Endoscopic management of gastroesophageal reflux disease after sleeve gastrectomy by use of the antireflux mucosectomy procedure

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Sleeve gastrectomy is the most common bariatric surgery in the United States.¹ However, studies have reported an increased rate of de novo GERD after surgery and high rates of new-onset cases of Barrett’s esophagus.²⁻⁵ Although no endoscopic procedure has been widely accepted as standard treatment of GERD, the antireflux mucosectomy (ARMS) procedure has come into the forefront in recent years. The ARMS procedure involves EMR/endoscopic submucosal dissection of the esophagogastric junction at the cardia from a retroflexed view. The presumed mechanism of efficacy is due to scar formation after healing of the mucosal defect⁶⁻⁸ and has an added advantage of leaving no prostheses in situ. To our knowledge, all prior cases have been performed in patients with normal gastric anatomy. This case report demonstrates an application of this novel ARMS technique in a sleeve gastrectomy patient with a relatively narrow stomach with altered blood supply.

CASE PRESENTATION

A 71-year-old woman who had undergone sleeve gastrectomy in 2013 and with a medical history significant for hypertension, sleep apnea, chronic obstructive pulmonary disease, and dilated cardiomyopathy presented for evaluation of worsening GERD. She had a history of GERD before her surgery, but the symptoms had not been as severe. She had daily episodes of symptoms despite lifestyle modifications, along with appropriate use of a twice-daily proton pump inhibitor. Her Gastroesophageal Reflux Disease-Questionnaire (GERD-Q) score⁹ was 11, indicative of 89% likelihood of GERD. She underwent a 24-hour pH and impedance test in 2015, which showed an increase in acid reflux in the upright position, with a DeMeester Score of 17.7. Although there was a normal number of non-acid reflux events, these correlated with her symptom of regurgitation. Given that she was not a candidate for surgical

Figure 1. Pulsed argon plasma coagulation marks the 85% circumferential area of mucosa to be treated and the 15% of the circumference to be left untreated.

Figure 2. Gastroesophageal junction (A) after 2 EMR procedures and (B) after 8 EMR procedures.
conversion to a Roux-en-Y gastric bypass because of other medical comorbidities, the decision was made to pursue an endoscopic ARMS procedure.

The endoscopic ARMS procedure was performed in the following steps (Video 1, available online at www.VideoGIE.org):

1. Argon plasma coagulation was used to mark an 85% circumferential mucosal area of the gastric cardia to be treated (Fig. 1). In other words, 15% of the circumference around the cardia on the greater curvature side of the sleeve was left untreated to preserve a sharp mucosal valve at the gastric cardia. There is currently no consensus on the exact percentage of cardia to avoid. However, given the risk of stricture formation with a full circumferential technique, we avoided a minimum of 15% as a safe amount to protect against stricture formation.

2. Normal saline solution mixed with methylene blue and epinephrine was used to provide submucosal lift.

3. EMR was performed with either a band EMR kit or a cap EMR kit with a snare and injection needle. A total of 10 resections were performed in a partially circumferential fashion (Figs. 2-4).

4. Prophylactic hemostasis of the vessels in the muscularis propria layer was performed with a coagulation grasper.

In follow-up care, the patient was discharged home on the same day and advised to follow a 72-hour liquid diet, then a 2-week soft diet before advancing as tolerated. At her 3-month follow-up visit, a barium swallow showed normal results (Fig. 5), repeat EGD showed a well-healed gastroesophageal junction (Fig. 6), and her GERDQ score had improved to 8 and showed specific improvements in sensation of heartburn, regurgitation, and need for over-the-counter medications. At her 7-month follow-up visit, the results of repeat 24-hour pH and impedance testing

Figure 3. Retroflexed view after the completion of 10 resections.

Figure 4. Retroflexed view after the completion of 10 resections, highlighting partial circumferential resection.

Figure 5. Timed barium swallow performed 3 months after ARMS with normal esophageal caliber, contour, distensibility, and prompt passage of contrast material.
were notable for no increase in acid reflux, with a normal DeMeester score of 5.8. There was no increase in total acid or non-acid reflux events.

In conclusion, ARMS may provide a safe and effective means for symptomatic acid reflux control for patients with a prior sleeve gastrectomy and medically refractory GERD who are not candidates for conversion to Roux-en-Y gastric bypass.

DISCLOSURE

Dr Thompson is a consultant for Boston Scientific, Olympus, and Apollo Endosurgery. The other authors disclosed no financial relationships relevant to this publication.

Abbreviations: ARMS, antireflux mucosectomy; GERD-Q, Gastroesophageal Reflux Disease-Questionnaire.

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Figure 6. Follow-up EGD at 3 months, with the gastroesophageal junction in (A) forward view and (B) retroflexed view.

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