Laparoscopic Roux-en-Y Gastric Bypass in the "Megaobese".

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ORIGINAL ARTICLE

Laparoscopic Roux-en-Y Gastric Bypass in the "Megaobese"

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Hypothesis: Laparoscopic Roux-en-Y gastric bypass is a safe and effective procedure in patients with a body mass index (BMI; calculated as weight in kilograms divided by the square of height in meters) of 70 or greater.

Design: A retrospective analysis of patients with a BMI of 70 or greater who underwent laparoscopic Roux-en-Y gastric bypass by a single surgeon.

Setting: A university-affiliated community hospital in Allentown, Pa.

Patients: A nonconsecutive series of 9 patients with a BMI of 70 or greater who met traditional criteria for a bariatric procedure.

Intervention: Laparoscopic approach to Roux-en-Y gastric bypass with stapled anastomoses.

Results: Patient medical records were reviewed for length of stay, complications, operative time, comorbidities, and weight loss. Seven patients were women and 2 were men. Comorbidities included dyspnea on exertion, peripheral edema, arthritis, sleep apnea, hypertension, diabetes mellitus, asthma, hypothyroidism, gastroesophageal reflux disease, peptic ulcer disease, and heart disease. Eight of 9 procedures were successfully completed laparoscopically. One patient was converted to an open procedure. One patient developed a marginal ulcer postoperatively. No other complications occurred. Operative time ranged from 122 to 330 minutes (mean, 203 minutes). Length of stay averaged 1.2 days. Overall weight loss was 49% of excess body weight at 1 year after surgery.

Conclusion: Laparoscopic Roux-en-Y gastric bypass is safe and effective in patients with a BMI of 70 or greater.

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ROUX-EN-Y GASTRIC bypass (RYGB) is rapidly becoming the standard for bariatric surgery. Despite the increased technical difficulty and steep learning curve, laparoscopic RYGB is being performed more often and may eventually replace open RYGB as the surgery of choice. Morbid obesity is defined as being 100 lbs (45 kg) over the ideal body weight or having a body mass index (BMI; calculated as weight in kilograms divided by the square of height in meters) of greater than 40.[1] These individuals are generally considered suitable candidates for RYGB. The application of laparoscopic RYGB in patients with extremely elevated BMI is more controversial. The *superobese* have been defined as those with a BMI of greater than 50.[2] The population of patients with a BMI of greater than 60 has been described and termed the *suprasuperobese* or *massive obese*.[3] Published studies do not describe the population with BMIs of 70 or greater. This population we have termed "megaobese." We have reviewed our experience with this unique group of 9 patients in our series of 200 laparoscopic RYGB procedures.

See Invited Critique at end of article

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METHODS

We performed a retrospective analysis of all megaobese patients who underwent laparoscopic RYGB during a 15-month period. Candidates for RYGB were all required to have a history of a failed diet regimen. Preoperative evaluation was conducted in the office. Routine laboratory studies, chest radiographs, and electrocardiograms were obtained. Presurgery weights were taken and a preoperative BMI was calculated. Patients received a standard mechanical bowel preparation kit before surgery. Deep vein thrombosis prophylaxis was begun 2 hours before surgery with subcutaneous heparin sodium administration and lower extremity sequential compressive devices.

Surgery was performed by a single board-certified general surgeon (P.F.R.) with an extensive background in bariatric and laparoscopic surgery. A single tertiary referral center (a university-affiliated community hospital in Allentown, Pa) was the site for all procedures. All cases were assisted by residents of postgraduate years 3 through 5.

