

Boon and Banes of Advanced Bariatric Surgery**Sandeep Rajan K, Tejaswi K, Vinod Kumar P and NL Durga Prasad**

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Abstract: Bariatric surgery is a convenient and sophisticated technique recently developed to treat obesity great than surgeries earlier. Obesity is the one that decrease the man's survival life. The updated sedentary life style makes us obese. As a result a lot of notorious diseases risk us to bear lots of problems. To avoid this, bariatric surgery now a day's rules the obesity out, facilitates to be free from dreadful diseases. Lots of difficulties, if proper care is not taken but lots of benefits, if followed properly. As a pharmacist it is our responsibility to boom up the present undertaking margin of success of surgery. Also wants to give a challenge that to develop a dosage form to burn up the fats without surgery to minimize the risks of complications has been acquired during surgery. Bariatric surgery acts like a single shot for 100 birds as it vanishes many diseases with a single surgery.

Keywords: Bariatric Surgery, Obesity, Gastrectomy, Weight Loss.

Introduction

Bariatric surgery is a sophisticated weight loss surgery to the people who are obese¹. It includes different surgical methods, which is advantageous than the weight loss surgeries so far done. Weight loss is achieved by reducing the size of the stomach with a gastric band or through removal of a portion of the stomach (sleeve gastrectomy or biliopancreatic diversion with duodenal switch) or by resecting and re-routing the small intestines to a small stomach pouch (gastric bypass surgery)². Obesity Surgery is a weight loss surgery for excessively obese patients having a high BMI³. The objective of obesity surgery is to restrict food intake resulting in reduced calorie intake and reduced storage of fat cells all leading to weight loss⁴. This surgery is recommended to patients suffering from morbid obesity and is performed when other means of weight reduction seem to have stopped working. Morbid Obesity refers to a condition where the extent of body weight poses / causes grave health risks. All Obesity Surgeries are subcategories of Bariatric Surgery.

Criteria for Obesity Surgery: Asian Standard:

1. Body Mass Index (BMI) of 37.5 or above (i.e. body weight being more than 40kg) without obesity related disorder.
2. BMI of 32.5 or above, with obesity related problem.

Patients who are obese but do not have a high BMI and are not morbidly obese can consider Liposuction or Tummy Tuck or both for fat removal and consequential inch loss and weight loss.

Care taken before surgery:

Before gastric bypass surgery, you need to schedule your initial visit to clinic. You will then be scheduled for several preoperative visits during the months before surgery.

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1. Food diaries

At the first visit and subsequent visits, patients are given food diaries to complete. We will not operate on patients who do not bring in their food diaries as assigned⁵. Honest and complete food diaries are necessary before surgery to ensure long-term dietary changes and portion control. Please follow our recommended dietary and lifestyle changes before surgery this makes the transition after surgery much easier.

2. Weight loss

For many patients, the best way to improve their health before surgery is to achieve some weight loss. This is especially true in patients with central (abdominal) obesity, sleep apnea, heart disease, and other life-threatening health problems⁶. Between the initial visit and preoperative visits, patients must be careful not to gain any weight, and some patients may need to lose weight. It improves patient's health and breathing.

3. Quit smoking

It is very important that patients quit smoking prior to surgery – the sooner, the better. Health and helps decrease the risks of life-threatening complications Smoking can increase the risk of dying, blood clots, pneumonia⁷.

4. Sleep study evaluation

Sleep apnea is a life-threatening condition that is often undiagnosed. Many patients being evaluated for bariatric surgery are already being treated for sleep apnea and do not have to repeat a sleep study⁸. If your score on the Epworth sleep scale is high, then we will help you schedule and set up the sleep study exam.

5. Cardiac evaluation

Obesity, high blood pressure, diabetes, and high cholesterol are all risk factors for heart disease. All patients will need an electrocardiogram (EKG) before surgery⁹. Echocardiogram and Cardiac catheterization. Coronary artery stent placement and Coronary artery bypass surgery.

6. Pulmonary evaluation

A number of patients will need to have a pulmonary evaluation before surgery, to determine if lung function is adequate. This can include pulmonary function tests, a visit to a pulmonologist¹⁰.

