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Original article

Comparison between major and minor surgical procedures for the treatment of chronic staple line disruption after laparoscopic sleeve gastrectomy

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Abstract

Background: Laparoscopic sleeve gastrectomy (LSG) has become the most common weight loss surgery procedure. The procedure's most dreaded surgical complication is staple-line disruption (SLD). So far, no definitive treatment modality has been established for this complication.

Objectives: The aim of this study is to review the treatment options used at our institution for patients with SLD after LSG and to evaluate the outcome of different interventions.

Methods: A retrospective review of a prospectively collected database of all patients who underwent SLD between January 2005 and April 2014 was performed. SLD was defined as a leak identified on computed tomography or upper gastrointestinal series. We compared the cure rate between a major surgical procedure and patients treated with a variety of other minor treatment modalities. Special focus is given to the technique of proximal gastrectomy with Roux-en-Y esophagojejunostomy (PGEJ). The procedure consists of the en bloc resection of the proximal stomach immediately proximal to the gastroesophageal junction and including the fistulous tract. The jejunum is transected 50 cm distal to the ligament of Treitz and reconstruction of the gastrointestinal tract is performed with a Roux-en-Y esophagojejunostomy.

Results: Thirty-one patients had SLD after their LSG. Patients were divided into 2 groups based on the treatment modality: Group A (PGEJ) and Group B (minor surgical procedure). Group A (n = 19) had 1 releak. Group B (n = 11) had 5 releaks. The cure rate for patients who underwent PGEJ was 94.7%. The cure rate for patients who were treated with a different approach was 54.5% ($P = .01$).

Conclusion: Our experience demonstrates that the cure rate of PGEJ is high. Minor surgical procedures are effective in approximately half of the patients, so when the leak becomes chronic, PGEJ can provide a long-term solution. (Surg Obes Relat Dis 2016;▮:00–00.)

Keywords: Bariatric surgery; Sleeve gastrectomy; Staple line disruption; leak; Complication

Sleeve gastrectomy has become the most common and preferred surgical treatment modality for severely obese patients in the United States [1–3]. Among the bariatric stapling operations, it has the least amount of possible complications [2]. Although rare, complications related to this approach include bleeding, stenosis, staple-line disruptions (SLD), and gastroesophageal reflux disease [4]. SLD and leaks are the most feared and potentially devastating surgical complications and there is growing concern on the

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best treatment modality [2]. Leak rates after laparoscopic sleeve gastrectomy (LSG) have been quoted throughout the literature being as low as .79% [1] and as high as 2.4% [5] in large retrospective studies [3].

SLD are most often located at the angle of His and less frequently observed at the antrum or gastric body [3]. Leaks that occur at the angle of His tend to develop into a chronic fistula [5]. Some theories currently seek to explain why leaks occur more frequently at this specific location. The vascular theory attributes the leaks to reduced perfusion in the staple line area, and the mechanical theory suggests that a high-pressure system due to pyloric conservation is created with the sleeve gastrectomy [6,7].

Management of proximal SLD is controversial and dependent on variables such as duration and location of the leak. Debate exists among bariatric surgeons over the use of operative and nonoperative techniques in treating this dreaded complication. Factors that should be taken into consideration are the localization of the fistulous tract, diameter of the distal stomach, presence of a stenosis, time of onset, size of staple-line disruption, and hemodynamic condition of the patient [7].

Nonoperative approaches include total parenteral nutrition (TPN), intravenous antibiotics, percutaneous drainage of intraabdominal collections, endoscopic injection of fibrin glue to treat fistula, endoscopic pyloric balloon dilation, and self-expandable stents [8]. Operative techniques include laparoscopic drainage and suture closure of SLDs, t-tube gastrostomy, gastrojejunostomy to the fistulous tract, wedge resection of the fundus, and gastric bypass [9].

The aim of this study is to describe the outcome of different treatment modalities for SLD after LSG, specifically focusing on the definitive use of a proximal gastrectomy and reconstruction with Roux-en-Y esophagojejunostomy (PGEJ) for the treatment of this complication.

Methods

After Institutional Review Board approval and adhering to Health Insurance Portability and Accountability Act guidelines, we retrospectively reviewed the charts of all patients presenting to our institute from January 2005 to April 2014 with chronic staple-line disruptions after undergoing LSG. Patients who had the original operation at the Cleveland Clinic Florida or were referred from an outside institution were included in the study.

The diagnosis of SLD was made in the majority of cases by computed tomography of the abdomen and pelvis or upper gastrointestinal series. Chronic SLD were defined as a leak that persisted >12 weeks [3]. At the time of presentation, the decision to undergo one of the treatment modalities was based on clinical status and patient and surgeon preference. Also, leak surface was observed radiologically, and size was estimated on imaging studies but did not affect our decision to operate or to choose a specific treatment modality. Cure rate was defined as the complete resolution of leakage from the staple line.

The definition of PGEJ is as follows: The procedure consists of the en bloc resection of the proximal stomach immediately proximal to the gastroesophageal junction and including the fistulous tract. The jejunum is transected 50 cm distal to the ligament of Trietz and reconstruction of the gastrointestinal tract is performed with a Roux-en-Y esophagojejunostomy.

Statistical analysis

Patients were divided into 2 groups. Group A included patients that were treated with PGEJ, considered a major surgical operation; Group B included patients that were managed with another treatment modality, considered as a minor surgical procedures.

One patient underwent a Roux-en-Y gastric bypass. This patient did not belong to any of the treatment groups and therefore was not included in the statistical analysis. Analysis of data was performed using SPSS 11.0 statistical analysis software (SPSS Inc., Chicago, IL, USA). Fisher's exact test was used to calculate statistical significance difference in the cure rate between group A and group B; P value $<.5$ was considered statistically significant.

The aim of this study is to review the treatment options used in our institution for patients with staple line disruptions after sleeve gastrectomy and to evaluate the outcome of major and minor surgical intervention for this surgical complication. Special focus is given to the technique of PGEJ and its cure rate.

Technique of proximal gastrectomy with Roux-en-Y esophagojejunostomy. The technique that we utilize has been thoroughly described in a previous publication [9]. The procedure begins with exposing the right crus of the diaphragm (Fig. 1). We consider this a key landmark to pursue a safe hiatal dissection. Careful dissection is carried out posterior to the esophagus to identify the left crus. The left gastric artery is divided with a white cartridge linear stapler. Attention is then turned toward the greater curvature

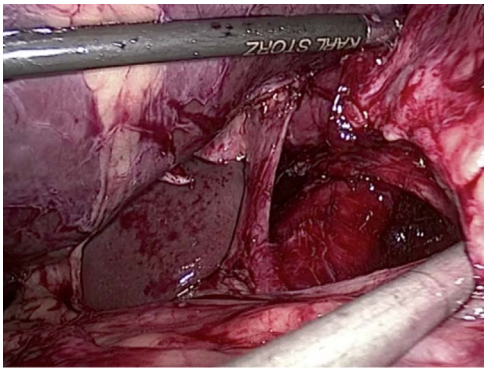

Fig. 1. Dissection through pars flaccida and exposure of the right and left crus.