Endoscopic gastric plication for the treatment of GERD and underlying class I obesity

Pichamol Jirapinyo, MD, MPH,[1,2] Christopher C. Thompson, MD, MSc[1,2]

GERD is a common gastrointestinal disorder that affects approximately 25% of the U.S. population.[1] Several studies have demonstrated a higher prevalence of GERD in patients with obesity compared to those with a normal body mass index (BMI).[2] Specifically, a gain of at least 3.5 kg/m^2 in BMI is associated with a 3-fold increase in rates of GERD compared with those with a stable BMI.[3] Potential mechanisms include an increase in intragastric pressure, transient relaxations of the lower esophageal sphincter, prevalence of hiatal hernia, esophageal dysmotility, and a decrease in lower esophageal sphincter pressure in patients with obesity.[4-7]

Approximately 30% of patients with GERD are refractory to proton pump inhibitors and may benefit from surgical fundoplication.[8] Nevertheless, the long-term efficacy of fundoplication is suboptimal in patients with obesity, with a recurrence rate of 31% compared with 4.5% in those with a normal BMI.[9] Furthermore, sleeve gastrectomy, which is the most common bariatric surgery, is a reflux-inducing procedure, and gastric bypass is rarely performed in patients with class I obesity.[10-12] Therefore, management of refractory GERD in this population remains challenging.

In this video (Video 1, available online at www.giejournal.org), we demonstrate a novel use for endoscopic gastric plication to treat GERD and class I obesity in a single session.

The device is cleared by the Food and Drug Administration for general tissue approximation. It consists of a 54F flexible endoscope with 4 working channels that accommodate an ultrathin endoscope, a helix, and a tissue approximation instrument (Fig. 1).

The first part of the procedure focuses on the antireflux component (Fig. 2). This step is performed in a retroflexed fashion. The device is used to place plications at the gastroesophageal (GE) junction 270 degrees around the cardia (Fig. 3). This helps tighten the GE junction and elongate the intra-abdominal esophagus. Once the antireflux part is completed, the device is unretroflexed to perform the bariatric component of the procedure (Fig. 4). For this step, plications are placed in the gastric body sparing the fundus.[13] Specifically, a belt-and-suspenders plication pattern is used with the belt plications reducing the width (Fig. 5) and the suspender plications reducing the length of the stomach (Fig. 6). The longitudinal plications in the body pull the GE junction distally, further reinforcing the antireflux effect.

In this case, the GE junction was pulled down by 4 cm and the gastric body was shortened by 12 cm. Real-time esophageal function test showed that the distensibility index at the GE junction decreased from 7 to 3 mm^2/mm Hg and the high-pressure zone was lengthened by 2 to 3 cm.

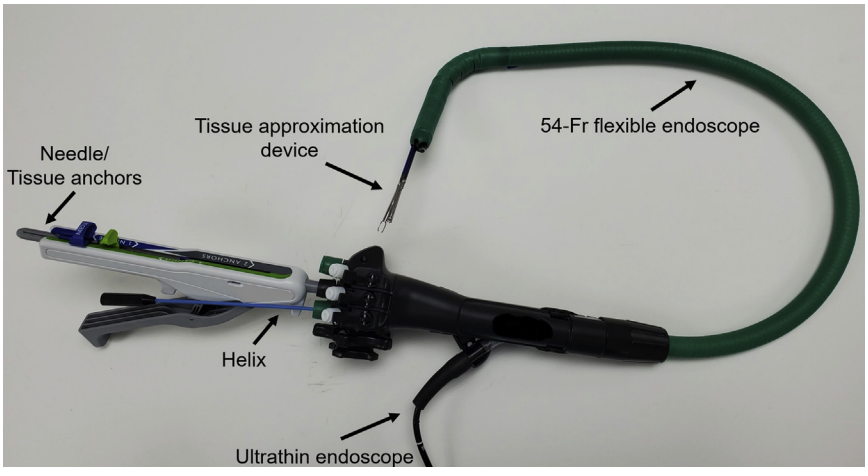

Figure 1. Incisionless operating platform.