7. Primary care physician (PCP) visits/history and physical exam/screening studies

We recommend that patients schedule an appointment with their PCP to obtain a full history and have a complete physical exam. Patients with weight problems are at high risk for numerous life-threatening health problems

8. Upper GI-ray series

Patients that have had previous stomach surgery (weight-loss surgery) will need this to be evaluated¹¹.

9. Upper endoscopy

Patients who have had previous stomach surgery (weight-loss surgery) will need to undergo this evaluation¹². Also, patients being evaluated for Lap-Band will need this

10. Hematology consults

Patients with a history of blood disorders or blood clots may need to be evaluated by a hematologist. Blood tests are required by most insurance companies to evaluate for Helicobacter pylori (*H. pylori*) – bacteria that cause stomach ulcers¹³. Thyroid stimulating hormone (TSH) – to test for hypothyroidism.

Procedures of bariatric Surgery

Surgical Procedures:

Surgery may promote weight loss by several mechanisms, including the following:

- Restriction: decreasing food intake
- Malabsorption: causing food to be poorly digested and absorbed
- Hormonal changes: decreasing chemical signals that control hunger, or improving chemical signals that contribute to type 2 diabetes mellitus and metabolism.

Laparoscopic Roux-en-Y Gastric Bypass

- We presently consider the laparoscopic Roux-en-Y (pronounced “roo on why”) gastric bypass to be the best operation for the treatment of morbid obesity.

➤ The Roux-en-Y gastric bypass combines restriction, mild malabsorption, and hormonal changes to optimize both weight loss and improve health problems. Open gastric bypass was developed in 1967 and therefore has a long, proven success record (>43 years)¹⁴. The laparoscopic surgical approach provides the benefits of less pain and discomfort and quicker recovery. Fig(1)

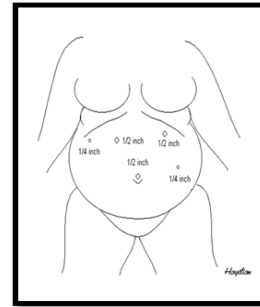
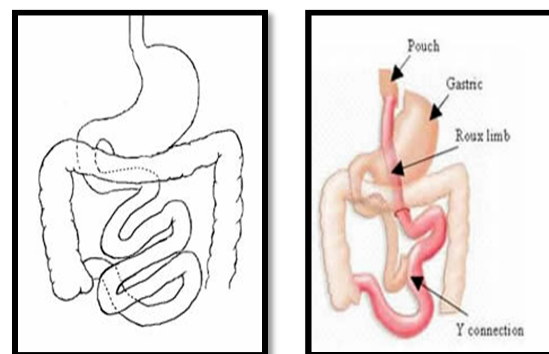


Fig.1: Morbid obesity

Laparoscopic Roux-en-Y gastric bypass surgery:

Laparoscopic Roux-en-Y gastric bypass surgery usually takes 1 to 2 hours and is performed under general anesthesia, meaning you are fully asleep. A needle is inserted into your abdomen and gas is pumped into your abdomen. A telescope camera is then inserted through a small incision near your belly button. In this procedure, stapling creates a small stomach pouch. The remainder of the stomach is not removed, but is completely stapled closed and cut away from the stomach pouch. The other end of the small intestine is connected to the side of the Roux limb of the intestine creating the “Y” shape that gives the technique its name¹⁵. Food passes into the small stomach pouch, then into the first 3-5 feet of intestine where very little is absorbed. The food then passes through the “Y” area where the other portion of stomach and small intestine join. It is here where more digestion begins. The bypassed portion of stomach, or “gastric remnant,” is still active and produces acid and digestive juices, although no food passes through it. Fig (2)



Normal anatomy After LRYG surgery
Fig.2: Laparoscopic Roux-en-Y gastric bypass

Laparoscopic Adjustable Gastric Banding

Laparoscopic adjustable gastric banding is considered the safest, least invasive, and only adjustable surgical treatment for morbid obesity. This procedure involves placing an inflatable silicone band into the patient's abdomen¹⁶. Like a wristwatch, the band is fastened around the upper stomach to create a new, tiny stomach pouch that limits and controls the amount of food eaten. It also creates a small outlet that slows the emptying process into the stomach and the intestines. As a result, patients experience an earlier sensation of fullness and are satisfied with smaller amounts of food. In turn, this hopefully will result in weight loss. Fig (3)



