

Laparoscopic Gastric Bypass in Patients 60 Years and Older: Early Postoperative Morbidity and Resolution of Comorbidities

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Received: 6 January 2009 / Accepted: 24 July 2009 / Published online: 25 August 2009
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Abstract

Background Bariatric surgery has not been routinely presented as an option for patients over 60 years of age. Part of the reason is the long-standing perception that there is additional risk. Additionally, until its recent ruling, Medicare was inconsistent in its coverage, thus making it difficult for some beneficiaries to gain access to the procedures. The aim of this study was to evaluate the perioperative morbidity in our patients who were 60 years of age or older who underwent a laparoscopic gastric bypass Roux-en-Y (LGBRY). We also report the impact of surgery on five objectively graded comorbidities in the early postoperative period.

Methods Our prospectively maintained database was used to identify and report on all patients operated on at our program from January 2002 through January 2007.

Results One hundred twenty patients were identified with 100% follow-up through the perioperative phase and 85% follow-up at 12 months. The mean age was 62 years (range 60–74) with a mean body mass index of 43 kg/m² (range 34–70). All patients underwent an LGBRY. There was no 30-day mortality. Perioperative complications included: 13 strictures, one abscess, two wound infections, three ulcers, two small bowel obstructions, three bleeding episodes in patients who required coumadin, and atrial fibrillation in two patients. The five graded/measurable comorbid

conditions (preop/postop) were diabetes mellitus type II (68/17), hypertension (86/10), obstructive sleep apnea requiring continuous positive airway pressure (CPAP; 48/3), hypercholesterolemia (106/18), and hypertriglyceridemia (60/5).

Conclusions LGBRY can be done safely in patients over 60 years of age in an experienced bariatric program, even in patients with relatively high risk based on their comorbid conditions preoperatively. Resolution of associated comorbidities far exceeds that found with any other treatment modality.

Keywords Gastric bypass · Elderly · Diabetes mellitus type 2 · Sleep apnea syndrome · Laparoscopic surgery

Introduction

Age has remained a controversial topic in bariatric surgery. After initial caution was given by Dr. Mason [1], age over 50 years at the time of bariatric surgery has remained a relative contraindication for bariatric surgery in many programs. As the obesity epidemic has not spared our aging population, numerous studies have recently reevaluated bariatric surgery performed in patients once considered too old to benefit.

Prior to 2006, however, bariatric surgery was not routinely presented as an option for patients over 60 years of age due to the above literature and the inconsistent way in which Medicare dealt with the issue. The Center for Medical and Medicaid Services issued a National Coverage Determination in February 2006. This document was designed to create a unified coverage statement for all of the intermediary insurance companies, thus eliminating the

Commercial Interests: partial funding through a grant from Stryker Corporation.

Each author has read the text and there are no conflicts of interest.

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regional variability in coverage nationally. The Medicare Coverage Advisory Committee found bariatric surgery to be safe and effective in the covered patient population but it also noted that limited data exist on patients who are elderly.

An article by Flum et al. [2] indicated a higher morbidity and mortality rate for patients over 65 years of age undergoing bariatric surgery. The difficult situation we face is that our population is living longer; obesity and morbid obesity are widespread, and there are essentially no long-term successful results from medical weight loss attempts. Dr. Varela's data [3] validated the fact that elderly patients suffer with more severe comorbidities than patients who undergo bariatric surgery who are less than 65 years of age so they represent a higher-risk surgical group.

We undertook this study to evaluate our results of the laparoscopic proximal gastric bypass Roux-en-Y in the elderly population because it was our impression that Flum's data were not consistent with our own. We wanted to critically evaluate the impact of bariatric surgery on the elderly patient population performed in a private-practice setting and high-volume center, using a multidisciplinary team approach. The purpose of this study was to report on the early postoperative morbidity and resolution of specific comorbid conditions in patients aged 60 years and older at the time of their surgery.

Method

Since our first laparoscopic gastric bypass operation for morbid obesity in 1993, we have maintained a prospective nonrandomized database of all surgical patients. This database was used to identify all patients who were at least 60 years of age at the time of surgery and whose surgery was performed between January 2002 and January 2007. All patients were at least 12 months postoperative. All patients underwent a primary laparoscopic proximal gastric bypass Roux-en-Y which we have previously described [4]. All revision procedures were excluded from this study. This study was done within the framework of a well-established bariatric program where over 4,000 laparoscopic gastric bypass operation have been performed.