Patients were admitted the day of surgery. All cases were accomplished with our standard 5-port approach, except for 2 cases that required an extra port as described in the "Comment" section. Two 12-mm ports were placed. One was in the right upper quadrant for the linear stapler; the second was in the left midclavicular, subcostal region for the circular stapler. The second site is initially used for placement of a 5-mm port, but this is eventually changed to a 12-mm port after the circular stapler is used. Two additional 5-mm ports were used, and one 10-mm port for the 45° scope was placed in the left paramedian position, lateral to the umbilicus. All bowel was divided with the laparoscopic linear stapling device. A small gastric pouch of 10 to 15 cm^3 was fashioned by dividing the stomach with sequential firings of the linear stapling device. We measured a distance of 35 cm distal to the ligament of Treitz and there divided the small bowel to create the Roux limb. Then, to form a "long-limb" RYGB, a point 150 cm distal to the first small-bowel division was chosen for the side-to-side jejunojejunostomy. The "Y" anastomosis was created there by using the linear stapler. A window in the mesocolon was then formed, and the Roux limb was passed through it to the lesser sac. This created a retrocolic retrogastric anastomosis. The gastrojejunostomy was then made with a No. 21 circular end-to-end anastomosing stapler. This was facilitated with an esophagogastroduodenoscope to place the anvil via the mouth into the gastric pouch.[4] Patients were admitted for postoperative care to the surgical floor. An upper gastrointestinal study with diatrizoate meglumine oral contrast was obtained on postoperative day 1 before starting a diet, provided the patient's size was amenable to the test. Patients were discharged to home with dietary counseling after tolerating clear liquids, also on postoperative day 1. Postoperative weights were obtained during routine office visits.

RESULTS

All patients were calculated to have a BMI of 70 or greater (range, 70-85; mean, 73). Preoperative weight ranged from 400 to 552 lbs (180 to 248 kg) (mean, 441 lbs [198 kg]). Ages ranged from 35 to 53 years (mean, 44 years). Seven patients (78%) were women and 2 (22%) were men. Comorbidities included peripheral edema (9 patients [100%]), arthritis (7 [78%]), sleep apnea (7 [78%]), dyspnea on exertion (7 [67%]), hypertension (4 [44%]), diabetes mellitus (3 [33%]), asthma (2 [22%]), and hypothyroidism, gastroesophageal reflux disease, peptic ulcer disease, and heart disease (1 patient [11%] each). Six (67%) of the 9 patients had undergone previous abdominal surgery.

Eight of the 9 procedures were completed laparoscopically. Operating times ranged from 122 to 330 minutes (mean, 203 minutes). Excluding the 1 case that was converted to an open procedure, the operative times ranged from 122 to 252 minutes (mean, 187 minutes). All patients who had a completed laparoscopic procedure were discharged to home on postoperative day 1. The 330-minute case was a conversion to the open procedure because of an inability to create a mesocolic window safely. This patient was discharged on postoperative day 3.

Postoperative weight loss at 3 months averaged 25% of excess body weight (range, 15%-31%). At 6 months, 6 patients had an average excess body-weight loss of 39% (range, 29%-44%). Three patients have reached 1 year of follow-up after surgery and have achieved an average excess body-weight loss of 49% (range, 44%-51%). Our conversion rate was 1 (11%) in 9 patients. The only postoperative complication in this series was a marginal ulcer in 1 patient, who was effectively treated with proton pump inhibitors. No patients developed any of the commonly reported complications of anastomotic stenosis, anastomotic leak, deep venous thrombosis, or pulmonary embolus.[3,5,6] No patients required reoperation.

COMMENT

Owing to the lack of published data on patients with extremely elevated BMI, comparison is limited to laparoscopic RYGB studies in the general morbidly obese. Our mean ± SD operative time fell within the range quoted in the last quartile of the study by Demaria et al,[5] which was 162±42 minutes. This was the operative time reported by Demaria et al after they had completed their "learning-curve" cases.[5]

Comparative weight loss between studies is also difficult to gauge. The only reported series that included solely patients with a BMI of greater than 70 had 1 patient specified with a weight loss of 37% at 1 year of follow-up.[3] Similarly, our conversion rate is difficult to interpret. In our first 200 cases of laparoscopic RYGB, we converted only 1.5% of cases to an open procedure. This was on all morbidly obese patients undergoing laparoscopic RYGB. Other large studies[3,5] report a conversion rate of 2.8% to 3%. Finally, since we had 1 complication (marginal ulcer) in a small group, our ulcer rate is difficult to establish. This prevalence of ulcer was 1% in a previous major study of morbidly obese patients undergoing laparoscopic RYGB.[3] Again, we experienced no other complications postoperatively.