Fig.3: Laparoscopic banding

Vertical Banded Gastroplasty (VBG)

Vertical banded gastroplasty (VBG) is a "stomach stapling and banding" procedure that was performed in the past. However, this procedure has essentially been abandoned in favour of other operations.¹⁷ Although early weight loss results after VBG were reported to be about 60%, long-term failure rates are 50% to 80% - meaning that over the long term, more than half of patients regain their weight or develop complications. Fig (4)



Fig 4. Vertical gastroplasty

Biliopancreatic Diversion (BPD) and Biliopancreatic Diversion with "Duodenal Switch":

The biliopancreatic diversion and biliopancreatic diversion with "duodenal switch" operations produce weight loss primarily by causing mal absorption, although they do have a mild restrictive component. Weight loss with these more complicated surgeries is excellent (70% to 80% excess weight loss long-term), but patients must be very careful to strictly comply with taking vitamins

and eating enough protein to avoid severe malnutrition. Replacement of fat-soluble vitamins is mandatory for patients who have undergone one of these procedures. We presently do not perform this procedure¹⁸.

Jejunum-Ileal Bypass:

Jejunum-ileal bypass surgery was the first weight-loss surgery performed, in the 1970s and early 1980s, but it is no longer performed. Although this surgery resulted in good weight loss, many problems and complications (liver disease, kidney disease, electrolyte abnormalities, severe diarrhea and bacteria overgrowth in the bowel) developed. Patients who have had this surgery are usually advised to have it revised 'back' to normal gastrointestinal tract anatomy or to a gastric bypass procedure¹⁹.

Revisions of vertical-banded gastroplasty (VBG) to Roux-en Y gastric bypass (RYGB):

Vertical banded gastroplasty (VBG) is referred to by many patients as 'stomach stapling.'. It has been reported that after VBG, up to 80% of patients have poor long-term (10 year) results, including the following: Poor weight loss²⁰. High rate of blockage of the banded pouch. Tendency to adopt a high-calorie, sweet-liquid diet that leads to poor nutrition and regaining of weight. Fig (5).



Fig.5: Roux-en-Y type

Care should be taken after surgery:

Drink Plenty of Liquids:

After surgery, you should drink at least 2 liters of fluid each day. Patients lose weight very quickly after surgery, especially after gastric bypass²¹. Women typically lose about one pound a day within the first 2 weeks after gastric bypass.

Be Active:

It is important to keep active after surgery to avoid blood clots from forming in your legs. This means don't sit for a long period of time (>2 hours). On any long car or airplane rides, get up and walk around every hour or two. People typically go back to work 10 days to 2 weeks after surgery, but some people go back sooner.

Multivitamins:

Start taking one chewable multivitamin/mineral supplements twice a day

(bypass) or once a day (band) while on liquids (Phase 1 diet).²²When you progress to Phase 2 (soft foods), take your supplement with meals.

We recommend one of the following:

- Bariatric Advantage Chewable and Celebrate Vitamins chewable.

Calcium Supplement:

There is typically only a small amount of calcium in multivitamins. Therefore, we recommend taking an additional 1000mg-1500mg of calcium everyday when you progress to soft foods²³. There are different forms of calcium such as calcium carbonate and calcium citrate. Calcium citrate is the most efficiently absorbed form of calcium following gastric bypass.

- Bariatric Advantage Calcium Citrate Chewy Bites (2 chews 2 times per day)
- Bariatric Advantage Calcium Citrate Lozenges (one lozenge 2 times per day)

IRON Supplement:

We recommend that you take an iron supplement daily when you progress to soft foods, in addition to the iron in your multivitamin. Nausea and constipation are common side effects of iron supplementation. Listed below are some specific products we recommend. Take your iron supplement once a day with food²⁴.

- Bariatric Advantage Chewable Iron and Celebrate Vitamins Chewable Iron.

Vitamin B12:

Vitamin B12 is digested and absorbed differently than most vitamins. After gastric bypass surgery, you will no longer be able to digest and absorb sufficient amounts of B12 to maintain health²⁵. You must take your B12 in a form that directly enters the bloodstream, not through the digestive tract. Tabs like below are used.

