPAROSCOPIC REVISIONAL BARIATRIC SURGICAL PROCEDURES IN A U.S. CENTER**

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Ashley Vernon, MD; Haley Hathaway, BABS; Kerri Clancy, MD; David B. Lautz, MD;  
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**Background:** Commensurate with the growing number of patients undergoing bariatric surgical procedures is the resulting increase in patients who will subsequently require a revisional procedure. The laparoscopic approach is now our initial approach for all revisional procedures. We sought to evaluate our experience to date with a laparoscopic approach to revisional bariatric surgery.

**Methods:** Using an institutional prospective database, a retrospective review of all consecutive patients from January 2001 to October 2008, who underwent laparoscopic bariatric surgical revisions was performed. Patient demographics, indications for revision, 30-day morbidity, and percent excess body weight loss results (EBWL) following the revision were determined for each group.

**Results:** We have performed 122 consecutive laparoscopic bariatric surgical revisions. These cases were separated into groups of laparoscopic adjustable gastric band revisions (LAGBr), conversions of LAGB to laparoscopic Roux-en-Y gastric bypass (LAGBc), and revisions of previous Roux-en-Y gastric bypass or previous gastric partitioning procedures with conversion to RYGBr. The results for each group are shown in the table.

**Conclusion:** The majority of revisional bariatric surgical procedures can be performed laparoscopically, even if the initial procedure was performed in an open fashion. Perioperative morbidity was highest in the most technically complex procedures, as expected. Laparoscopic revisional bariatric procedures can be performed with acceptable perioperative morbidity and mortality rates.

Case	N	Pre-op BMI	OR time (hours)	LOS (days)	F/U (months)	EBWL (%)	Conversions	Complications, major	Mortality
LAGBr	23	46.5	1:44	1.33	10.7	20	0	0	0
LAGBc	24	41.2	3:05	3.0	5.54	21	1	1	0
RYGBr	75	43.4	3:95	3.95	8.11	12	2	10	0

**P-76.**

**LAPAROSCOPIC CONVERSION OF VERTICAL BANDED GASTROPLASTY TO GASTRIC BYPASS CAN BE PERFORMED SAFELY IN PATIENTS OVER AGE 60**

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**Background:** Vertical banded gastroplasty (VBG) is associated with a significant re-operation

rate for complications, most commonly weight regain and reflux. For these patients, conversion to Roux-en-Y gastric bypass (RYGB) has been shown to be beneficial. We reviewed our results of patients over 60 years of age who underwent laparoscopic revision of VBG to RYGB.

**Methods:** A retrospective review of a single center's experience was conducted. The records of all patients > 60 years of age undergoing conversion of VBG to RYGB between 10/04 until 9/07 were reviewed. Anthropometric data, office visits, operative reports, and outside records were reviewed.

**Results:** Ten patients underwent laparoscopic conversion of VBG to RYGBP during the study period. Mean age was 63 (range 60-68). Nine patients were female. Mean preoperative BMI was 48 kg/m<sup>2</sup> (range 32-74 kg/m<sup>2</sup>). Indication for conversion was weight regain in 7 patients and unremitting GERD in 3 patients. Postoperative complications occurred in 4 patients. These included a leak, a stricture requiring dilation, and two wound infections. There were no mortalities. Nine patients had one year follow-up data. At a median follow-up of 12 months (range 7 to 18 months), mean BMI was 36 kg/m<sup>2</sup> (range 24-52 kg/m<sup>2</sup>). All patients operated for GERD had improved symptoms. The average operative time was 358 min and the average length of stay was 8.6 days.

**Conclusion:** Though technically challenging, laparoscopic conversion of VBG to RYGBP in the elderly patient can be performed safely. Advanced age should not be considered a contraindication to laparoscopic conversion of VBG to RYGB to treat weight regain or VBG related complications.

**P-77.**

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## **MANAGEMENT OF VERTICAL BANDED GASTROPLASTY COMPLICATIONS BY CONVERSION TO ROUX-EN-Y GASTRIC BYPASS**

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**Background:** The incidence of complications following VBG is up to 35%. Patients with complications following VBG or weight regain may undergo conversion to RYGB. This study assesses the effectiveness and complications associated with conversion of VBG to RYGB.

**Methods:** Retrospective analysis of 24 consecutive patients (pts) undergoing VBG to RYGB over a 24 months at large tertiary care hospital.

**Results:** 17/24 pts were female and 7/24 were male. 16/24 of the cases were completed laparoscopically and 8/24 were open cases. The mean age of the group was 48.4 years and mean time since original VBG operation was 10.9 years. Indications for revision of VBG were proximal gastric outlet obstruction (24/24), reflux/nausea (19/24), weight regain (15/24), abdominal pain (9/24). Pre-operative endoscopic findings included eroded silastic bands (12/24), and a gastro-gastro fistula (9/24). The mean BMI of the group at VBG was 46.7 and at RYGB was 41.7. Co-morbidities at time of RYGB included HTN (15/24), GERD (13/24), hyperlipidemia (12/24), arthritis (10/24), diabetes (6/24), sleep apnea (7/24). The mean OR time for RYGB was 4.1 hours. Length of stay averaged 3.4 days. Post-op complications included a GJ anastomotic stricture (1/24), incisional hernia (2/24) and perigastric fluid collection (1/24). The

mean follow-up from RYGB was 6.3 months and average excess weight loss was 49.5 lbs. 14/24 patients had an improvement of co-morbidities after RYGB including HTN (7/24), diabetes (3/24), sleep apnea (2/24), and arthritis (2/24).

