Original Article

Gastric bypass is safe and effective for the super-super-obese patient

Vadim Meytes, Grace C. Chang, Mazen Iskandar, George Ferzli

NYU Lutheran Medical Center, Brooklyn, NY, USA

Contributions: (I) Conception and design: All authors; (II) Administrative support: None; (III) Provision of study materials or patients: None; (IV) Collection and assembly of data: V Meytes, GC Chang, M Iskandar; (V) Data analysis and interpretation: V Meytes, GC Chang, M Iskandar; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

Correspondence to: Vadim Meytes. 150 55th Street, Brooklyn, NY 718-630-7351, USA. Email: Vadim.meytes@nyumc.org.

Background: Obesity in the United States is on the rise with a growing percentage of patients being diagnosed as super-super-obese (SSO) defined as patients with a body mass index (BMI) ≥60 kg/m². This patient population is at high risk of mortality due to associated comorbidities. In patients with BMI ≤49 kg/m², the Roux en-Y gastric bypass (RYGB) is considered the 'gold standard' surgical treatment for BMI reduction. However, there are limited studies to extrapolate that into SSO patients and some surgeons advocate for a staged approach. The goal of this study is to analyze the safety and efficacy of RYGB surgery in the SSO population.

Methods: Between September 2004 to April 2015, 78 SSO patients underwent RYGB surgery at NYU Lutheran Medical Center. A retrospective study was performed to analyze reduction of preoperative comorbidities, postoperative outcomes and complications, total percentage of excess weight loss (%EWL) and patient follow up.

Results: Thirty six patients were males and 42 were females with a mean age of 37±10. The mean BMI was 65±4.8 kg/m² and 12 (15.3%) had a BMI ≥70 kg/m². The average OR time was 123±50 minutes, estimated blood loss (EBL) was 10±7.9 mL, and the average length of stay was 75±38 hours. None of the patients were converted to open surgery and 66 (83.5%) had no postoperative complications. For patients with complications, all were Clavien-Dindo grade 1–2 and did not require any invasive interventions. Of the 46 patients who followed up within 6 months, 45 (98.7%) had a decrease in %EWL with an average of 26%±14%. Thirty six (78.3%) of these follow up patients had preoperative comorbidities and 15 (41.7%) had significant improvement or even complete resolution post-surgery.

Conclusions: In our experience, the RYGB is a safe and effective single stage surgical treatment for SSO patients. These patients start to achieve a significant BMI reduction as well as improvement or resolution of their comorbidities without significantly high complication rate however, longer follow up is needed. Follow up in general within this patient population is a nationwide problem and is something that needs to be more consistent in order to better track the postoperative course of the SSO patient.

Keywords: Super-super-obese (SSO); Roux en-Y gastric bypass (RYGB); bariatric surgery

Received: 23 January 2017; Accepted: 21 February 2017; Published: 08 March 2017.

doi: 10.21037/ales.2017.02.27

View this article at: http://dx.doi.org/10.21037/ales.2017.02.27

Introduction

Obesity in the United States is on the rise with recent literature stating that 35% of men and over 40% of women are obese (1). Even more startling is the growing percentage of obese patients being diagnosed as Super-super-obese (SSO) which is defined as patients with a body mass index (BMI) ≥60 kg/m². These alarming rates are even more reason to determine safe and sustainable methods for SSO

to reduce BMI and life-threatening medical conditions.

As the degree of obesity becomes more severe, there may be a higher risk for obesity-related mortality due to associated comorbidities. The SSO population is at an especially high risk of mortality due to comorbidities which include hypertension, coronary heart disease, stroke, adult onset diabetes, asthma, osteoarthritis, venous stasis disease, pregnancy complications, gastroesophageal reflux disease (GERD), chronic headaches, obstructive sleep apnea, liver disease, lower back pain and urinary incontinence (2). While these comorbidities may not all be caused directly by physically being obese and may be due to metabolic changes in the body, these comorbidities may be detrimental to the patient's overall health and quality of life (3).

For the SSO, bariatric surgery is considered the most effective method to increase weight loss (4). In the United States, laparoscopic adjustable gastric band, gastric sleeve surgery, Roux en-Y gastric bypass (RYGB), and biliopancreatic diversion with duodenal switch are used for bariatric surgeries. Though the number of gastric sleeve surgery performed in the United States has recently surpassed RYGB, in patients with BMI ≤49 kg/m² worldwide, the RYGB is considered the 'gold standard' surgical treatment for BMI reduction. However, there are limited studies to extrapolate that into SSO patients. Studies on safety and effectiveness of bariatric surgery have been focused on morbidly obese (MO) and super obese (SO) patients which are defined as BMI ≥40 kg/m² and BMI ≥50 kg/m², respectively.