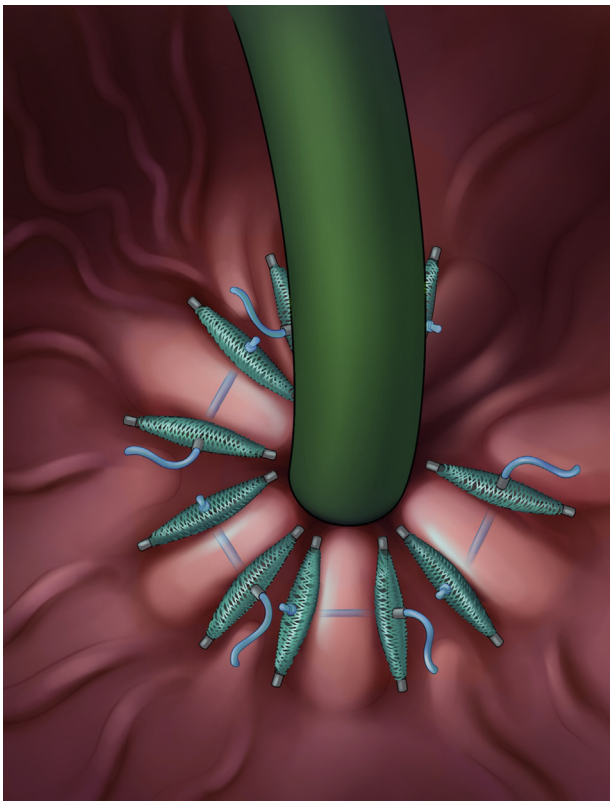

Figure 2. Part I: endoscopic antireflux procedure (retroflexed view). Gastric plications are placed at the gastroesophageal junction around the cardia to lengthen and tighten the intra-abdominal esophagus.

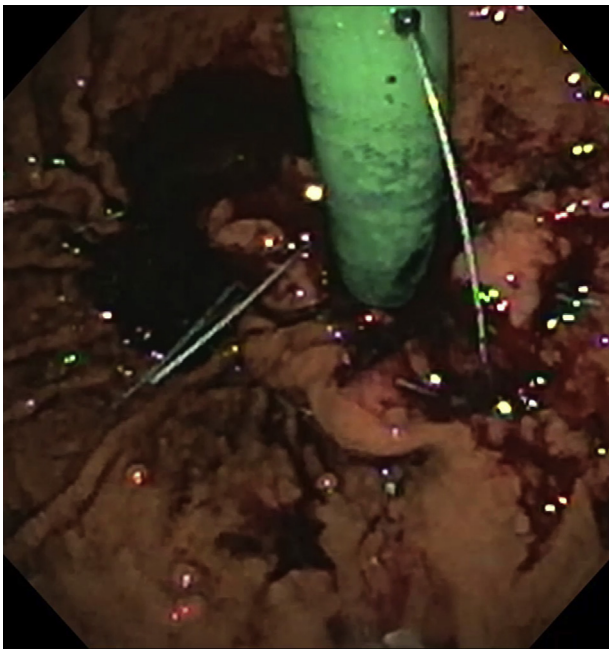

Figure 3. Part I: endoscopic antireflux procedure (retroflexed view). Gastric plications are placed at the gastroesophageal junction around the cardia to lengthen and tighten the intraabdominal esophagus.