Laparoscopic bariatric surgery, specifically laparoscopic RYGB, is a technically demanding procedure. The procedure itself involves many advanced laparoscopic techniques, including bowel reconstruction, bowel anastomosis, intracorporeal suturing, and flexible endoscopy. All of these would be extremely difficult in a normal-sized patient. This megaobese patient population adds the challenges of obesity-related risk factors such as excessive intra- and extra-abdominal adiposity, multiple comorbidities, previous abdominal surgery, and organomegaly,[2] all of which increase the degree of difficulty by several magnitudes. On a degree-of-difficulty scale for laparoscopic surgery of 1 to 10, with 10 being the most difficult, most authors place laparoscopic RYGB at 9.5.[2] Laparoscopic RYGB is often cited as the most difficult of laparoscopic procedures.

Before beginning laparoscopic procedures in the megaobese population, it is advisable to perform many procedures on relatively smaller patients until the surgeon becomes adept at doing laparoscopic RYGB. The learning curve is quite steep, and, although there are varying reports, it is considered to be about 150 cases.[3] In the megaobese patient, the viscera and omentum are

heavier and harder to mobilize, and the mesentery is thicker and more difficult to open. In addition, the mesentary obscures vessels more. Finally, the "simple" task of reaching the work area with staplers, graspers, and needle holders is increasingly difficult. Various maneuvers may be used to circumvent these problems. Additional ports may be added to facilitate the gastric division. In our series, the 5-mm left subcostal port was converted to a 12-mm port to allow passage of the stapler and complete the gastric division. In a few patients, an additional 12-mm port was placed high in the right paramedian area for the same reason. Early problems encountered in creating the mesocolic window were overcome by entering the lesser sac through the gastrocolic ligament. This allowed us to make the mesocolic window from above the transverse mesocolon, rather than from below as it is usually performed. This obviates the need to retract the extremely heavy and relatively immobile omentum cephalad. The mesenteric window is, of course, where the Roux traverses in the retrocolic-retrogastric fashion to the gastric pouch for subsequent anastomosis. In 1 patient, we were unable to accomplish this, which forced conversion to an open procedure. In retrospect, we believe that this converted case could be completed laparoscopically, now that we have completed our learning curve.

All of these procedures were performed with conventional instruments, except for the occasional extra-long grasper. The linear stapler, ultrasonic scalpel, needle holder, and suture were all of conventional length, which significantly hampered performance of the procedure. We are aware that there are physical limitations in instruments, but we strongly believe that longer instruments would greatly facilitate performance of the procedure in this group of patients.

CONCLUSIONS

The laparoscopic approach to RYGB is safe and effective in the megaobese patient population (those with a BMI of >70). Laparoscopic RYGB became subjectively easier as the procedure learning curve was achieved. Some minor modifications to the traditional technique may be necessary. Overall, our institutional experience shows no significant deviations from our traditional approach. We therefore suggest that the megaobese population can be safely treated laparoscopically with minimal extra considerations.

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REFERENCES

1. Scott DJ, Provost DA, Jones DB. Laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Surg Rounds.* 2000;23:177-189.
2. Schauer PR, Ikramuddin S, Gourash W, Ramanathan R, Luketich J. Outcomes after laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Ann Surg.* 2000; 232:515-529.
3. Higa KD, Boone KB, Ho T, Davies OG. Laparoscopic Roux-en-Y gastric bypass for morbid obesity: technique and preliminary results of our first 400 patients. *Arch Surg.* 2000;135:1029-1034.
4. Wittgrove AC, Clark GW. Laparoscopic gastric bypass: endostapler transoral or transabdominal anvil placement. *Obes Surg.* 2000;10:376-377.
5. Demaria EJ, Sugerman HJ, Kellum JM, Meador JG, Wolfe LG. Results of 281 consecutive total laparoscopic Roux-en-Y gastric bypasses to treat morbid obesity. *Ann Surg.* 2002;235:640-647.
6. Wittgrove AC, Clark GW. Laparoscopic gastric bypass, Roux-en-Y—500 patients: technique and results, with 3-60 month follow-up. *Obes Surg.* 2000;10: 233-239.