While there can be a higher risk for surgical intervention for SSO patients due to the complexity and need for more experienced surgeons, studies that have been performed have shown that bariatric surgery is safe and effective for SSO patients (5). Some surgeons advocate for a staged approach. The focus for surgeons doing bariatric surgery is to eliminate obesity related morbidity and achieve ideal body weight. The goal of this study is to analyze the safety and efficacy of RYGB surgery in the SSO population.

Methods

Between September 2004 and April 2015, a total of 78 SSO patients underwent RYGB surgery at NYU Lutheran Medical Center in Brooklyn, New York, USA. A retrospective study was performed to analyze a variety of parameters that may influence the success of the surgery. These parameters include patient demographics, length of surgery, duration of postoperative hospital stay, reduction of preoperative comorbidities, postoperative outcomes and complications, total percentage of excess weight loss (%EWL) and patient follow-up. Success in surgical intervention was defined as reduction of at least 25% EWL, and/or reduction or resolution in preoperative comorbidities. Adverse events such as intra-operative and post-operative complications as well as hospital re-admissions were tracked and recorded.

Operative technique

All RYGB were performed at NYU Lutheran Medical Center by surgeons with advanced laparoscopic training. While each case had slight degrees of variation due to patient factors, the same general technique was utilized. The SSO patient is brought to the operating room and placed in a supine position. Sequential stockings are placed and the abdomen is prepped and draped in the usual manner. A Veress needle is inserted in the umbilicus and pneumoperitoneum is established to a pressure of 15. One-third below the xiphoid to the left of the midline, a 10 mm trocar is introduced and laparoscopy carried out. Under direct visualization, five other trocars are placed; 5 and 12 mm in the left upper quadrant, 5 mm subxiphoid for left lobe of liver retraction, and 5 and 12 mm in the right upper quadrant. Dissection is started by reflecting the omentum cephalad, clearly visualizing the transverse colon, transverse mesocolon, and ligament of Treitz. The small bowel is then divided with an Endo GIA stapler 150 cm distal to the ligament of Treitz, and 150 cm distal to that, a side-to-side anastomosis is done with a second Endo GIA. The jejuno-jejunostomy is the closed with an interrupted figure-of-eight 2-0 silk intracorporeal free sutures. The opening trap in the mesentery is closed with interrupted figure-of-eight 2-0 silk intracorporeal free sutures as well. Attention is then paid to the stomach and the lesser SAC ISS entered, and a horizontal application of an Endo GIA stapler is done. After that, with a 32-French calibrating tube in place, using an Endo GIA reinforced with Peri-Strips, a longitudinal pouch is created. The small bowel is then brought up under no tension in an antecolic and antegastric fashion. The posterior layer of the Gastro-Jejunostomy is constructed to the gastric pouch with interrupted figure-of-eight 2-0 silk intracorporeal free sutures. The gastric pouch along with the small bowel is then opened to allow an easy passage of the calibrating tube, and the anterior layer is constructed with interrupted simple 2-0 silk sutures. The

anastomosis is then tested with 120 mL of methylene blue and under water to look for a leak.

Results

Demographics

Of the 78 SSO that underwent RYGB surgery, 36 patients were males (46%) and 42 were females (54%). The mean age of the patients was 37±10 years old. The mean BMI was 65±4.8 kg/m² and 12 (15.3%) had a BMI ≥70 kg/m² (*Table 1*). The average OR time was 123±50 minutes, estimated blood loss (EBL) was 10±7.9 mL, and the average length of stay was 75±38 hours. The number of mediations taken by our patient population preoperatively ranged from zero to fourteen.

Comorbidities

Sixty-two of the SSO patients presented with preoperative comorbidities that included osteoarthritis, GERD, hypertension, obstructive and non-obstructive sleep apnea, diabetes type 1 and 2, heart burn, rheumatoid arthritis, asthma, hypothyroidism, depression, a fibrillation, lymphedema, fibromyalgia, diverticulitis, B12 deficiency, iron deficiency, and chronic obstructive pulmonary disease. The remaining sixteen did not have any pre-or post-operative comorbidities reported. As seen in *Table 2*, total comorbidities reduced by forty-four percent. Hypertension, GERD, Osteoarthritis and diabetes type 2 were of the most common comorbidities reported in our patient population. Each category saw improved and/or resolved diseases with reductions equaling 23%, 44%, 32%, and 40%, respectively.

Table 1 Baseline patient demographics

Demographics	Outcome [range]
Sex, n (%)	
Male	36 (46.0)
Female	42 (54.0)
Mean age (y)	37 [18–62]
Mean weight (kg)	193 [133–356]
Mean BMI (kg/m^2)	65 [60–83]

BMI, body mass index.

Complications

None of the patients were converted to open surgery and 66 (83.5%) had no postoperative complications. For patients with complications, all were Clavien-Dindo grade 1–2. Complications included post-operative ileus, self-resolving anastomotic edema, incisional pain and dehydration. No complications required any invasive interventions.

