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Original article

Gastric sleeve leak: a single institution's experience with early combined laparoendoscopic management

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Abstract

Background: Sleeve gastrectomy is an effective weight loss procedure that is technically less complex than Roux-en-Y gastric bypass. However, staple line leak (SLL) remains a significant complication of this procedure with reported incidence ranging from 1%–7%. Multiple treatment strategies for SLL are reported including surgical re-exploration, percutaneous drainage, and endoscopic stenting. Our objective was to review the results of our experience with combined laparoendoscopic procedures in managing SLL.

Methods: A retrospective review of patients with SLL after laparoscopic sleeve gastrectomy (LSG) between June 2008 and October 2013 was performed. Patient characteristics, operative details, and postoperative management strategies were reviewed. All patients were managed with a combination of early laparoscopic washout and endoscopic stenting.

Results: One hundred sixty-five patients underwent LSG with SLL identified in 4 patients (2.4%). One patient was transferred from an outside institution for SLL. Average time to SLL diagnosis was postoperative day 3 (range 1–7). After diagnosis patients underwent laparoscopic washout and initial endoscopic stenting. Three patients required additional endoscopic procedures to manage stent migration, and 2 required additional procedures for peri-stent leak. Complications were managed endoscopically with stent adjustment or replacement. Patients had indwelling stents for an average of 29 days (range 15–56). Mean hospital length of stay was 30 days (range 20–42).

Conclusion: SLL after LSG can confer a high morbidity and mortality. Endoscopic management of SLL with stenting has been advocated because it successfully manages the leaks and avoids additional invasive procedures. Based on our experience, successful management of SLL can be achieved with an early combined laparoendoscopic approach. (Surg Obes Relat Dis 2015;11: 60–64.) © 2015 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Sleeve gastrectomy; Leak; Endoscopic stent

Laparoscopic sleeve gastrectomy (LSG) is an accepted primary procedure for the treatment of morbid obesity based on a recent position statement from the American Society for Metabolic and Bariatric Surgery [1]. Based on the analysis of multiple large published randomized controlled trials, LSG demonstrated overall safety and clinical efficacy comparable to Roux-en-Y gastric bypass and laparoscopic adjustable gastric banding [1]. As a surgical procedure, LSG is generally considered to be less technically challenging than Roux-en-Y gastric bypass because it does not require enteric diversion and anastomosis [2]. The procedure requires mobilizing and tubularizing the stomach by stapling along the gastric axis longitudinally, paralleling the lesser curvature and leaving the native conduit in continuity. Although LSG may be a technically less challenging procedure, the long discontinuous staple line is an area at

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risk for tissue breakdown and leak. In the literature, the reported incidence of staple line leak (SLL) ranges between 1% and 7 % [2]. Although this leak rate is considered to be acceptable for the procedure, and in line with mid-term reports of gastric bypass leaks, the associated morbidity and mortality of a patient who develops SLL can be significant. For the patient who develops SLL, several treatment strategies have been described in the literature including surgical re-exploration, percutaneous drainage, and endoscopic stenting [3–6]. Our objective was to review the results of our experience with an early combined laparoendoscopic management strategy to control SLL.

Methods

Using our institutional database, a retrospective review was conducted of all patients undergoing LSG and all patients transferred to our institution for management of complications from LSG. Charts were reviewed and any postoperative complications recorded. Patients were included if they were diagnosed with SLL or if they were transferred from an outside institution for management of LSG postoperative complications and found to have SLL. SLL was diagnosed based on suspicious clinical exam findings including fever, tachycardia, increased pain, or hypotension on presentation. The diagnosis was confirmed by abdominal computed tomography (CT) with oral contrast. Early diagnosis was based on a high index of suspicion and low threshold to study these patients in the early postoperative period.

Preoperative information including age, gender, body mass index (BMI), medical co-morbidities, and American Society of Anesthesiologist (ASA) class was recorded for each patient. Surgical details including operative technique, stapler load, stapler load reinforcement, and surgical complications were recorded. Postoperative details including time to leak diagnosis, leak management strategy, endoscopic stent type and duration, number of interventions, hospital length of stay, and long-term complications were included for analysis.

Study population

Between June 2008 and October 2013, 165 patients underwent LSG at our institution for a diagnosis of morbid obesity. From this group, 4 patients were diagnosed with SLL after LSG. One patient was transferred from an outside institution with complications after LSG and found to have intermediate SLL.

Gastric sleeve technique

When performed at our institution, all gastric sleeves were created using a multiport laparoscopic approach. After port placement and devascularization of the greater curvature of the stomach, including transection of short gastric vessels, all with an ultrasonic scalpel (Ethicon, Cincinnati, OH), an Olympus GIF-160 Gastroscope (Olympus, Center Valley, PA) was inserted and advanced into the stomach. The gastroscope was positioned along the lesser curvature of the stomach to approximate a 34 F gastric conduit. An endoscopic stapler (Ethicon) was positioned parallel to the lesser curvature, starting approximately 6-cm proximal to the pylorus, loosely abutting the intraluminal gastroscope. Multiple black, green, blue, and sometimes white endoscopic stapler cartridges (Ethicon) with bioabsorbable staple line reinforcement (GORE, Flagstaff, AZ) for black and green loads were used to create a continuous staple line to transect the stomach. After complete longitudinal transection, staple line integrity was confirmed with pneumatic leak testing of the gastric conduit, and all staple lines were confirmed to be intact before exiting the operating room.

Laparoendoscopic management strategy

After CT diagnosis of SLL, patients were transported back to the operating room for immediate laparoscopic washout, staple line examination, and drain placement. The original laparoscopic port sites were used to reaccess the abdomen. The abdomen was inspected and irrigated, and a drain placed at the discretion of the operating surgeon. Staple line disruption occurred at the angle of His (3 patients) or in the upper third of the gastric sleeve (2 patients) in our series. Disruption was confirmed with pneumatic testing during laparoscopic washout. Laparoscopic suturing was performed to reinforce the staple line in 2 patients before endoscopic stenting. Laparoscopic washout was followed by endoscopic stenting, performed either during the initial reoperation (3 patients) or on the next day (2 patients). Our preference is to perform intraoperative stenting, but this capability was not universally available because of staffing issues. Fluoroscopy was used to transfer landmarks onto the external abdominal wall to facilitate positioning of the stent with appropriate proximal and distal coverage. Under direct endoscopic visualization a 18–25 mm diameter covered endoscopic stent, WallFlex (Boston Scientific, Natick, MA) or AliMAXX-ES (Merit Medical, South Jordan, UT), was placed to traverse and fully occlude the SLL. Water-soluble contrast study under fluoroscopy was then performed to confirm appropriate stent placement (Fig. 1).

Postoperatively, patients were monitored closely for clinical deterioration and for evidence of stent malfunction. Repeat endoscopy was performed in any patients with clinical concern for stent failure, and the initial stent was repositioned or replaced as indicated. Patients were initially managed in the surgical intensive care unit and then transferred to the floor once clinically stable. All patients were immediately started on broad spectrum antibiotics and an antifungal postoperatively, and this was continued while there was clinical evidence of infection. For antibiotic

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