**Conclusion:** Conversion of VBG to RYGB is a safe and viable option in treating weight regain and VBG complications. Weight loss and improvements in co-morbidities are significant after conversion to RYGB. Conversion of VBG to RYGB has a low complication rate, however, these complex cases require longer operative times and length of stays.

**P-78.**

**CHANGE OF INTRA-ABDOMINAL FAT AFTER BARIATRIC SURGERY**

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**Background:** Metabolic syndrome is world-wide accepted concept of diseases. Main cause of metabolic syndrome is central obesity. Asian populations have a higher percentage of fat for a given weight and are predisposed to abdominal adiposity. And abdominal adiposity strongly related to co-morbidities. We studied effect of bariatric surgery for intra-abdominal fat of Asian populations.

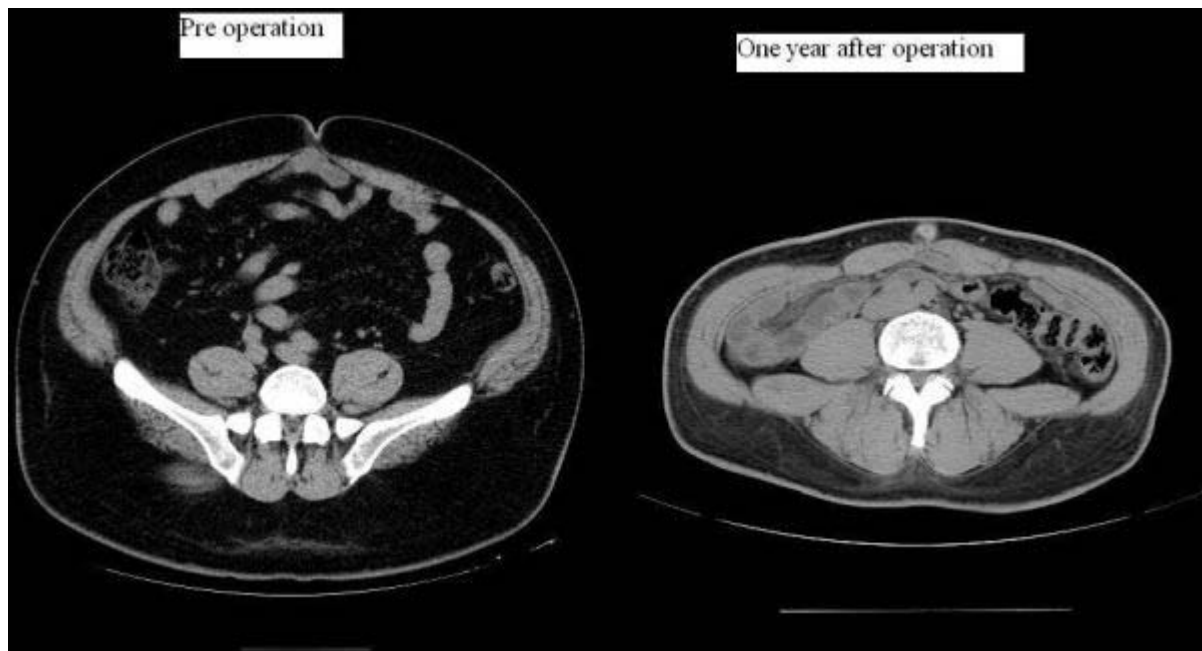
**Methods:** Abdominal CT scans were performed pre and 1 year after surgery. Area of intra-abdominal fat (IAF) and subcutaneous fat (SCF) at the level of umbilicus were measured. Resolutions of co-morbidities are also checked.

**Results:** Forteen patients were enrolled in this study between 2007/02 and 2007/10. Six of them underwent LRYGBP, two are LAGB, five are LSG and one is LSG with Duodenojejunal bypass. Half of them are female. All patients had IAF over 10000mm<sup>2</sup>, metabolic syndrome criteria before surgery. All of them became IAF less than 10000mm<sup>2</sup>. Twelve of them were diagnosed as fatty liver in CT image by the radiologist before surgery but no patient was diagnosed at 1 year after surgery. Resolution of T2DM was 100 %, Hypertension was 100 %, and Hyperlipidemia was 90%.

**Conclusion:** Bariatric surgery can reduce more intra-abdominal fat than subcutaneous fat in Asian population. Reduction of intra-abdominal fat can improve co-morbidities of morbid obesity patients in Asia.