EWL and follow-up

Patients were followed by medical providers and/or nutritionists during their follow-up visits at 6, 12 and 24 months (*Table 3*). Their weight, BMI, medications and comorbidities were reviewed at each follow-up. The mean weight at 6 months postoperative was 140±24 (kg). The mean weight at 12 months postoperative was 124±29 (kg). Of the 46 patients who followed up within 6 months, the %EWL was an average of 26%±14%. At 12-month follow up, 43 patients had an average of 34%±11% EWL. At 24-month follow up, 25 patients had an average of 36%±12% EWL.

Table 2 Comparison of patient comorbidities pre- and post-operative with postoperative percent reduction in comorbidities

Comorbidities	Preoperative	Post-operative (resolved/improved)	% reduction
With comorbidities	62	35	44%
Hypertension	30	23	23%
GERD	9	5	44%
Osteoarthritis	34	23	32%
Diabetes	15	9	40%

GERD, gastroesophageal reflux disease.

Table 3 Outcomes from patient follow up at months 6, 12 and 24: increase in percentage excess weight loss and reduction in obesity related comorbidities

Variables	Total Pts	Preoperative (kg)	Change in weight (kg)	Total %EWL	# Pts with comorbidities [%]	Change in comorbidities (resolved/improved) [%]
Preoperative	78	193±32.3			62 [79]	
6 months	46	186.4±33.9	47±12.7	25±6	37 [80]	22 [59]
12 months	43	424±71	66±25.8	34±11	35 [81]	16 [48]
24 months	25	424±71	74±26	36±12	18 [72]	10 [55]

Discussion

The laparoscopic RYGB is the most common weight reduction surgery performed worldwide (6). For SO and MO patients, surgeries such as laparoscopic adjustable gastric band and gastric sleeve surgery have been successful in weight reduction. Between 2008 and 2012, sleeve gastrectomy in the United States jumped from 0.9% of bariatric surgeries to 36.3% (7). However, RYGB surgery has been the choice of procedure for the SSO patient population that has the greatest effect. Due to the smaller number of SSO patients in the United States and worldwide, there are limited studies on the safety and effectiveness of RYGB surgery on this patient population. It has not been determined which surgery is most optimal for SSO patients. The purpose of this study is to assess the safety and efficacy of RYGB surgery for SSO patients.

The option of surgery has been controversial due to the size of SSO patients. A big concern has been whether providers can safely and effectively perform a RYGB on SSO patients. Some of the barriers to surgery include thicker visceral fat and abdominal walls which can decrease the surgeon's visualization and can contribute to surgeon's level of fatigue, possible increased length of operative time and a higher number of associated comorbidities (8). For these reasons, RYGP is not always the first line of treatment.

In our study, none of the patients who underwent RYGB surgery had complications during surgery. The average OR time for our patient population was 123 minutes which is less than reported OR times by other studies for SSO (90–335 min for SSO *vs.* 120–284 min for SO patients) (9-11). Hospital stay postoperatively was also not significantly longer than reported values from other studies (2 days for SO patients *vs.* 3 days for SSO patients) (9). Our patients remained in the hospital for as little as 37 hours, with the longest patient staying 113 hours. Decreased operation time may decrease chances of infection and operative complications. There were also no reports of readmissions due to complications stemming from the surgery or reports of discharge to chronic care facilities. The lack of complications intra and post-operatively provide evidence that RYGB surgery was safe for our SSO patients.

RYGB has been strongly favored over laparoscopic adjustable gastric banding because of higher degree of weight loss in obese patients (12). In past studies, data shows that RYGB can reduce excess weight by up to 66% one to two years after surgery. Patients can maintain weight reductions of 60% EWL five years and 50% ten years after surgery (13).

Some of the most commonly reported comorbidities in the SSO patients include obstructive sleep apnea, hypertension, GERD and adult onset diabetes. Although SSO patients tend to have a higher number of preoperative comorbidities, many studies reported similar decrease in these comorbidities postoperatively when comparing between SSO and SO patients. In our own patients, we found RYGB to be on par with previous data, seeing a significant reduction in comorbidities going from an average of 2±1 pre-operatively to 1±1.7 at 6-month follow up.

We recognize that in our present study, there are several limitations. Datasets are limited to those who did follow-up. Follow-up at 12 and 24 months decrease dramatically when compared to 6 months follow-up. Loss to long term follow up is a multifactorial phenomenon that is very common in bariatric surgery leading to an overall decrease in quality of bariatric studies. More than 40% of bariatric studies lack adequate long-term follow-up knowing that patients with adequate follow up have better results (14). There are also limited SSO bariatric surgery studies to compare

data to as there is a smaller percentage of patients who are considered SSO. Follow-up tended to be lacking in similar studies as well. In a recent study that included both gastric bypass and sleeve gastrectomy patients, bariatric surgery in the SSO population was found to be feasible with comparable EWL outcomes and postoperative complications to historical non-SSO patients (15). EWL of >30% was achieved in almost every patient at 1 year follow up. In our own SSO population was found %EWL to be 25±6, 34±11 and 36±12 at 6, 12, and 24 months respectively.