The operation consisted of a 15-cm³, balloon-measured, proximal gastric pouch. The Roux-en-Y limb of small bowel is measured at 75 cm and is brought up in a retrocolic retrogastric fashion. The gastroenterostomy is created with a 21-mm circular stapler using a transoral anvil placement. All mesenteric defects are closed with suture. All operations were performed by the same surgeon.

Patients did not need to complete a preoperative medical weight loss program. They had specific consultations directed by their personal medical history or as directed by preoperative laboratory testing. Determination of oper-

ative candidacy was by body mass index (BMI) criteria outlined in the 1991 NIH Consensus Development Conference [5]. There was no imposed limitation of upper BMI range. The patients were followed postoperatively, in the hospital, by the operating surgeon and an internist. Following discharge, the patients were followed as per the routine of the bariatric program by the bariatric surgeon and/or the clinic nursing staff.

Though more parameters were routinely followed on all patients, we chose to specifically evaluate the comorbidities of hypertension, diabetes mellitus type II, hypercholesterolemia, hypertriglyceridemia, and severe obstructive sleep apnea requiring the use of CPAP. These indicators were used because of their objective nature for inclusion and resolution.

Complications were defined as follows: death was defined as any death that occurred within 30 days or any death at all related to the surgical procedure within 90 days. Significant bleeding was defined as requiring any amount of transfusion. Leakage was defined as being demonstrated on a radiographic study or at the time of re-exploration. Wound infection was defined as any purulent drainage from a surgical wound, and an abscess was defined as any intraperitoneal infection requiring drainage where an anastomotic leakage was not demonstrated. Stricture was defined as any restriction at the gastroenterostomy which was symptomatic enough to require endoscopy and dilation. Standard objective criteria were used to diagnose atrial fibrillation and small bowel obstruction.

Results

The series includes 120 patients who were at least 60 years of age at the time of their surgery (range 60–74 years, median 62 and mean age of 63.4 years). Fifty-five patients were male for a male/female percentage of 38%/62%. BMI at time of surgery ranged from 34 to 70 kg/m² with an average of 45.2 kg/m². There was 100% follow-up at 90 days (the perioperative phase), 90% follow-up at 9 months, and 85% follow-up at 12 months.

Preoperatively, the patients in this series demonstrated significant illness as defined by the five measured comorbidities. The number and percent of patients who suffered with each comorbid conditions are listed in Table 1. Resolution of those comorbidities is also listed in Table 1. All comorbid determinations were as per the last clinic visit. Though diabetes resolved (normal fasting blood sugar and normal Hgb A_{1c} off medications) in 75% of the patients who suffered with that disease preoperatively, further breakdown of that cohort is also notable. Of the 47 diabetic patients who had been diagnosed for 10 years or less, there were only four patients who still had evidence of diabetes at 30 days. That is

Table 1 Preoperative comorbidities and postoperative resolution

| Preop comorbidity | # of patients (% of total), total N=120 | Resolution of comorbidity |
|---|---|---------------------------|
| Diabetes mellitus type II | 68 (57%) | 51 of 68 (75%) |
| Hypertension | 86 (72%) | 76 of 86 (88%) |
| Sleep apnea | 48 (40%) | 45 of 48 (94%) |
| Hypercholesterolemia | 106 (88%) | 88 of 106 (83%) |
| Hypertriglyceridemia | 60 (50%) | 55 of 60 (92%) |
| Patients with only 3 of 5 comorbidities | 34 (28%) | |
| Patients with 3 or more comorbidities | 74 (62%) | |
| Patients with 4 or more comorbidities | 40 (33%) | |
| Patients with no comorbidities | 5 (4%) preop | 82 (68%) postop |

a 91% rate of resolution. For patients who carried the diagnosis of diabetes for more than 10 years, the resolution rate was eight of 21 patients or only 38% at 90 days (Table 2). All patients who still required treatment for their diabetes were easier to control after the gastric bypass.

Discussion

Printen and Mason [1] reported an 8% mortality rate at 30 days in patients who were over 50 years of age at the time of their bariatric surgery. For years, many surgeons accepted the author's recommendation of not operating on patients over 50 years of age for the indication of morbid obesity. This article was published in 1977 and it should be noted that the 30-day mortality for patients younger than 50 years of age was 2.8%. Some insurance companies still look to articles like this in their rationale to limit bariatric surgery despite the more recent literature showing mortality rates of 0.3% to 0.5%.

Livingston et al. [6] used the National Inpatient Survey database for their report showing a three times higher mortality for patients over 55 years of age as compared to younger patients. Flum et al. noted a 4.8% vs. 1.7% mortality rate for patients over 65 years of age vs. younger patients.