Change of parameter

	BW(kg)	BMI	Fat ratio (%)	Total fat (mm <sup>2</sup> )	IAF (mm <sup>2</sup> )	SCF (mm <sup>2</sup> )	IAF/SCF
PreOpe	124.9	43.0	43.1	74348	19044	55305	0.34
one year	79.8	27.7	26.7	26659	3777	22811	0.18



CT image at the level of umbilicus

**P-79.**

### **PROTEOMIC PROFILES TO DISTINGUISH BETWEEN OBESE AND HEALTHY SUBJECTS? PRELIMINARY RESULTS**

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**Background:** Obesity is a complex, still poorly understood disease. Recently FTO (fat mass and obesity associated gene) was identified as the first locus harboring common variants with an unequivocal impact on obesity predisposition and fat mass. This study was aimed to investigate whether obese people bear peculiar proteomic profiles when compared with healthy non-obese people.

**Methods:** Using Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry (MALDI-MS), the serum of 30 obese subjects and 30 healthy subjects were analyzed in order to verify the presence of some differences in the low molecular weight serum protein profile.

**Results:** The analysis showed that major differences can be obtained in terms of the relative abundance of the species at m/z 655, 740, 905, 1518. In particular an under expression of the specie at m/z 655 seems to be peculiar of obese subjects.

**Conclusion:** Our data suggest that some ionic species detected by MALDI-MS in the serum of patients affected by obesity could be of interest for a more complete molecular classification of this complex disease and might provide new information for the development of clinical diagnostic and prognostic tools.

## P-80.

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### **VERY LOW OR LOW CALORIES DIET BEFORE BARIATRIC SURGERY?**

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**Background:** Very Low Calorie Diets (VLCD) are considered effective to reduce weight before bariatric surgery. The major flaw is patients' compliance to a too strict regimen. Low calories diets (LCD), much better tolerated, could give the same results with less discomfort. This study was designed to verify this hypothesis.

**Methods:** This is a prospective study to assess the diet compliance of two homogeneous groups of patients treated with 2 different dietary schemes (3344 Kj/d vs 543304 Kj/d) 30 days before bariatric surgery. BMI variations were assessed at clinic 15 and 30 days after starting the diet and surgery was then offered.

**Results:** Eighty obese subjects matched for age, sex and BMI were divided into 2 groups and given alternatively VLCD (A) and LCD (B). The mean BMI loss was  $2.2 \pm 1.8$  Kg/m<sup>2</sup> in Group A and  $0.9 \pm 1.8$  Kg/m<sup>2</sup> ( $P < 0.05$ ). Drop out rate was 7.5% for group A and 10% for B, respectively.

**Conclusion:** VLCD proved to be well tolerated and more effective than LCD to reduce weight right before bariatric surgery.

## P-81.

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### **INTERMITTENT VAGAL BLOCKADE WITH AN IMPLANTABLE DEVICE IMPROVES BLOOD PRESSURE IN OBESE SUBJECTS**

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**Background:** An implantable device that intermittently blocks intra-abdominal vagal trunks has been reported to cause significant excess weight loss (EWL) in obese subjects. The aim of this analysis was to assess effects of VBLOC therapy on elevated systolic (SBP) and diastolic blood pressure (DBP) in obese subjects.

**Methods:** Implants occurred at 4 sites. BP effects were assessed at 1, 3 and 6 mo. Hypertension (HT) and pre-HT were defined by JNC-7 guidelines or if subjects had HT on treatment.

**Results:** To date, 26 subjects (BMI  $41 \pm 1$ ; mean  $\pm$  SE) had 6 mo follow-up. Mean EWL

reductions were  $10\pm 1$ ,  $17\pm 2$  and  $21\pm 3\%$  at 1, 3 and 6 mo, respectively ( $P<0.001$ ). HT subjects ( $n=15$ ) had SBP reductions of  $14\pm 5$ ,  $11\pm 5$  and  $13\pm 5$  mmHg at 1, 3 and 6 mo, respectively (all  $P<0.05$ ) from a baseline of  $136\pm 5$  mmHg. DBP reductions were  $11\pm 2$  ( $P<0.001$ ),  $6\pm 3$  ( $P=0.05$ ) and  $6\pm 2$  mmHg ( $P<0.05$ ) at 1, 3 and 6 mo, respectively from a baseline of  $87\pm 2$  mmHg. HT and pre-HT subjects combined ( $n=21$ ) had reductions in SBP of  $12\pm 4$ ,  $11\pm 4$  and  $10\pm 4$  mmHg at 1, 3 and 6 mo, respectively (all  $P<0.05$ ) from a baseline of  $133\pm 4$  mmHg.

**Conclusion:** VBLOC therapy resulted in clinically significant reductions in BP in obese subjects with either HT or pre-HT. Improvements occurred early in the course of weight loss and were sustained.

## P-82.

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### INTERNAL DISINHIBITION (ID) PREDICTS WEIGHT LOSS IMMEDIATELY FOLLOWING BARIATRIC SURGERY

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**Background:** The Eating Inventory disinhibition subscale measures eating in response to emotional, cognitive, or social cues (as opposed to physiological need). Recently, the disinhibition scale was shown to be composed of an “internal” factor (ID) and an “external” factor (ED). ID describes eating in response to internal thoughts and feelings, such as negative emotions. ED describes eating in response to external situations, such as the smell of food or the presence of people who are overeating. Participants with high ID scores lose less weight in behavioral weight loss programs.