Overall, compared with other small studies on surgical outcomes of SSO patients, our results show considerable similarities with data presented. Although each SSO patient needs to be individually evaluated for comorbidities and risks prior to surgery, with an experienced surgeon and healthcare team as well as proper follow-up, RYGB surgery can be safe and effective method for significant weight reduction in SSO patients.

Conclusions

In our experience, the RYGB is a safe and effective single stage surgical treatment for SSO patients. These patients start to achieve a significant BMI reduction as well as improvement or resolution of their comorbidities without significantly high complication rate however, longer follow-up is needed. Follow-up in general within this patient population is a nationwide problem and is something that needs to be more consistent to better track the postoperative course of the SSO patient.

Acknowledgments

Funding: None.

Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/ales.2017.02.27). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This manuscript was submitted to the IRB committee and was deemed as not needing IRB approval as well as not needing informed consent due to this manuscript being a retrospective chart review.

References

1. Flegal KM, Kruszon-Moran D, Carroll MD, et al. Trends in Obesity Among Adults in the United States, 2005 to 2014. JAMA 2016;315:2284-91.
2. American Society of Metabolic & Bariatric Surgery. Obesity in America. ASMBS (published November 2013, accessed 21 January 2017). Available online: http://asmbs.org/wp/uploads/2014/06/Obesity-in-America-1.pdf
3. Mehaffey JH, LaPar DJ, Turrentine FE, et al. Outcomes of laparoscopic Roux-en-Y gastric bypass in super-super-obese patients. Surg Obes Relat Dis 2015;11:814-9.
4. Joshi GP, Ahmad S, Riad W, et al. Selection of obese patients undergoing ambulatory surgery: a systematic review of the literature. Anesth Analg 2013;117:1082-91.
5. Parikh MS, Shen R, Weiner M, et al. Laparoscopic bariatric surgery in super-obese patients (BMI>50) is safe and effective: a review of 332 patients. Obes Surg 2005;15:858-63.
6. Buchwald H, Oien DM. Metabolic/bariatric surgery worldwide 2011. Obes Surg 2013;23:427-36.
7. Nguyen NT, Nguyen B, Gebhart A, et al. Changes in the makeup of bariatric surgery: a national increase in use of laparoscopic sleeve gastrectomy. J Am Coll Surg 2013;216:252-7.
8. Zak Y, Petrusa E, Gee DW. Laparoscopic Roux-en-Y gastric bypass patients have an increased lifetime risk of repeat operations when compared to laparoscopic sleeve gastrectomy patients. Surg Endosc 2016;30:1833-8.
9. Stephens DJ, Saunders JK, Belsley S, et al. Short-term outcomes for super-super obese (BMI > or =60 kg/m2) patients undergoing weight loss surgery at a high-volume bariatric surgery center: laparoscopic adjustable gastric

banding, laparoscopic gastric bypass, and open tubular gastric bypass. Surg Obes Relat Dis 2008;4:408-15.
10. Madhok B, Mahawar KK, Boyle M, et al. Management of Super-super Obese Patients: Comparison Between Mini (One Anastomosis) Gastric Bypass and Sleeve Gastrectomy. Obes Surg 2016;26:1646-9.
11. Zerrweck C, Sepúlveda EM, Maydón HG, et al. Laparoscopic gastric bypass vs. sleeve gastrectomy in the super obese patient: early outcomes of an observational study. Obes Surg 2014;24:712-7.
12. Tice JA, Karliner L, Walsh J, et al. Gastric banding or bypass? A systematic review comparing the two most popular bariatric procedures. Am J Med 2008;121:885-93.
13. Sugerman HJ. Bariatric surgery for severe obesity. J Assoc Acad Minor Phys 2001;12:129-36.
14. Switzer NJ, Merani S, Skubleny D, et al. Quality of Follow-up: Systematic Review of the Research in Bariatric Surgery. Ann Surg 2016;263:875-80.
15. Serrano OK, Tannebaum JE, Cumella L, et al. Weight loss outcomes and complications from bariatric surgery in the super super obese. Surg Endosc 2016;30:2505-11.

doi: 10.21037/ales.2017.02.27
Cite this article as: Meytes V, Chang GC, Iskandar M, Ferzli G. Gastric bypass is safe and effective for the super-super-obese patient. Ann Laparosc Endosc Surg 2017;2:38.

