A Bariatric Surgery Center of Excellence: Operative Trends and Long-Term Outcomes

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BACKGROUND: Surgery remains the most effective intervention for obesity and its comorbidities. However, the long-term efficacy of bariatric procedures is rarely reported. This study addresses operative trends, efficiency, and long-term outcomes from a large bariatric program.

STUDY DESIGN: Data were prospectively collected on 3,460 patients undergoing 3,503 operations from January 2004 to March 2013. Primary procedures included Roux-en-Y gastric bypass (RY; n = 2,966), adjustable band (AB; n = 352), and sleeve gastrectomy (SG; n = 118). There were 67 revisional procedures (RP). Mean operative time, hospital length of stay, major 30-day morbidity/mortality, follow-up compliance, and weight loss per procedure at follow-up were recorded.

RESULTS: Mean operative times decreased to the following: RY, 53 minutes; AB, 35 minutes; SG, 46 minutes; and RP, 71 minutes. Mean length of stay was reduced to the following: RY, 1.53 days; AB, 0.97 days; SG, 2.12 days; and RP, 2.68 days. Major complications were mortality, 0.09%; leak, 0.51%; bleed, 2.37%; pneumonia, 0.63%; venous thromboembolism, 0.40%; and reoperation, 2.34%. The complication rate was lowest for AB and highest for SG ($p < 0.05$). Adjustable band was the initial procedure in 73% of cases requiring RP. Follow-up compliance was 93% at 1 year, 79% at 3 years, 71% at 5 years, and 33% at 9 years. Adjustable band offered significant weight loss at 1 and 3 years ($p < 0.0001$), but less than RY or SG ($p < 0.0001$). Excess weight loss was not significantly different between RY and SG at 1 year. Significant weight loss with RY persisted at 7 to 9 years ($p < 0.0001$).

CONCLUSIONS: Our bariatric program experienced an increase in SG and RP and a decrease in AB. Optimization of care reduced operative time and length of stay. All procedures achieved significant weight loss in the first year. Adjusted band had the lowest morbidity, but inferior weight loss and greater need for revision. Long-term weight-loss data are only available for RY. (J Am Coll Surg 2014;218:1163−1174. © 2014 by the American College of Surgeons)

Overall, approximately 68% of Americans weigh more than a healthy individual should. Frank obesity, as defined by a body mass index (BMI; calculated throughout as kg/m^2) $\geq$30, affects more than one third (33.8%) of adults in the United States.[1,2] Extreme obesity (BMI $\geq$ 40) is found in 5.7% of the population.[1] An additional 34.2% of American adults can be defined as overweight (BMI = 25 to 30).[3] The prevalence of obesity appears to be increasing in this country, as it was only 15% in 1980.[4] Socioeconomic factors (eg, limited education, lower income, Medicaid patients) as well as racial, ethnic, and geographic variations (eg, higher numbers of African American and Hispanic individuals) seem to play a role in placing at higher risk certain segments of the US population.[5] In recent years, possibly as a result of globalization of available lifestyle choices, several other countries have experienced a similar increase in prevalence of obesity.[6-8]

The adverse effects of obesity on various organ systems (eg, metabolic syndrome, diabetes mellitus, hypertension, hyperlipidemia, other cardiovascular diseases, pulmonary dysfunction, nonalcoholic steatohepatitis, musculoskeletal disorders, psychological health, certain cancers, and reduction in overall life expectancy) have been well documented in the past several years.[9-15]

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Abbreviations and Acronyms

AB = adjustable band
BMI = body mass index
EWL = excess weight loss
LOS = length of stay
RP = revisional procedure
RY = Roux-en-Y gastric bypass
SG = sleeve gastrectomy
VTE = venous thromboembolism

Recently, the American Medical Association, at its annual meeting in Chicago, officially recognized obesity itself as a disease, after a recommendation in 2008 by the Obesity Society.[16]

Although a multitude of nonsurgical options are available to obese individuals, surgical intervention has proven the most reliable and effective method to achieve weight loss.[17,18] Different surgical procedures have been used during the past 6 decades, with estimates of nearly 350,000 procedures performed worldwide in 2008, approximately half of which were done in the United States.[19] Roux-en-Y gastric bypass (RY) has been the most commonly performed bariatric procedure, accounting for 88% of all cases in 2002.[20] Since its introduction in the mid 1990s, laparoscopic RY has surpassed in use its open counterpart and, by 2005, 75% of gastric bypasses were done laparoscopically.[21] Another commonly available bariatric procedure has been an adjustable gastric band placement (AB). In recent years, sleeve gastrectomy (SG), formerly a component of biliopancreatic diversion with duodenal switch, has emerged as a viable stand-alone bariatric surgical option.

The recognition of an inverse correlation between postoperative complications and surgeon experience[22] prompted the publication of practice guidelines in bariatric surgery,[2] the establishment of Centers of Excellence recognized by the American Society for Metabolic and Bariatric Surgery and the American College of Surgeons, as well as the availability of surgical outcomes to the public (eg Healthgrades). The standardization of data reporting and need for follow-up have allowed a better evaluation of both short-term and long-term results for different bariatric procedures. Despite the recognized efficacy of bariatric surgery in achieving weight loss for the first 1 to 2 postoperative years, there appears to be a paucity of studies addressing its long-term ability to sustain its results.

The purpose of our study was to assess efficiency, morbidity, long-term outcomes, and operative trends over time from a large bariatric surgery program run by a limited number of established surgeons in a community setting.

METHODS

Patients

This study is a retrospective analysis of prospectively collected data from a single community hospital bariatric surgery center. The bariatric program was developed using best-practice models, as described in the Commonwealth of Massachusetts, Betsy Lehman Center for Patient Safety and Medical Error Reduction, Expert Panel on Weight Loss and Surgery, Executive Report,[23] and the American Society of Bariatric Surgery Center of Excellence Standards. Our center is recognized by the American Society of Bariatric Surgery as a Bariatric Surgery Center of Excellence. The study was approved by the Institutional Review Board.

The surgeons who performed all procedures in this study (RSK, TTS, DAC), in addition to possessing advanced laparoscopic surgical skills, participated in structured training in bariatric surgery (mini-fellowship) at a designated center site. Credentialing of each surgeon followed the Lehman panel recommendation of onsite proctoring of the surgeons for the initial 25 laparoscopic RY procedures.

The study includes 3,460 consecutive patients operated on from January 8, 2004 to March 31, 2013. There were 574 male patients (16.6%) and 2,886 females (83.4%). Age ranged from 18 to 74 years (mean 44 years). The total number of operative procedures was 3,503. For each variable assessed, the data on patients and/or procedures reported in the analysis were limited to those where complete and reliable information was available.

Patient selection

Patients entered into our study had an initial BMI, at the time of enrollment into our weight loss program, between 34 and 80 (Table 1).

Indications for surgical treatment

Patients were considered candidates for bariatric surgery if they met the criteria listed in the National Institutes of Health Consensus Development Conference Statement of March 25–27, 1991.[24]

Preoperative evaluation

Once a candidate met the criteria for surgery, he or she underwent a multidisciplinary team assessment, which involved dietetic, medical, psychological, and surgical evaluations. Dietetic consultation focused on overall nutritional assessment and education, with particular emphasis on adequate hydration, protein intake, and vitamin supplementation postoperatively. Psychological and/or psychiatric consultation focused on screening and evaluation of