**Methods:** The Eating Inventory was administered to 16 patients (93.8% female; M age=49.0y; M BMI=48.4)  $\geq 6$  wks before, and 3-months after Roux-en-Y gastric bypass (RYGB;  $n=8$ ) or Lap-Band ( $n=8$ ) surgery. Predictors of 3-month weight loss were investigated via linear regression.

**Results:** Participants on average weighed 127 kg preoperatively, and lost 34.3% of their excess weight at 3-mos postoperatively. Both ID and ED decreased significantly following surgery ( $p<.001$ ). Patients who scored highest on ID before surgery and then experienced the largest decrease in ID after surgery had the best initial weight losses ( $R^2=0.81$ ,  $p<0.001$ ). ED did not predict weight loss after surgery.

**Conclusion:** ID (but not ED) predicts weight loss among bariatric surgery patients. These results suggest that patients who eat in response to negative thoughts and feelings prior to surgery, but are able to decrease this eating behavior following surgery, experience optimal post-operative weight loss.

P-83.

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**ASSOCIATION OF WEIGHT AND BLOOD NUTRIENT CONCENTRATIONS IN A REPRESENTATIVE US ADULT POPULATION: RESULTS FROM THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES), 1999-2004**

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**Background:** Nutrient cofactors play an essential role in human metabolism. The purpose of this study was to present the mean levels of various micronutrients across different weight classes and to determine the impact of weight on micronutrient status.

**Methods:** Using NHANES 1999-2004, we determined the mean concentrations of serum vitamins B12, B6, C, A, E and RBC folate for each weight group. Normal overweight, obesity class 1, obesity class 2 and obesity class 3 were defined as a BMI of <25, 25.0-29.9, 30.0-34.9, 35.0-39.9, and >40.0 kg/m<sup>3</sup>, respectively. The role of weight on micronutrient concentration was examined using linear regression.

**Results:** Micronutrient concentration for all vitamins, with the exception of red blood cell folate, was significantly reduced among individuals in the highest obesity class compared to those with BMI<25. With normal weight individuals as a reference, we observed a linear relationship between vitamin C level and weight class where each increase in overweight and obesity class is significantly associated with decreased nutrient concentration. Specifically, individuals with BMI<25, 25.0-29.9, 30.0-34.9, 35.0-39.9 and >40.0 had a mean vitamin C level of 40.2, 34.6, 28.8, 26.3 and 22.9 mg/dL, respectively (p<0.01). A similar trend was also observed across the three obesity classes with respect to normal weight individuals for vitamin B12(p≤0.01). Vitamin B6 concentrations also significantly decreased from 48.4 nmol/L (normal) to 39.7 (class 1), 30.2 (class 2) and 30.8 nmol/L (class 3) (p≤0.01).

**Conclusion:** Individuals in the highest obesity class had the lowest concentration of serum vitamin B12, vitamin B6, vitamin C, vitamin A and vitamin E compared to the normal weight class, and are thus, most likely to be at risk for comorbidities associated with suboptimal nutrient status.

P-84.

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**WEIGHT LOSS & EVOLUTION OF CO-MORBIDITIES & QUALITY OF LIFE FOLLOWING SLEEVE GASTRECTOMY FOR MORBID OBESITY WITH TYPE 2 DIABETES MELLITUS : RESULTS AT MORE THAN 3 YEARS**

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**Background:** Sleeve gastrectomy (SG) is becoming popular as a stand alone procedure for the treatment of morbid obesity & related diseases. This study presents the outcome of SG with regards to weight loss and improvement in co-morbidities and quality of life (QOL) at the end of

3 years after surgery.

**Methods:** Retrospective study of 23 patients ( M : F = 8 : 15 ) of morbid obesity (Mean BMI =  $49 \pm 11$  kg / m<sup>2</sup> ) with type 2 Diabetes operated for SG during the period 2004 to 2005 is performed with regards to percent excess weight loss ( %EWL), changes in co-morbidity status & QOL at the end of 3 years. BAROS score has been calculated.

**Results:** % EWL at 36 months was 74.578%. 16 / 23 Pts demonstrated significant improvement in all co-morbidities and the rest ( 7 / 23 ) showed at least one major co-morbidity improvement. All ( 23 / 23 ) referred improvement in their QOL but , not equally in all parameters of the questionnaire. BAROS total out come score was good in 4/23 ( 17.39%), very good 4/23 ( 17.39% ), and excellent 15/23 ( 65.22% ).

**Conclusion:** SG has demonstrated to be highly effective in improving weight loss, co-morbidities and also the QOL.

**P-85.**

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### **LAPROSCOPIC SLEEVE GASTRECTOMY AS A WEIGHT LOSS OPTION IN THE ELDERLY HIGH RISK SEVERELY OBESE PATIENT**

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**Background:** Laparoscopic sleeve gastrectomy (LSG) is increasing in popularity as a therapeutic option for the obese, high risk patient. There is scarce data, however, describing LSG in the elderly population (age >60). We evaluate our LSG experience in this cohort.

