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Original article

The effect of laparoscopic sleeve gastrectomy with or without hiatal hernia repair on gastroesophageal reflux disease in obese patients

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Abstract

Background: Obesity is an independent risk factor for gastroesophageal reflux disease (GERD), which is often associated with the presence of a hiatal hernia (HH). Despite increasing popularity of laparoscopic sleeve gastrectomy (LSG) in bariatric surgery, its effect on GERD is still unclear. The objective of this study was to evaluate the effect of LSG with or without hiatal hernia repair (HHR) on GERD in obese patients.

Methods: Seventy-eight patients with HH underwent LSG with concomitant HHR (LSG+HHR group). Their data were compared with that of 102 patients without HH, who underwent only LSG (LSG-group). All patients underwent a standardized questionnaire, a double-contrast barium swallow, and an upper-gastrointestinal endoscopy before the surgical procedure and at least 6 months later.

Results: At baseline, the prevalence of GERD symptoms and their frequency-intensity scores did not differ between groups. At follow up, there was a significant decrease in the prevalence of typical GERD symptoms only in the LSG-group ($P = .003$). LSG+HHR patients showed a significantly higher heartburn frequency-intensity score compared with LSG patients ($P = .009$).

Conclusion: This finding confirms that LSG has a beneficial effect on relieving GERD symptoms, although the underlying mechanisms are still unclear; conversely, the procedure of HHR did not produce any improvement in GERD symptoms. (Surg Obes Relat Dis 2014;10:250–256.)

Keywords: Obesity; Gastroesophageal reflux disease; Laparoscopic sleeve gastrectomy; Hiatal hernia repair

Gastroesophageal reflux disease (GERD) is defined as reflux of stomach content causing troublesome symptoms and/or complications [1]. According to the Montreal Consensus Conference, patients may be diagnosed based on typical symptoms alone [1]. The presence of hiatal hernia (HH) is closely associated with GERD and its complications [2–4]. The HH diagnosis is based on indirect techniques: double-contrast barium swallow (dc-BS), upper-gastrointestinal endoscopy (UGIE), or manometry [5]. These techniques do not allow the direct assessment of the gastroesophageal junction, which is easily disclosed intraoperatively during upper abdominal surgery procedures. The presence of HH is frequent in obese patients [6,7], and obesity is considered an independent risk factor for GERD. It has been suggested that a higher BMI causes an increased prevalence of GERD by increasing the risk of developing HH [8]. Among all surgical techniques performed in obese patients, laparoscopic Roux-en-Y gastric bypass seems to be the most promising in achieving weight reduction and in

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improving GERD [7]. Furthermore, in obese patients submitted to laparoscopic gastric banding (LGB) or laparoscopic Roux-en-Y gastric bypass, a concomitant HH repair (HHR) has been performed with good results on GERD symptoms regardless of HH size [9,10]. In the past years, laparoscopic sleeve gastrectomy (LSG) has gained increasing popularity in the surgical treatment of obese patients, but current data of its effect on GERD are still controversial [11]. In addition, there are only a few studies investigating the effect of the concomitant repair of HH during LSG on GERD [12,13], which despite some methodological limitations, suggest an improvement of symptoms. The aim of the present study was to research the effect of LSG alone or combined with HHR on GERD symptoms in obese patients.

Methods

From January 2007 to April 2011, 180 obese patients eligible for bariatric surgery [14] underwent LSG. Seventy-eight consecutive patients, in whom sliding HH was intraoperatively disclosed, underwent LSG with concomitant HHR (LSG+HHR group), and 102 obese patients, similar for age and gender distribution in whom no HH was intraoperatively disclosed, underwent only LSG (LSG-group). The study was approved by the institutional review board of the university hospital. Adherence to the ethical conduct standards of the Declaration of Helsinki ensured patients' welfare [15]. Informed consent was obtained from all patients.

Protocol

The preoperative evaluation included a careful medical history, evaluation of co-morbidities (i.e., hypertension, dyslipidemia, diabetes [16]), a dc-BS, an UGIE, and an assessment of GERD symptoms. The postoperative evaluation was performed at least 6 months after the bariatric surgery and included a reassessment of GERD symptoms. If a patient was positive for GERD, he underwent a second dc-BS.

Surgical technique

The surgical technique has been previously described [17]. Briefly, the presence of HH was identified according to the following protocol: upon incision of the lesser omentum but before incision of the peritoneum over the pillars, the hiatus was examined for a HH with paraesophageal involvement to exclude these patients from the study. After incision of the peritoneum, gastroesophageal junction and its relationship to the hiatus were carefully identified to disclose the presence of sliding HH [18]. Whenever intraoperative HH was found it was always posteriorly repaired on the basis of the following technique: the esophagus was encircled, and the diaphragmatic crura were completely dissected to the mediastinal space. The gastric herniation was reduced into the abdomen. Reconstruction was performed using nonabsorbable (0 Ethibond) interrupted sutures reinforced with a 1×1 pledget of Marlex (Bard ®, Murray Hill, NJ), Vascu-Guard ® and Veritas ® (Collagen Matrix, Synovis Surgical Innovations, St Paul, MN), calibrated on a 40-French orogastric bougie. The gastric greater curvature was freed up to the cardioesophageal junction close to the stomach with the use of a vessel-sealing device (Ultracision Harmonic Scalpel, EES, Cincinnati, OH; LigaSure, Covidien, Mansfield, MA) sparing the gastroepiploic vessels. The final surgical preparation was a mobilized stomach tethered at the celiac axis. The stomach was resected with the linear stapler parallel to a 40-French orogastric tube along the lesser curve. The calibrating bougie was replaced by a nasogastric tube positioned in the distal stomach to perform the methylene blue dye test for determination of staple-line integrity then, the resected stomach was removed. Concomitant cholecystectomy was performed in all patients with preoperative ultrasound evidence of lithiasis.

GERD symptoms assessment

Participants underwent an assessment of GERD symptoms using a standardized questionnaire evaluating the prevalence of typical GERD symptoms (heartburn and/or regurgitation). The frequency of heartburn and regurgitation was scored from 0 to 3 (0 = absent; 1 = 2 day/week; 2 = 3–5 d/wk; and 3 = 6 or 7 d/wk). The intensity of heartburn and regurgitation was scored from 0 to 3 (0 = absent; 1 = not very bothersome, not interfering with daily activities; 2 = bothersome, but not interfering with daily activities; and 3 = interfering with daily activities). A score out of a maximum of 6 was obtained for each symptom, which was defined as a mild (1–2), moderate (3–4), and severe (5–6) symptom frequency-intensity score [19,20].

Statistical analysis

Data are expressed as mean ± standard error (M ± SE) unless otherwise indicated. χ^2 and Mann-Whitney (M-W) U tests were used to compare nonparametric data and ANOVA for parametric data. The McNemar (χ^2 test for within-patients) and Wilcoxon tests were used to compare the prevalence of a binary variable in the same patients (i.e., the prevalence of GERD symptoms prebariatric surgery versus postbariatric surgery in the LSG+HHR and LSG groups) and the frequency-intensity score within patients, respectively. A multiple linear regression analysis was constructed as appropriate. The significance level was set below .05. The statistical program used was the Statistical Package for Social Sciences (SPSS) for Windows, version 12.0.

Results

Preoperative evaluation

Demographic characteristics of participants are shown in Table 1.