- Sublingual B12 Micro lozenges,
- B12 drops 1000 mcg and B12 5000 Zipmelts.
- Bariatric Advantage Sublingual B12 with Folate.

Vitamin D:

In addition to the amount of vitamin D found in your multivitamin and calcium supplement begin taking 1000 IU of a supplemental vitamin D (cholecalciferol) a day.

- Bariatric Advantage Dry Vitamin D3 (take one dose per week)
- Bariatric Advantage Liquid Vitamin D3 (take one dose every two weeks)
- GNC Vitamin D3 1000 IU (take daily)

Risks of bariatric surgery:

Nausea and Vomiting

Patients may have a few episodes of nausea, vomiting and abdominal discomfort after surgery. This usually occurs in the first 2 or 3 months after surgery, as patients are getting used to their new diet and eating habits.

Dehydration:

It is important to drink about 2 liters of liquid a day during the first few months of rapid weight loss after gastric bypass surgery. Drinking this much fluid can be difficult during the first few weeks after surgery²⁶. However, dehydration can lead to nausea and persistent vomiting. Also, persistent vomiting can lead to dehydration and electrolyte imbalance.

Food Intolerance:

Patients may be intolerant to some foods after gastric bypass surgery. Eating smaller portions, eating more slowly, chewing foods well and avoiding high-sugar foods can resolve problems²⁶.

Dumping Syndrome:

A condition known as "dumping syndrome" can occur as the result of rapid emptying (dumping) of stomach contents into the small intestine. This is triggered when too much sugar or very greasy (fried) foods are consumed²⁷.

Changed Bowel Habits:

After gastric bypass surgery, patients may have smaller and fewer bowel movements and constipation is quite common. This is especially true in women and when guidelines are followed for iron supplementation²⁸.

Transient Hair Thinning:

About half of women who have undergone gastric bypass surgery notice thinning of their hair. This usually occurs between months 2 and 10 after surgery²⁹. Thinning may be minimized by maintaining adequate protein intake, taking daily multivitamins, and possibly by addition of zinc and biotin supplements.

Pregnancy:

Many obese women have trouble with fertility and regular menstrual cycles. As weight loss occurs, this situation may change quickly. Women get more regular periods and can become more fertile with weight loss³⁰.

Benefits of bariatric surgery:

Weight Loss after Roux-en-Y Gastric Bypass Surgery:

Most patients lose between 60% and 85% of their excess body weight at by 1 year after gastric bypass surgery. About 9 out of 10 patients will lose

more than 50% (half) of the excess weight by the end of the first year after gastric bypass surgery³¹. About 1 out of 10 patients will lose less than 50% of the excess weight, although those who lose less still have improvement in weight-related health problems such as diabetes and high blood pressure. Graph explains weight loss of 800 first bariatric surgery patients in a health care survey Fig (6).

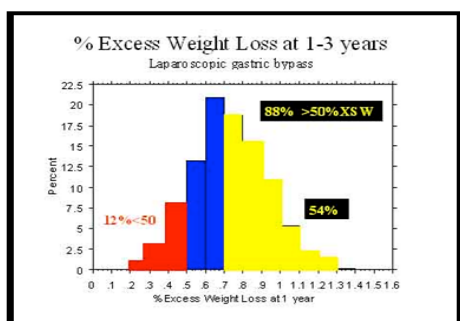


Fig.6: graph of first 800 patients in a hospital survey

Weight Loss after Adjustable Band:

Weight loss results after adjustable banding are very variable. Most patients lose between 25% and 60% of their excess body weight at by 1 to 3 years after adjustable band surgery. The average excess weight loss is typically about 40%³².

High Blood Pressure:

Hypertension (high blood pressure) improves in most patients after gastric bypass surgery, often within a few days after surgery³³. Hypertension resolves completely in about 75% of patients and is improved in an additional 10%. Some patients may still need medical treatment of their high blood pressure, but with fewer medications than before surgery or at lower doses.

High Cholesterol and Triglyceride Levels:

About 80% of patients who have high cholesterol or triglyceride levels will have normal cholesterol and triglyceride levels within a few months after gastric bypass surgery.