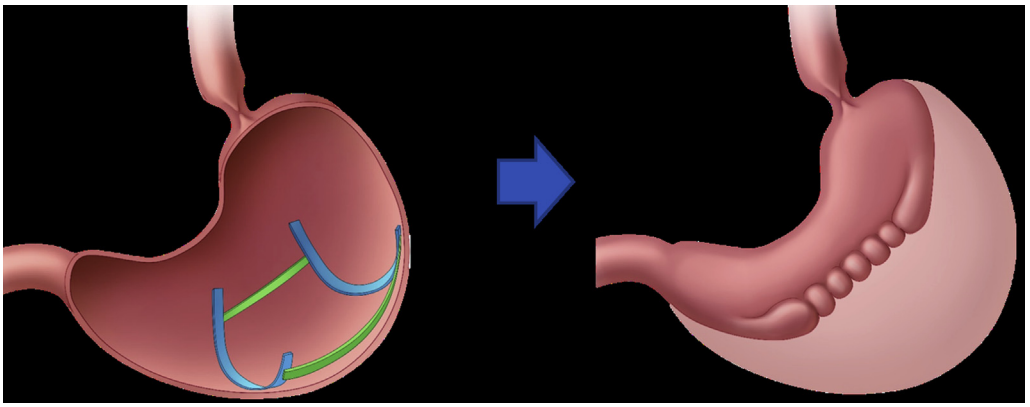

Figure 4. Part II: endoscopic bariatric procedure (anteroposterior view). Gastric plications are placed in the gastric body via a belt-and-suspenders approach. *Blue lines* show the location of belt plications, which reduce the width of the stomach. *Green lines* show the location of suspender plications, which reduce the length of the stomach.

At 6 months, the patient reported complete resolution of reflux symptoms off proton pump inhibitor and required no other antireflux medications. She also experienced a 15.8% total weight loss with a 5-point decrease in BMI. At 12 months, she remained asymptomatic from an acid reflux standpoint. Because the patient lived out of state and the follow-up visit was conducted virtually, an accurate weight could not be obtained at this visit. Nevertheless, she reported that her weight was likely stable.

In conclusion, this video demonstrates successful single-session endoscopic gastric plication to treat GERD with underlying class I obesity. Further study to assess long-term outcomes and objective data is warranted.

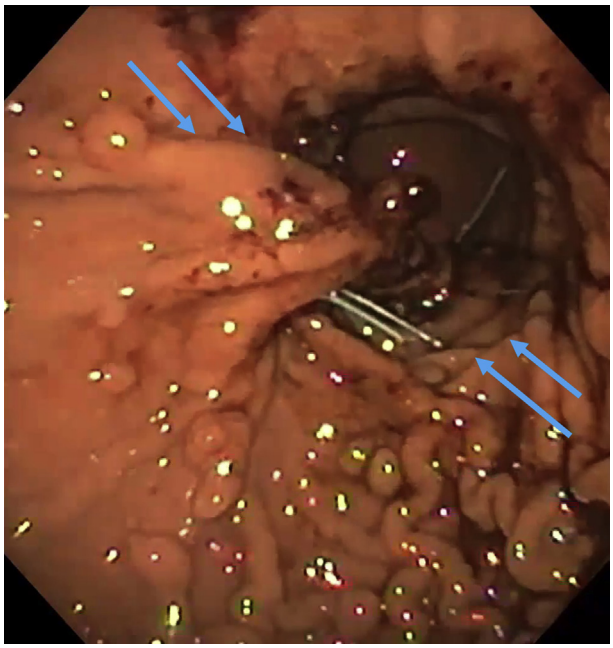

Figure 5. Belt plications are placed perpendicular to the gastric length to narrow the stomach.