**Methods:** Single institution administrative databases were examined to identify patients  $\geq 60$  years of age who underwent a LSG. Relevant outcome information was obtained from retrospective review of patients' charts using electronic medical records. Patients  $\geq 1$  year out from the date of surgery were evaluated.

**Results:** Between April 2005 and August 2008, 42 patients had a LSG; 22 patients were  $\geq 1$  year since surgery. The mean preoperative age, weight, and BMI were 65 yrs, 132 Kg, and 52 Kg/m<sup>2</sup> (n=22) respectively. The mean %EWL at 12 months was  $40.8\% \pm 13.5\%$ , 95% CI:[37.7, 43.7]. At 6 months from operation, the mean drop in BMI was  $9.5 \pm 3.0$  Kg/m<sup>2</sup> (n=14) as compared to the 12 months decrease of  $11.9 \pm 3.1$  Kg/m<sup>2</sup> (n=9)(p=0.001). Mean 6 and 12 month BMI values were  $40.7 \pm 5.5$  Kg/m<sup>2</sup> and  $38.2 \pm 5.8$  Kg/m<sup>2</sup>, respectively, for patients with both measurements (n=9); and these were both statistically different from preoperative values (p< 0.0001). The most common indication for LSG was severe obesity in a high risk patient with multiple comorbidities (mean= 5 comorbidities). Average OR time was 169 minutes; mean hospitalization was 6 days. There were 2 late mortalities (>3 months from operation). No other major complications were seen. In patients with preoperative HbA1c levels >6% (n=12), HbA1c improved from a preoperative mean of  $7.5\% \pm 1.3\%$  to  $6.1\% \pm 0.9\%$  6 months after surgery (p=0.04).

**Conclusion:** LSG can result in shortened OR time, significant weight loss, and improvement in comorbidities on 1 year follow up. LSG also appears to be an acceptable strategy for weight loss in the elderly high risk patient population.

**P-86.**

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**PREVALENCE OF NUTRITIONAL DEFICIENCIES AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY AS A FINAL STEP IN MORBIDLY OBESE PATIENTS**

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**Background:** Laparoscopic sleeve gastrectomy has been recently advocated as a final step in the treatment of morbid obesity. Reports of long-term complications and nutritional deficiencies are yet to be determined. The aim of this study was to evaluate the prevalence of nutritional deficiencies after sleeve gastrectomy.

**Methods:** This was a retrospective study of a prospectively collected database that underwent IRB approval and was conducted following HIPPA guidelines. Between August 2005 and July 2008 the charts of all patients that underwent laparoscopic sleeve gastrectomy were reviewed for nutritional deficiencies and surgical complications.

**Results:** 218 patients were included in this analysis. Follow up was conducted at 3 months, 6 months, 12 months and on a yearly basis after. The average preoperative BMI was 50.5 (33-58), the average age was 46.2 years (20-65), sex distribution was: F= 151/218, M= 67/ 218. All patients were subjected to a routine postoperative oral multivitamin supplementation. Both Thiamine (“vitamin B1”) and folate deficiency were identified each of which in one patient (0.4%). Vitamin D was deficient in 13 (5.9%) patients. All patients were asymptomatic and had an incidental diagnosis. No other medical or surgical complications were identified in this patient population after three years follow up.

**Conclusion:** Though rare and not significant, nutritional deficiencies can occur in morbidly obese patients undergoing sleeve gastrectomy. Laparoscopic sleeve gastrectomy has a significantly lower incidence of long-term complications when compared to other well established bariatric procedures.

**P-87.**

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**POST OPERATIVE VITAMINS AND NUTRITIONAL ASSESSMENT 1 YEAR AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY**

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**Background:** Laparoscopic sleeve gastrectomy(LSG)was introduced as the first of 2-stage procedure for high-risk patients. Vitamin deficiencies after this procedure have not been well delineated. After LSG at our institution, many patients go on to have gastric bypass when maximum weight loss has been achieved or significant reduction of co-morbidities is

obtained. The aim of this study is to assess vitamin and nutritional changes following LSG at one year.

**Methods:** A retrospective review at a single center was conducted from 07/05-10/07 on patients who underwent LSG. Patients that were selected included those with 6 month and 12 month post-operative laboratory data. Evaluation of laboratory workup occurred post-operatively only, and included: complete blood count, complete metabolic profile, vitamin B12 and D, iron, total iron binding capacity, and transferrin saturation. All patients were started post-operatively on multivitamin therapy and calcium carbonate/vitamin D3.

**Results:** 90 LSG were performed. 65 patients were included in this study, that had 6 and 12 month laboratory testing post-operatively during their follow up visits. There was no decrease in serum albumin or significant abnormality in hemoglobin or hematocrit. There were no significant deficiencies in serum folate or RBC folic acid. 1 patient with an iron deficiency and 2 patients with vitamin B12 deficiency. Serum thiamine deficiency was found in 2 patients that developed severe post-operative emesis. 21 patients had vitamin D deficiency with abnormal parathyroid hormone elevation.