Diabetes Mellitus:

Hormonal (body chemistry) changes occur soon after gastric bypass surgery that leads to improve blood sugar control in diabetic patients. Remission of type 2 diabetes mellitus occurs in about 85% of patients who have undergone gastric bypass surgery³⁴. Most patients are able to completely discontinue their diabetic medications soon after gastric bypass surgery. Patients who still need medications (including insulin) to control diabetes after gastric bypass surgery find they are able to gain better control of their blood sugars with smaller doses.

Heart Disease:

Gastric bypass surgery leads to improvements in the major risk factors for heart disease: high blood pressure, diabetes, and high cholesterol. Also, weight loss can lead to improvement in cardiac function, because with less weight, the heart does not have to work as hard³⁵.

Respiratory Insufficiency:

Patients usually feel an improvement in tolerance for exercise and easier breathing within the first few months after gastric bypass surgery. Often patients who have been able to walk find that they are able to participate in sports³⁶.

Sleep Apnea Syndrome:

Most patients stop snoring within a few months after weight-loss surgery. More than 85% of patients who had to use continuous positive airway pressure machines at night before surgery are symptom-free without their machines at one year after surgery³⁷.

Asthma:

Most patients who had asthma before weight-loss surgery find that they have fewer and less severe attacks, or sometimes none at all, as they lose excess weight and fat³⁸.

Gastro esophageal Reflux Disease:

Relief of heartburn due to gastro esophageal reflux disease occurs soon after surgery in more than 90% of patients³⁹.

Stress Urinary Incontinence:

Stress urinary incontinence usually becomes completely controlled without medication as women lose abdominal fat and the pressure of fat on the bladder decreases⁴⁰.

Quality of Life:

Patients find that they have overall better quality of life after surgery: meeting the challenges (social, emotional and psychological) that they faced before surgery becomes easier⁴¹. Patients begin to feel confident in facing certain public issues and better about themselves and their self-esteem improves. Many patients feel they have a "new lease on life". Patients can participate in activities with their families, such as going on amusement park rides, and enjoy everyday activities⁴². Most patients notice improved levels of energy due to their weight loss. They feel they are no longer "carrying around an extra person".

Conclusion

An important way in which our article seeks to improve care for our weight-loss surgery patients is to conduct research and share our results with other healthcare professionals. All the pharma innovators

has to develop vigorous research in developing medicine to improvise the standard of living by decreasing the cholesterol levels⁴³.