Our data show significant differences from the above studies and are in keeping with other articles with reported series [7–9]. The differences are possibly due to program volume, surgeon experiences, patient selection, type of database used (sampling vs. inclusive), and teaching facilities vs. private practice, or others. Our series shows, as others have as well [10, 11], that patients over the age of 60 have more significant comorbid conditions related to their overweight. We chose to specifically study five comorbid conditions because they are objective and easily definable (both their presence and absence). Cholesterol and triglyceride levels are either elevated or not. Patients either sleep with CPAP or they do not require that treatment modality. And patients either need medication to keep their blood pressure more normalized and blood glucose levels lower or not.

Though our patients suffered with many other morbid-obesity-related comorbidities, those related to the metabolic syndrome are easier to measure objectively, and therefore bias is not introduced when grading severity. Four percent of our studied patients had none of the five related conditions preoperatively; 28% had three of the five comorbidities, and 33% suffered with four or more of the comorbid states evaluated. Fifty-seven percent of our patients suffered with diabetes mellitus type II which is higher than the series with younger patients. Despite this

Table 2 Postoperative complications at 90 days (total N=120)

| | |
|--|---------------------------------------|
| Death | 0 |
| Pulmonary embolus | 0 |
| Strictures | 13 (10.8%) |
| Abscess | 1 |
| Bleeding requiring transfusion(no reoperations required) | 3 (2.5%; all on coumadin) |
| Wound infection | 2 (1.7%) |
| Leak | 0 |
| Atrial fibrillation (A-fib; new onset) ^a | 2 |
| Re-exploration | 2 (1.7%; for small bowel obstruction) |
| Internal hernia | 1 |
| Abdominal wall hernia | 1 |

^a Five patients were in A-fib prior to their gastric bypass

remarkable disease burden before the gastric bypass, the resolution of the five studied comorbid conditions (metabolic syndrome) was truly amazing.

The literature shows the medical control of the metabolic syndrome markers of hypertension, diabetes mellitus type II, and dyslipidemia to be only 4% to 10% in large multicenter studies with thousands of patients followed [12, 13]. In our study, only five of our patients preoperatively had none of the five studied comorbid conditions, whereas postoperatively 82 patients (68%) had none of the studied comorbidities. This resolution was without the use of medications. Resolution of obstructive sleep apnea was 94%, hypertension 88%, hypercholesterolemia 83%, hypertriglyceridemia 92%, and diabetes mellitus type II 75%. Resolution of diabetes was more profound if the patient suffers with the disease for a shorter period of time.

Dr. Pories recognized that the chance of placing diabetes mellitus in complete remission was at least partially determined by the length of time the disease was diagnosed [14]. He noted that “nonresponders” with intact operations were older patients who had their diabetes for a longer duration. Our data are even more striking with resolution of diabetes mellitus type II in 91% of the patients if they carried the diagnosis for less than 10 years vs. 38% if greater than 10 years.

The early complication rate for this group of patient’s was 19%. Benotti et al. found no relationship between age and complication risk. He and others emphasized the fact that the elderly population suffered more preoperative health risks [10, 15]. Complication rates in the range of 0% [16] to 19% have been quoted for elderly patients undergoing bariatric surgery; Varela did see a significant difference in complications between elderly and nonelderly patients [3]. Their study used the University Health System Consortium Clinical Database which consists of data from primarily academia centers. They showed a 26.8% incidence of diabetes mellitus type II and 50.4% incidence of hypertension. Their overall complication rate was 18.9%. They also emphasized that gastric bypass should be done in high-volume centers as the mortality rate was higher in low-volume centers (threefold difference).

Our center is a high-volume center by their criteria of performing >100 cases per year. Within 19%, complication rate includes our stricture rate of 10.8% (requiring dilation) which is higher than our nonelderly patient population (4%). We are admittedly more aggressive at recommending dilation in the elderly population since nutritional status and hydration may be marginal and that may have a more significant impact on their health with their added comorbidities. Reoperation rate (other than endoscopy) was only 1.7%.

The most notable complications in our series are those related to atrial fibrillation. We had two patients spontaneously go into atrial fibrillation postoperatively. We had five

other patients who were in atrial fibrillation at the time of their operation. We found it to be rather difficult to manage coumadin postoperatively. We had three bleeding episodes, requiring transfusion but not requiring reoperation, in our patients on coumadin. We had no requirement for transfusion other than patients on coumadin. We now recommend laboratory evaluation for patients on coumadin every 3–4 days for the first 3 weeks to more closely follow their coumadin effect.