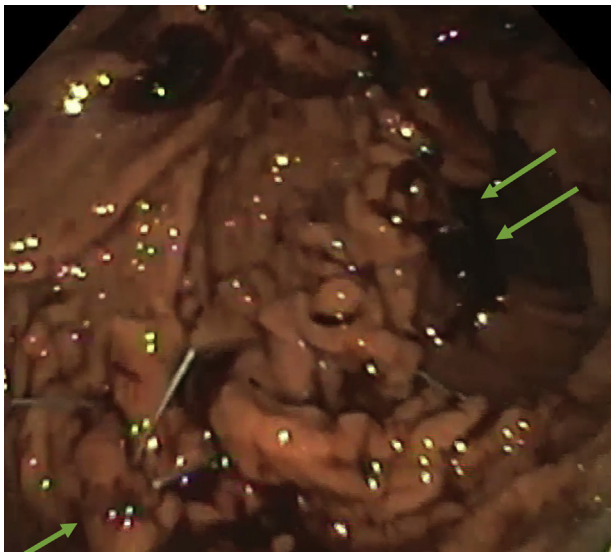

Figure 6. Suspenders plications are placed parallel to the gastric length to shorten the stomach.

DISCLOSURE

Dr Jirapinyo reports research support from Apollo Endosurgery, Fractyl, and GI Dynamics and is a consultant for Endogastric Solutons and GI Dynamics. Dr Thompson reports research support from Apollo Endosurgery, USGI Medical, Olympus/Spiration, GI Dynamics, Aspire Bariatrics, and Spatz; is a consultant for Apollo Endosurgery, USGI Medical, Fractyl, Boston Scientific, Medtronic/Covidien, Olympus/Spiration, and GI Dynamics; is a general partner at Blueframe Healthcare; and has ownership interest in GI Windows.

Abbreviations: BMI, body mass index; GE, gastroesophageal.

REFERENCES

1. El-Serag HB, Sweet S, Winchester CC, et al. Update on the epidemiology of gastro-oesophageal reflux disease: a systematic review. Gut 2014;63:871-80.
2. Corley DA, Kubo A, Zhao W. Abdominal obesity, ethnicity and gastro-oesophageal reflux symptoms. Gut 2007;56:756-62.
3. Nilsson M, Johnsen R, Ye W, et al. Obesity and estrogen as risk factors for gastroesophageal reflux symptoms. JAMA 2003;290:66-72.
4. Suter M, Dorta G, Giusti V, et al. Gastro-esophageal reflux and esophageal motility disorders in morbidly obese patients. Obes Surg 2004;14:959-66.
5. Kouklakis G, Moschos J, Kountouras J, et al. Relationship between obesity and gastroesoophageal reflux disease as recorded by 3-hour esophageal pH monitoring. Rom J Gastroenterol 2005;14:117-21.
6. Wu JC, Mui LM, Cheung CM, et al. Obesity is associated with increased transient lower esophageal sphincter relaxation. Gastroenterology 2007;132:883-9.
7. Lambert DM, Marceau S, Forse RA. Intra-abdominal pressure in the morbidly obese. Obes Surg 2005;15:1225-32.
8. El-Serag H, Becher A, Jones R. Systematic review: persistent reflux symptoms on proton pump inhibitor therapy in primary care and community studies. Aliment Pharmacol Ther 2010;32:720-37.
9. Perez AR, Moncure AC, Rattner DW. Obesity adversely affects the outcome of antireflux operations. Surg Endosc 2001;15:986-9.
10. Ponce J, Nguyen NT, Hutter M, et al. American Society for Metabolic and Bariatric Surgery estimation of bariatric surgery procedures in the United States, 2011-2014. Surg Obes Relat Dis 2015;11:1199-200.
11. Gu L, Chen B, Du N, et al. Relationship between bariatric surgery and gastroesophageal reflux disease: a systematic review and meta-analysis. Obes Surg 2019;29:4105-13.
12. Oor JE, Roks DJ, Unlu C, et al. Laparoscopic sleeve gastrectomy and gastroesophageal reflux disease: a systematic review and meta-analysis. Am J Surg 2016;211:250-67.
13. Jirapinyo P, Thompson CC. Gastric plications for weight loss: distal primary obesity surgery endoluminal through a belt-and-suspenders approach. VideoGIE 2018;3:296-300.

Brigham and Women's Hospital, Boston, Massachusettes (1), Harvard Medical School, Boston, Massachusettes (2).

https://doi.org/10.1016/j.vgie.2020.10.003