**Conclusion:** Short term follow up suggest a low incidence of clinically significant nutrient deficiency following LSG. However uncommonly thiamine deficiency may occur in the setting of severe post-operative emesis. Post-operative monitoring of vitamin D and parathyroid hormone may be warranted

**P-88.**

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### **HEPATIC ISCHEMIA FROM MESENTERIC TO PORTAL VEIN EMBOLISM FOLLOWING OPERATIVE CORRECTION OF SMALL BOWEL OBSTRUCTION DUE TO AN INTERNAL HERNIA IN A GASTRIC BYPASS PATIENT: A CASE REPORT**

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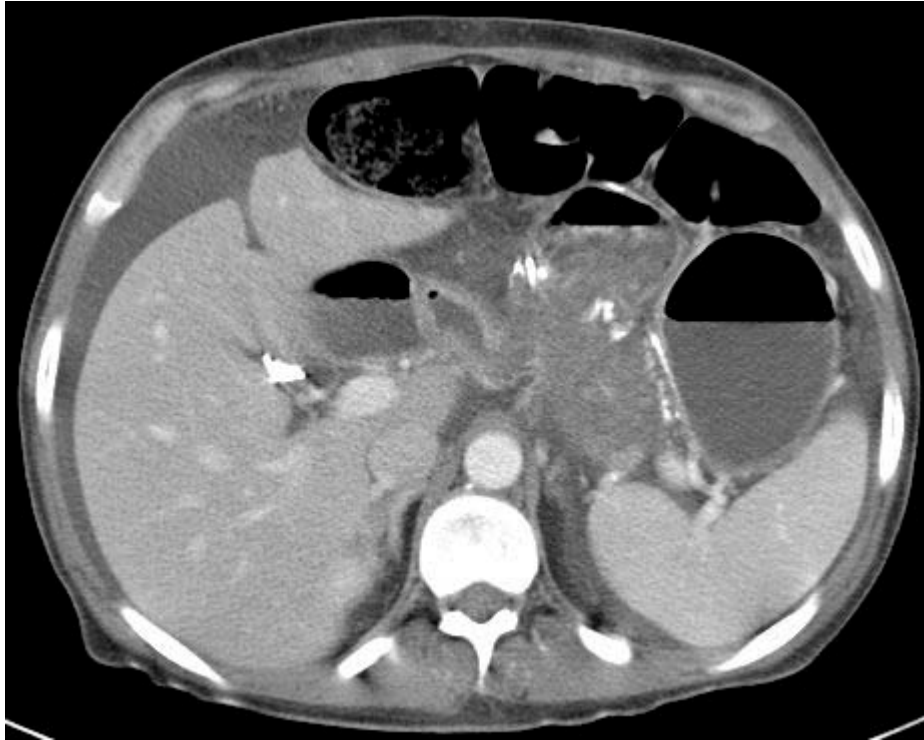
**Background:** Internal hernia and bowel obstruction are well-known complications of gastric bypass surgery. Early intervention is tantamount to successful management of these complications. Delayed intervention can lead to intestinal ischemia; however hepatic ischemia has not yet been described.

**Methods:** We are reporting the first case of portal vein thrombo-embolism following repair of an internal hernia and release of small bowel obstruction in gastric bypass patient. We present 37 year old female patient diagnosed with small bowel obstruction, 4 years after gastric bypass. Reduction of the massive internal hernia containing the entire length of small intestine distal to the jejunostomy and mesenteric defects were closed. She was discharged four days later with no ongoing symptoms. She returned to the hospital having new pain in right upper quadrant and repeat CT scan showed several wedge-shaped ischemic areas in the right lobe of the liver.

**Results:** The patient had an INR of 1.4, and so she received only low molecular weight heparin in prophylactic dosage. Repeat scan after one week showed clearance of the ischemic triangular areas in the liver.

**Conclusion:** Prolonged small bowel obstruction can lead to stasis and thrombosis in the

mesenteric vessels. Once there is release of the obstruction and establishment of the blood flow in these vessels can lead to embolism to the portal system. This is one of the unusual complications which can possibly be avoided with early diagnosis and intervention of the SBO in bariatric surgery patient.



Preoperative CT Scan with changes of SBO, free fluid in peritoneum and normal liver.



Post operative CT scan with areas of ischemic liver.

**P-89.**

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**DEVELOPMENT OF SYMPTOMATIC HIATAL HERNIA AFTER WEIGHT LOSS FROM LAPAROSCOPIC ROUX-EN Y GASTRIC BYPASS**

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**Background:** Hiatal hernia (HH) is a common cause of reflux and dysphagia. We report a series of patients that developed symptomatic HH after weight loss from laparoscopic Roux-en Y gastric bypass (LRYGB).

**Methods:** Retrospective review of a prospective bariatric surgery database of 1775 patients undergoing surgery between 1999 and 2008.

