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Original article

Effect of perioperative management on short-term outcomes after sleeve gastrectomy: a 600-patient single-center cohort study

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Abstract

Background: Reports on the postoperative outcomes of sleeve gastrectomy (SG) have only been from small, single-center series and meta-analyses of studies with variable SG management. The objective of this study was to evaluate post-SG outcomes in a specialized bariatric surgery center with a routinely performed standardized procedure.

Methods: The postoperative complication rate, operating times, and postoperative data were evaluated from all patients undergoing a primary SG between November 2004 and February 2012. Results were analyzed for 3 separate surgical periods, which differed with perioperative management.

Results: Of 600 patients (mean age: 41.8 ± 11.3; mean body mass index [BMI]: 47.2 ± 16 kg/m²; 80% were women who underwent primary SG), 26.8% had a BMI ≥50 kg/m². The mean operating time was 84 minutes. The rate of conversion was 1%. There were no postoperative deaths. The overall complication rate was 8.5%; the major complication rate was 5.6%; the revisional surgery rate was 4.6% and the gastric leak rate was 2.5%. Over the course of the 3 study periods, the operating time fell from 91 ± 32 to 79 ± 22 minutes ($P \leq .001$); the length of hospital stay decreased from 4.5 ± 4.9 to 3.4 ± 4.3 days ($P = .02$); the major complication rate fell from 6.4% to 5.5% (P = NS); and the gastric fistula rate decreased from 4.6% to 1.9% (P = NS).

Conclusion: In a specialist bariatric surgery center, SG had an acceptable complication rate. Modifications in the perioperative management of SG were associated with a shorter mean operating time and hospital stay and did not increase the major complication or gastric fistula rates. (Surg Obes Relat Dis 2014;▮:00–00.)

Keywords: Laparoscopic sleeve gastrectomy; Gastric fistula; Complications after sleeve gastrectomy; Morbid obesity

Several studies have shown an increase in the incidence of obesity, which is now a global public health problem that affects all ages, all socioeconomic classes and all parts of the world [1–3]. There are several surgical techniques for the treatment of morbid obesity. Laparoscopic sleeve gastrectomy (SG) has grown in popularity because of its apparent technical ease, good results (in terms of weight loss and improvement of co-morbidities) [4], and low postoperative complication rates. It is considered that SG results in fewer complications than the duodenal switch [5] or Roux-en-Y gastric bypass (RYGB) [6] due to the absence of an anastomosis. However, the literature on the complication rate is derived from small series (fewer than 200 patients) [7,8] or from a meta-analysis [9] of centers that differed in terms of the surgeons' experience, SG

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technique, and surgical equipment. The objective of the present study was to evaluate the results of a primary SG (performed according to a standardized technique by experienced surgeons in a specialist bariatric surgery center) in terms of immediate postoperative morbidity and mortality.

Material and methods

Population

We performed a retrospective analysis of Amiens University Hospital and Jules Verne University of Picardie's prospective database by selecting all patients having undergone primary SG between November 2004 and February 2012. All procedures were performed by 2 bariatric surgeons. The indication for bariatric surgery had been validated in a multidisciplinary staff meeting and in accordance with French national guidelines [10]. All patients attended a surgical consultation and a nutrition/dietetics consultation and underwent respiratory, endocrine, and psychological assessments. Screening for hiatus hernia and *Helicobacter pylori* infection was performed gastroscopically. Respiratory function tests (sleep polysomnography) were used to screen for obstructive sleep apnea syndrome (OSAS).

The surgical procedure

We have previously described our technique for primary SGs [11]. A 34-gauge French bougie was used when transecting the greater gastric curvature. Transection began 6 cm proximal to the pylorus. For patients having undergone SG between January 2004 and December 2009, stapling was performed using Endo GIA Universal XL 60 with 2 3.5-mm green reloads and then 4 or 5 4.8-mm blue reloads (Coviden France SAS, Elancourt, France). For patients having undergone SG from January 2010 to February 2012, purple Tri-Staple reloads were used. A methylene blue test was always performed at the end of the procedure. All patients underwent an upper gastrointestinal tract examination with oral contrast agent (diatrizoic acid) on postoperative day (POD) 1, to check for the absence of complications and enable oral refeeding.

Between 2004 and 2007, a nasogastric tube was always left in place at the end of surgical procedure. The nasogastric tube was removed when the results of an upper gastrointestinal tract examination with oral contrast agent were normal. From 2008 onwards, the nasogastric tube was removed in the operating theatre after completion of the SG. Between 2004 and 2009, a 10-gauge French drain was always left in place along the gastric resection line. Removal of the drain was performed on the second POD if there was no event (relative to bleeding or digestive fluid in the abdominal drain). Drainage was not used from 2010 onwards.

Inclusion criteria

Patients included in the study had to meet all of the following criteria: morbid obesity according to the official French definition [10], primary SG, and no history of bariatric surgery. We excluded patients having undergone (i) SG after previous gastric band (GB) removal, (ii) GB removal and SG in the same surgical procedure, (iii) repeat SG, or (iv) other bariatric surgical procedures (GB, duodenal switch, and RYGB).

Study criteria

The study's primary efficacy criterion was the postoperative complication rate (according to Clavien's classification [12]) over the first 3 postoperative months. The secondary efficacy criteria were gastric fistula rate, bleeding rate, operating time, length of hospital stay, and risk factors for gastric fistula. Each study criterion was then evaluated for 3 different periods: from 2004 to 2007 (with the abdominal drain and nasogastric tube in place before leaving the operating theatre), from 2008 to 2009 (an abdominal drain but no nasogastric tube), and from 2010 to March 2012 (no abdominal drain or nasogastric tube).

The study parameters included: preoperative data: age, gender, body mass index (BMI), co-morbidities (diabetes mellitus, hypertension, dyslipidemia, metabolic syndrome, and OSAS); Operating data: operating time, conversion rate and causes, and the perioperative complication rate; and short-term outcomes over the first 3 postoperative months: postoperative complications (according to Clavien's classification [12]), length of hospital stay, and revisional surgery rate.

Statistics

All statistical analyses were performed with SAS software (version 4.3, SAS Institute Inc., Cary, NC, USA). Categorical variables were compared in a X^2 test. The results are quoted as the mean ± SD (range) or the number (percentage). Quantitative variables were compared in an analysis of variance. All tests were 2-tailed, and the threshold for statistically significance was set to $P < .05$.

Results

Preoperative data

During the study period, 705 patients underwent primary or secondary SG. Six hundred patients underwent primary SG, 23 patients underwent SG after previous GB removal, 67 underwent GB removal and SG in the same procedure, and 15 underwent repeat SG. The SG group's mean (range) age was 41.8 ± 11.3 years (18–65) including 475 women (80%). The preoperative BMI was 47.2 ± 16 kg/m² (30.1–74.5). One hundred and sixty-one patients had a BMI ≥50 kg/m² (26.8%). Co-morbidities included diabetes mellitus