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Original article

Lack of correlation between gastroesophageal reflux disease symptoms and esophageal lesions after sleeve gastrectomy

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Abstract

Background: The postoperative development or worsening of gastroesophageal reflux disease (GERD) represents the major drawback of laparoscopic sleeve gastrectomy (SG). A GERD diagnosis is often based only on symptoms and proton pump inhibitors (PPI) intake, while objective tests like esophagogastroduodenoscopy and pH measurements are performed less frequently.

Objectives: To evaluate the association between reflux symptoms and GERD-related esophageal lesions.

Settings: University hospital, Rome, Italy.

Methods: A comprehensive clinical control entailing GERD symptoms, PPI intake, and esophagogastroduodenoscopy was proposed to all patients who underwent SG between June 2007 and February 2011, irrespective of the presence of GERD symptoms. One hundred forty-four of 219 patients agreed to take part in the study (follow-up rate: 65.8%).

Results: After a mean follow-up of 66 months, GERD symptoms and PPI intake were recorded in 70.2% and 63.9% of patients, respectively. Mean visual analogue scale score was 2.9 ± 3.3 . The overall frequency of erosive esophagitis was 59.8%, while nondysplastic Barrett's esophagus was detected in 13.1%. The frequency of esophageal biliary reflux was 68%. GERD symptoms and visual analogue scale score were not significantly associated with the development of erosive esophagitis and Barrett's esophagus and the severity of the esophageal lesions. Moreover, the frequency of erosive esophagitis and Barrett's esophagus in patients consuming PPI were similar to that of patients without PPI.

Conclusion: Symptoms investigation alone is not a reliable tool to diagnose GERD after SG. The use of objective diagnostic tests, such as esophagogastroduodenoscopy, should be carefully considered in the postoperative follow-up schedule of SG patients. (Surg Obes Relat Dis 2018;■:00–00.)

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Keywords:

Sleeve gastrectomy; Gastroesophageal reflux disease; Barrett's esophagus; Esophageal biliary reflux

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The effect of laparoscopic sleeve gastrectomy (SG) on gastroesophageal reflux disease (GERD) is still an unsolved issue. GERD occurrence after SG may be related to the development of an imbalance between the intragastric pressure and the tone of lower esophageal sphincter [1]. SG decreases gastric compliance due to the removal of the

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gastric fundus [2]. On the other hand, lower esophageal sphincter tone can decrease as a consequence of the blunting of the angle of His, the division of the muscle fibers of Helvetius, and the presence of a hiatal hernia (HH) [3,4]. The observation of a proper surgical technique can reduce the extent of this imbalance. In fact, it is of importance to achieve a regular-shaped gastric tubule (without stenosis or fundus residual) and to preserve the integrity of the sling fibers when approaching the angle of His [5–9]. HH repair (HHR) may be of use, even if current data are not conclusive [10–13]. GERD diagnosis after SG has been often based on symptoms evaluation and proton pump inhibitor (PPI) consumption. However, published papers have reported conflicting results. In fact, while some studies showed the development of de novo GERD after SG or the worsening of preexisting reflux symptoms, in other studies postoperative improvement of GERD has been reported [1]. To date, specific diagnostic examinations like esophagogastroduodenoscopy (EGD), esophageal manometry, 24-pH monitoring, or 24-hour multichannel intraluminal impedance pHmetry (MII-pH) have been used in a small number of studies, with inconsistent outcomes [1]. In our previous paper [14], we preliminary reported that GERD symptoms were more frequent and severe in patients with mild erosive esophagitis (EE; grade A and B according to Los Angeles Classification) than in those with severe EE (grade C and D). Moreover, the lowest mean visual analog scale (VAS) score was registered in patients with Barrett's esophagus (BE) [14].

The aim of this study was to investigate the predictive value of GERD symptoms for the development of EE and BE and the severity of the esophageal lesions in patients who underwent SG.

Methods

Study design

Between July 2007 and February 2011, 249 patients with a mean body mass index of $46.2 \pm 7.2 \text{ kg/m}^2$ underwent SG in our bariatric unit. All patients underwent a multidisciplinary workup, including history and physical examination, routine laboratory evaluation, EGD, abdominal ultrasonography, and nutritional and psychiatric evaluation. Upper gastrointestinal contrast study was performed only in patients with endoscopic findings, such as esophageal diverticula, achalasia-like aspect of the esophagus, and abnormal shape of the stomach and of the duodenum, to rule out possible contraindications to SG. GERD symptoms (acid reflux, regurgitation, heartburn) were evaluated by means of VAS score. All data were collected in a prospective database. Twenty-two patients were excluded from the study because they underwent SG as a revision procedure for insufficient weight loss or weight regain after gastric banding (17 patients) or vertical banded gastroplasty

(5 patients). An additional 8 patients were excluded because they experienced major postoperative complications (3 leaks, 4 bleeding, and 1 middle-gastric stenosis). A clinical control study of EGD, laboratory tests, VAS evaluation of GERD symptoms, and PPI consumption was prospectively to all the patients with primary SG, regardless of the presence of GERD symptoms [14]. All the clinical controls and the EGD were performed between January 2014 and June 2015. All the participating patients signed an informed consent, and the local institutional review board approved the study.

SG surgical technique

Surgical technique has been illustrated elsewhere [15]. A 48-Fr bougie was used to tailor the SG, starting the resection of the stomach 6 cm above the pylorus. Special care was taken to avoid stenosis at the level of the incisura angularis. To achieve a radical “fundectomy,” the gastric fundus and the posterior gastric wall were completely mobilized until the left pillar was exposed. If present, HH was always repaired by posterior hiato-plasty.

Endoscopy

EGD was performed by means of a high-definition gastroscope (Evis Exera II; Olympus Corp., Tokyo, Japan) with lidocaine spray and under conscious sedation (midazolam iv). Esophagitis, when present, was classified according to the Los Angeles Classification [16]. The presence of esophageal biliary-like reflux (EBR) was registered. The endoscopic appearance of BE was evaluated according to the guidelines of the American Gastroenterological Association [17] and the American Society for Gastrointestinal Endoscopy [18]. When BE was suspected, the International C&M classification (Prague classification) was applied, measuring the circumferential and the maximal proximal extent of the BE mucosal tongue from the upper incisors. In these cases, the Seattle biopsy protocol was applied: 4-quadrant biopsy sampling at every 1 to 2 cm of the columnar lined esophagus [19].

Statistical analysis

Statistical analysis was performed with STATA software (version 11). χ^2 testing was used to compare categorical variables between patients with or without EE and BE, whereas continuous variables were compared using a Student's *t* test. Differences were considered statistically significant for *P* values < .05. The association between the development of GERD-related esophageal lesions and the presence of reflux symptoms was investigated with logistic regression analysis. The correlation between VAS score and the development of EE and BE has been evaluated with multiple linear regression analysis.

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