References

1. Sjöström L, Peltonen M, Jacobson P, Sjöström CD, Karason K, Wedel H, et al. Bariatric surgery and long-term cardio vascular events. *JAMA*. Jan 4, 2012; 307(1): 56-65.
2. MacLean LD, Rhode BM, Nohr CW. Late outcome of isolated gastric bypass. *Ann Surg*. Apr 2000; 231(4): 524-8.
3. Wittgrove AC, Clark GW, Tremblay LJ. Laparoscopic Gastric Bypass, Roux-en-Y: Preliminary Report of Five Cases. *Obes Surg*. Nov 1994; 4(4): 353-357.
4. Higa KD, Ho T, Boone KB. Laparoscopic Roux-en-Y gastric bypass: technique and 3-year follow-up. *J Laparoendosc Adv Surg Tech A*. Dec 2001; 11 (6): 377-82.
5. Regan JP, Inabnet WB, Gagner M, et al. Early experience with two-stage laparoscopic Roux-en-Y gastric bypass as an alternative in the super-super obese patient. *Obes Surg*. Dec 2003; 13 (6): 861-4.
6. Daniel J. Gagné MD, Elizabeth Dovec MD, Jorge Urbandt MD. Surgery for Obesity and Related Diseases Laparoscopic revision of vertical banded gastroplasty (VBG) to Roux-en-Y gastric bypass - outcomes of 105 patients. 2010.
7. Cottam D, Qureshi FG, Mattar SG, Sharma S, Holover S, Bonanomi G. Laparoscopic sleeve gastrectomy as an initial weight-loss procedure for high-risk patients with morbid obesity. *Surg Endosc*. Jun 2006; 20(6): 859-63.
8. Plecka Östlund M, Wenger U, Mattsson F, Ebrahim F, Botha A, Lagergren J. Population-based study of the need for cholecystectomy after obesity surgery. *Br J Surg*. Mar 7 2012.
9. Lidar Z, Behrbalk E, Regev GJ, Salame K, Keynan O, Schweiger C, et al. Intervertebral Disc Height Changes after Weight Reduction in Morbid Obese Patients, its Effect on Life Quality, Radicular and Low Back Pain. *Spine (Phila Pa 1976)*. May 29 2012.
10. Keating CL, Dixon JB, Moodie ML, et al. Cost-effectiveness of surgically induced weight loss for the management of type 2 diabetes: modeled lifetime analysis. *Diabetes Care*. Apr 2009; 32 (4): 567-74.
11. Balsiger BM, Murr MM, Poggio JL, Sarr MG. Bariatric surgery. Surgery for weight control in patients with morbid obesity. *Med Clin North Am*. Mar 2000; 84 (2): 477-89.
12. Belachew M, Legrand M, Vincent V, Lismonde M, Le Docte N, Deschamps V. Laparoscopic adjustable gastric banding. *World J Surg*. Sep 1998; 22 (9): 955-63.
13. Podnos YD, Jimenez JC, Wilson SE, Stevens CM, Nguyen NT. Complications after laparoscopic gastric bypass: a review of 3464 cases. *Arch Surg*. Sep 2003; 138 (9): 957-61.
14. Saber AA. Gastric pacing: a new modality for the treatment of morbid obesity. *J Invest Surg*. Mar-Apr 2004; 17(2): 57-9.
15. Saber AA, Boros MJ, Mancl T, et al. The effect of laparoscopic Roux-en-Y gastric bypass on fibromyalgia. *Obes Surg*. Apr 8 2008.
16. Saber AA, El-Ghazaly TH. Early experience with single incision transumbilical laparoscopic adjustable gastric banding using the SILS Port. *Int J Surg*. Oct 2009; 7(5): 456-9.
17. Saber AA, El-Ghazaly TH. Early experience with single-access transumbilical adjustable laparoscopic gastric banding. *Obes Surg*. Oct 2009; 19 (10): 1442-6.
18. Saber AA, Elgamal MH, McLeod MK. Bariatric surgery: the past, present, and future. *Obes Surg*. Jan 2008; 18 (1): 121-8.
19. Saber AA, Scharf KR, Turk AZ, Elgamal MH, Martinez RL. Early Experience with Intraluminal Reinforcement of Stapled Gastrojejunostomy During Laparoscopic Roux-En-Y Gastric Bypass. *Obes Surg*. Mar 7 2008.
20. Schauer PR, Ikramuddin S, Gourash W, Ramanathan R, Luketich J. Outcomes after laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Ann Surg*. Oct 2000; 232 (4): 515-29.
21. Daniel J. Gagné MD, Natasha St. Germaine MD, Jorge Urbandt MD. Laparoscopic revision of Roux-en-Y gastric bypass for dysphagia and bile reflux. *Surgery for Obesity and Related Diseases* 2010; 6; 551-3.
22. Gagné DJ. Laparoscopic Revision of Vertical Banded Gastroplasty (VBG) to Roux-en-Y Gastric Bypass. *Principles and Practice*, edited by Pitombo C, Jones K, Higa K, Pareja JC; McGraw-Hill, NY: 2008.
23. Gagné DJ, Pappas PK, Maalouf M, Urbandt JE, Caushaj PF. Laparoscopic Bariatric Surgery and Malignancy: Our experience after 1500 cases. *Surgery for Obesity and Related Diseases* 2008 Aug 5.
24. Davis G, Patel JA, Gagné D. Pulmonary considerations in obesity and the bariatric surgical patient. *Medical Clinics of North America*. May 2007; 433-442.
25. Gagné DJ; DeVoogd K; Rutkoski JD; Pappas PP; Urbandt JE. Laparoscopic repair of internal hernia during pregnancy after Roux-en-Y gastric bypass. *Surgery for Obesity and Related Diseases*, 2009.
26. Pappas PK, Yeane WW, Caushaj PF, Keenan RJ, Landreneau RJ, Gagné DJ. Perforation in the bypassed stomach following laparoscopic Roux-en-Y gastric bypass. *Obes Surg* 2003; 13(5): 797-9.