**Results:** Ten patients developed symptomatic HH after weight loss from LRYGB. Eighty percent were females and mean age was 54.9 years (range: 27 - 69). Mean BMI preoperatively was 43.9 kg/m<sup>2</sup> (range: 31 - 52). Eight patients had undergone primary LRYGB. Two patients underwent laparoscopic revision of Nissen fundoplication (one with prior Nissen revision & Collis gastroplasty) to RYGB. No HH were visualized at the time of original LRYGB. Presenting symptoms included: epigastric pain (80%), reflux (60%), dysphagia (50%), and retching (20%). Mean onset of symptoms from surgery was 35.2 months (range: 6.5 - 56) and median percent excess weight loss was 71.1% (range: 36.3 - 110.6). Studies that demonstrated HH included upper GI x-ray (9/10), computed tomography (5/10), and endoscopy (2/10). Laparoscopic hiatal hernia repair was performed in all patients; two had concurrent revision of the gastric pouch and gastrojejunostomy. Mean length of stay was 1.6 days. Symptoms resolved in 90% and improved in 10%.

**Conclusion:** Development of symptomatic HH after weight loss with RYGB may not be uncommon. Patients that develop symptoms of epigastric pain reflux, and dysphagia after LRYGB should be evaluated for HH. Hiatal hernias found at the time of LRYGB should be repaired.

**P-90.**

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**ABDOMINAL PAIN IN PREGNANT GASTRIC BYPASS PATIENTS: MRI AS AN EFFECTIVE TOOL FOR DETECTION OF INTERNAL HERNIAS**

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**Background:** Abdominal pain in pregnant patient presents a diagnostic challenge given the wide range of etiologies. A gastric bypass patient increases the possible diagnoses. Common causes of abdominal pain during pregnancy include, cholecystitis, appendicitis, small bowel obstruction and pancreatitis. In the patient with a previous history of a gastric bypass the causes also may include internal hernia. Ultrasound is the diagnostic modality of choice in pregnancy, but is unable to detect internal hernias. MR imaging during pregnancy has no deleterious effects to the

fetus, and in patients who need additional imaging in pregnancy, it has been advocated.

**Methods:** We have performed MR imaging in three pregnant gastric bypass patients to confirm internal hernias as the cause of abdominal pain. They were 20, 20 and 31 weeks pregnant, respectively. Two women were operated during their pregnancy by laparoscopy and laparotomy. The third completed the pregnancy, and then had a laparoscopic repair of internal hernia.

**Results:** MR imaging was used in three pregnant gastric bypass patients in order to diagnose the cause of the abdominal pain. Internal hernia with small bowel volvulus was diagnosed on all 3 studies. Two patients underwent reduction of volvulus and repair of internal hernia during pregnancy. The other was able to delay surgery until the postpartum period.

**Conclusion:** Abdominal pain during pregnancy in a gastric bypass patient creates a diagnostic dilemma. Magnetic resonance imaging is an important primary or adjuvant modality for evaluation of abdominal pain in pregnant patients with history of gastric bypass. The safety and efficacy have been demonstrated. Our experience has demonstrated its ability to assist in management of the patient. MR imaging should be the test of choice in a pregnant bariatric patient with abdominal pain to delineate the cause.



Not for diagnostic use

Swirling of mesenteric vessels noted in this MR image



Coronal view of internal hernia in a pregnant patient

**P-91.**

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### **TACHYCARDIA IN THE EARLY POSTOPERATIVE BARIATRIC SURGERY PATIENT**

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**Background:** Tachycardia is espoused to be a predictor of complications in the postoperative bariatric surgery patient. This study examines pulse rate as a predictor of complications.

**Methods:** A retrospective review of a single surgeon's first 175 gastric bypasses was performed. Maximum heart rates on postoperative days 1, 2 and 3 were determined. Heart rates were compared between patients with and without complications.

**Results:** The overall rate of immediate postoperative complications was 8.6%. No patient with maximum heart < 100 for three consecutive days had a complication. However, most patients (74%) had a heart rate of at least 100 at some point during their postoperative stay. The positive predictive value of a heart rate greater than 100 was only 11.6%, and sensitivity and specificity

were 100% and 28.8%, respectively.

**Conclusion:** Patients with maximum heart rates less than 100 are highly unlikely to have a complication. A patient heart rate of 120 is a reasonable cutoff suggesting a complication has occurred: approximately 20% of patients with heart rate greater than 120 had a complication, while 95% of patients with heart rate less than 120 did not have a complication. Profound tachycardia should prompt a thorough evaluation for the source.