Postoperative complication rate for elderly patients undergoing operative treatment for gastric cancer is 47% [17]. Mortality rate for this group is 7.1%. For the elderly requiring emergency fecal ostomy procedures, the mortality rate is 6.8% [18]. This cohort of morbidly obese patients is sicker, with more medical conditions. The important factor to realize is that many of their life-threatening conditions are related to their morbid obesity, and surgery is the only proven effective long-term treatment for the disease of morbid obesity: just as gastric resection is the best treatment for gastric cancer, and fecal diversion is the best treatment for obstructing colon lesions. Despite the high rate of metabolic syndrome, the early complication rate was quite acceptable when compared to the rate of resolution of these serious objectively definable comorbidities. Again, this is in the setting of a multidisciplinary team, an experienced bariatric surgeon, and high volume.

Conclusions

Laparoscopic gastric bypass Roux-en-Y can be done with low complication rates in patients who are 60 years of age or greater at the time of their operation, when done in a high-volume private-practice setting by an experienced surgeon. This low complication rate is seen even in patients who are relatively high risk based on their associated comorbid conditions preoperatively. The results are very gratifying when the objective comorbid indicators of diabetes type II, dyslipidemia, hypertension, and obstructive sleep apnea were evaluated. The resolution of associated comorbidities far exceeds that found with any other treatment modality.

References

1. Printen KJ, Mason EE. Gastric bypass for morbid obesity in patients more than fifty years of age. *Surg Gynecol Obstet.* 1977;144:192–4.
2. Flum DR, Salem L, Elrod JA, et al. Early mortality among Medicare beneficiaries undergoing bariatric surgical procedures. *JAMA.* 2005;294(15):1903–8.
3. Varela JE, Wilson SE, Nguyen NT, et al. Outcomes of bariatric surgery in the elderly. *Am Surg.* 2006;72:865–9.

4. Wittgrove AC, Clark GW. Laparoscopic gastric bypass, Roux-en-Y—500 patients: technique and results, with 3–60 months follow-up. *Obs Surg*. 2000;10:64–7.
5. Consensus Development Panel. Gastrointestinal surgery for severe obesity: NIH consensus development conference. Consensus statement 1991 March 25–27. *Am J Clin Nutr*. 1992;55(suppl):615s–9.
6. Livingston EH, Langert J. The impact of age and Medicare status on bariatric surgical outcomes. *Arch Surg*. 2006;141(11):1115–20.
7. Fatima J, Houghton SG, Iqbal CW, et al. Bariatric surgery at the extremes of age. *J Gastrointest Surg*. 2006;10(10):1392–6.
8. Shawn D, St Pater MD, Randall O, et al. Impact of advanced age on weight loss and health benefits after laparoscopic gastric bypass. *Arch Surg*. 2005;140:165–8.
9. Nelson LG, Lopez PP, Haines K, et al. Outcomes of bariatric surgery in patients >65 years. *Surg for Obes Relat Dis*. 2006;2:384–8.
10. Sugeran HJ, DeMaria EJ, Kellum JM, et al. Effects of bariatric surgery in older patients. *Ann Surg*. 2004;240(2):243–7.
11. Dunkle-Blatter SE, St Jean MR, Whitehead C, et al. Outcomes among elderly bariatric patients at a high-volume center. *Surg Obes Relat Dis*. 2007;3(2):163–9.
12. McFarlane SI, Jacober SJ, Winer N, et al. Control of cardiovascular risk factors in patients with diabetes and hypertension at urban academic medical centers. *Diabetic Care*. 2002;25(4):718–23.
13. Grant RW, Buse JB, Meigs JB, et al. Quality of diabetic care in U. S. academic medical centers: low rates of medical regimen changes. *Diabetic Care*. 2002;28:337–442.
14. Pories WJ, Swanson MS, MacDonald KG, et al. Who would have thought it? An operation proves to be the most effective therapy for adult-onset diabetes mellitus. *Ann Surg*. 1995;222(3):339–52.
15. Benotti PN, Wood GC, Rodriguez H, et al. Perioperative outcomes and risk factors in gastric surgery for morbid obesity: a 9 year experience. *Surgery*. 2006;139:340–6.
16. Quebbemann B, Engstrom D, Siegfried T, et al. Bariatric surgery in patients older than 65 years is safe and effective. *Surg Obes Related Dis*. 2005;1:389–93.
17. Schwartz RD, Karpeh MS, Brennan MF, et al. Factors predicting hospitalization after operative treatment for gastric carcinoma in patients older than 70 years. *J Am Coll Surg*. 1997;184:9–15.
18. Bosshardt TL. Outcomes of ostomy procedures in patients aged 70 years and older. *Arch Surg*. 2003;138(10):1077–82.