27. Papasavas PK, Caushaj PF, McCormick JT, Quinlin RF, Paige J, Hayetian FD, Maurer J, Kelly JJ, Gagné DJ. Laparoscopic management of complications following laparoscopic Roux-en-Y-gastric bypass formorbid obesity. *Surg Endosc* 2003 Apr; 17(4): 610-4.
28. McCormick JT, Papasavas PK, Caushaj PF, Gagné D. Laparoscopic revision of failed open bariatric procedures. *Surg Endosc* 2003 Mar; 17(3): 413-5.
29. American Society for Metabolic and Bariatric Surgery - Statements, Guidelines, Action Items. Available at http://www.asmb.org/Newsite07/resources/asmb_ms.htm. Accessed 5/24/2009.
30. Rutkoski JD, Gagné DJ, Papasavas PP, Urbandt JE. Development of Symptomatic Hiatal Hernia after Weight Loss from Laparoscopic Roux-en Y Gastric Bypass Surgery for Obesity and Related Diseases 2009.
31. Rutkoski J, Gagné DJ, Volpe C, Papasavas PK, Caushaj PF. Pancreaticoduodenectomy for pancreatic cancer after laparoscopic Roux-en Y gastric bypass Surgery for Obesity and Related Diseases 2008; 4;(552-4;discussion 554-4).
32. Ceppa FA, Gagné DJ, Papasavas PK, Caushaj PF. Laparoscopic transgastric endoscopy after Roux-en-Y gastric bypass. *Surgery for Obesity and Related Diseases* 2007 Jan-Feb; 3 (1):21
33. Gagné DJ, Papasavas PK, Birdas T, Lamb J, Caushaj PF. Gastro pericardial fistula after gastric bypass for morbid obesity. *Surgery for Obesity and Related Diseases* 2006; 2; 533–535.
34. Goitein D, Papasavas P, Gagné D, Urbandt J, Caushaj P. Laparoscopic resection of gastric diverticulum presenting after Roux-en-Y gastric bypass. *Surgery for Obesity and Related Diseases* 2006; 2; 528–530.
35. Papasavas PK, Gagne DJ, Ceppa F, Caushaj PF. Routine gallbladder screening is not necessary in patients undergoing laparoscopic Roux-en-Y gastric bypass. *Surgery for Obesity and Related Diseases* 2006; 2:41-46.
36. Goitein D, Gagné DJ, Papasavas PK, McLean G, Foster RG, Beasley HS, Caushaj PF. Percutaneous CT-guided gastric remnant access after laparoscopic Roux-en-Y gastric bypass. *Surg Obes Relat Dis* 2006 Nov-Dec; 2(6): 651-5.
37. Gagné DJ. Laparoscopic revision of Vertical Banded Gastroplasty to Roux-en-Y Gastric Bypass. American College of Surgeons Video Library, October 2006.
38. Goitein D, Papasavas PK, Gagne DJ, Caushaj PF. Late Perforation of the Jejuno-Jejunal Anastomosis after Laparoscopic Roux-en-Y Gastric Bypass. *Obes Surg* 2005 Jun; 15(6): 880-2.
39. Goitein D, Papasavas PK, Gagné D, Ahmad S, Caushaj PF. Gastrojejunal strictures following laparoscopic Roux-en-Y gastric bypass for morbid obesity *SurgEndosc* 2005 May; 19(5): 628-32. Epub 2005 Mar 11.
40. Papasavas PK, Gagné DJ, Kelly J, Caushaj PF. Laparoscopic Roux-en-Y gastric bypass is a safe and effective operation for the treatment of morbid obesity in patients older than 55 years. *Obesity Surgery* 2004 Sep; 14(8): 1056-61.
41. Goitein D, Gagné D, Papasavas P, Dallal R, Quebbemann B, Eichinger J, Johnston D, Caushaj P. Superior mesenteric artery syndrome after laparoscopic Roux-en-Y gastric bypass for morbid obesity *Obesity Surgery* 2004 Aug; 14(7): 1008-11.
42. Raftopoulos Y, Gagné DJ, Papasavas P, Hayetian F, Maurer J, Bononi P, Caushaj PF. Improvement of hypothyroidism after laparoscopic Roux-en-Y gastric bypass. *Obes Surg* 2004 Apr; 14(4): 509-13.

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