	Sensitivity (%)	Specificity (%)	Positive Predictive Value (%)	Negative Predictive Value (%)
HR > 100	100	28.8	11.6	100
HR > 110	93.3	56.2	16.7	99
HR > 120	53.3	81.9	21.6	94.9
HR > 130	26.7	96.2	40	93.3
HR > 140	6.7	97.5	20	91.8

## P-92.

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### **INTERNAL HERNIA FOLLOWING LAPAROSCOPIC GASTRIC BYPASS: DIAGNOSTIC DIFFICULTIES AND PREVENTION OF OCCURRENCE**

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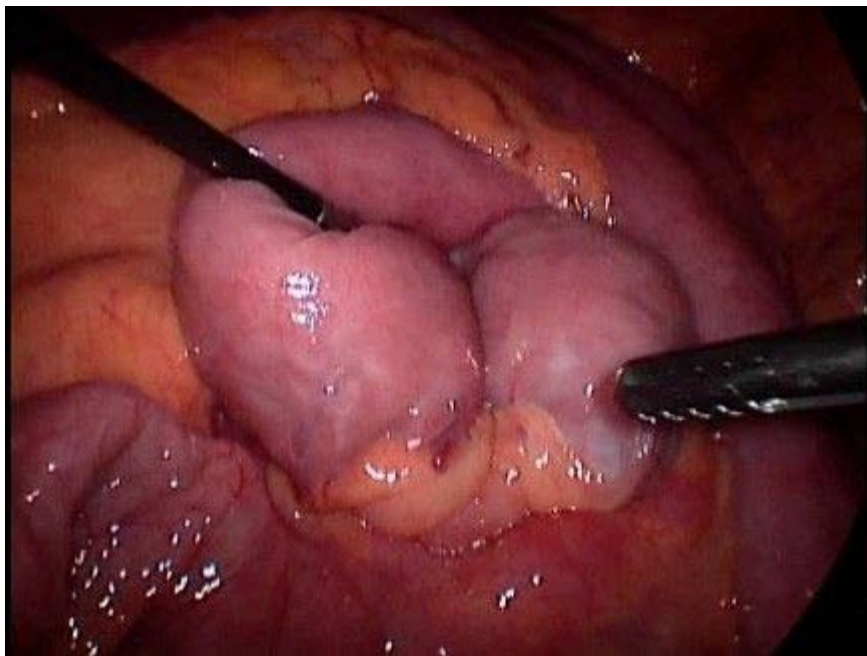
**Background:** Laparoscopic gastric bypass(GB) to treat morbid obesity has excellent outcomes. Laparoscopy develops fewer adhesions with higher internal hernia incidence after considerable weight loss. We aim to present the outcomes and address technical aspects of internal hernia formation.

**Methods:** We have performed 4,007 simplified gastric bypass(SGB) with all anastomosis in supramesocolic abdomen using 5 trocars in a lap anti-reflux fashion. First 700 cases were transmesocolic, subsequent cases were antecolic. We analysed prospective data for outcomes of internal hernia following SGB.

**Results:** From December, 2001 to March, 2008, 4,007 SGB were performed with 75.1% average EWL. Internal hernia incidence was 0.5%(20p) manifested as chronic postprandial pain or acute small bowel obstruction syndrome(SBO) in a mean of 18 months from surgery. There are

diagnostic difficulties for despite the abdominal pain, there is no vomiting or bowel habits alteration. Transmesocolic approach had a higher incidence of internal hernia than antecolic (1.3% vs.0.3%, $p<0.01$ ). There were 2(10%) deaths in this series, these patients had SBO and were treated in non-bariatric centers. They were operated 3d after onset of symptoms presenting with small bowel necrosis and could not survive sepsis. All patients had Petersen's hernia in this series. There was a pregnant patient who developed SBO due to internal hernia at the sixth month of pregnancy and needed to be operated with uneventful recovery.

**Conclusion:** Internal hernia is a complication of GB that can lead to SBO and emergency surgery. High index of suspicion, referral to bariatric centers and suturing of all mesenteric defects in the primary bariatric procedure or on subsequent procedures is advised. Internal hernia seems to be more frequent in transmesocolic than antecolic approach.



Petersen's Hernia

**P-93.**

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### **GASTROJEJUNOSTOMY STENOSIS. CHANGING THE SUTURE REDUCES INCIDENCE - 175 PATIENT SERIES**

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**Background:** The Roux-en-Y Gastric Bypass is one of the gold-standards to treat morbid

obesity. One of its possible complications is the gastrojejunostomy (G-J) stenosis. Our aim is to evaluate a series of G-J stenosis endoscopic dilatations with Trough The Scope (TTS) balloons and its incidence after introducing a new suture on G-J.

**Methods:** Between December, 2001 and December, 2007, retrospective data on 3,818 patients submitted to lap gastric bypass (banded and non-banded) with a calibrated G-J to 11-12mm were analyzed to see the incidence of stenosis and the output of its treatment with endoscopic TTS balloons.

**Results:** From 2001 to 2004, the G-J stenosis rate was 8.26% using an Ethibond® extra-mucosal running suture. After introducing PDS® suture with the same surgical technique, the stenosis rate dropped to 2.68% ( $p < 0,001$ ), 2.16% and 1.6% in 2005, 2006 and 2007 respectively. In 175p (4.6% overall rate) dilated with TTS balloons, no perforations happened, 3 patients referred abdominal pain needing to be medicated without radiological signs of perforation.

**Conclusion:** The use of PDS® suture on gastrojejunostomy significantly reduces G-J stenosis. Endoscopic dilatations with TTS balloons is a safe and effective option on calibrated G-J stenosis with minimum complication rates and no perforation.