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# Helix tack for lumen-apposing metal stent fixation in single-session EUS-directed transgastric ERCP

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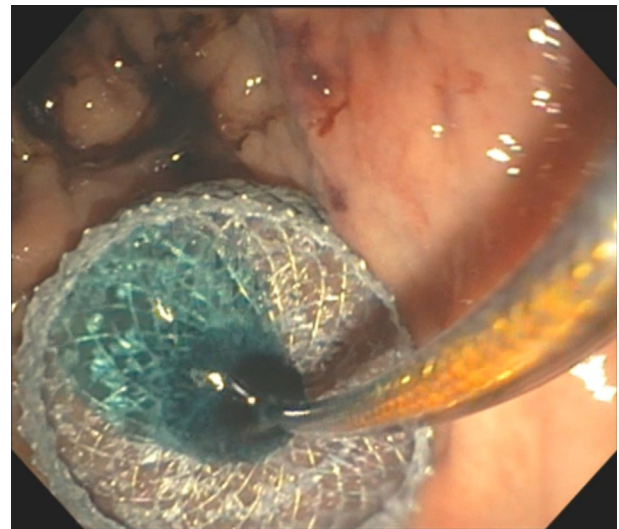
## CASE PRESENTATION

A 51-year-old man presented with acute cholecystitis and underwent a laparoscopic cholecystectomy. The patient developed a postoperative bile leak and ileus. Given his history of gastric sleeve converted to Roux-en-Y gastric bypass, he was referred to our center for double-balloon enteroscopy-assisted ERCP (DB-ERCP).

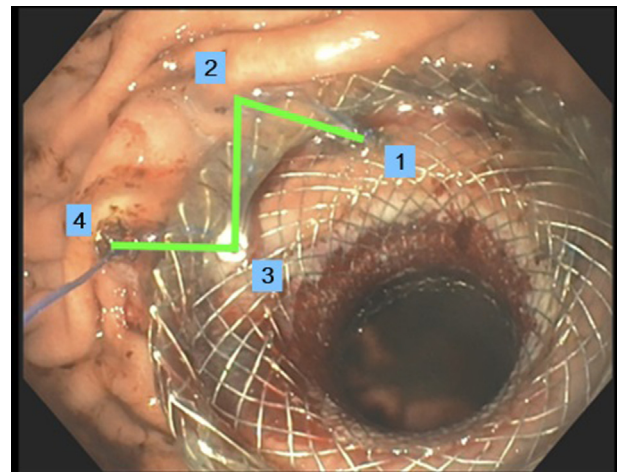
## PROCEDURE DETAILS

DB-ERCP was initially attempted and unsuccessful. This was likely because of a long Roux limb and the presence of copious enteric content from the postoperative ileus. It was therefore decided to proceed with single-session EUS-directed transgastric ERCP (SS-EDGE). Using a linear echoendoscope and a 19-gauge fine aspiration needle, we punctured and insufflated the excluded stomach with a mixture of radiocontrast and blue dye. A suitable window was identified and a gastro-gastric fistula was created freehand using a 20-mm hot AXIOS lumen-apposing metal stent (LAMS). A gush of blue dye confirmed gastro-gastric placement (Fig. 1). The proximal flange of the LAMS was fixed to the gastric wall using a helix tack suturing device (X-Tack 160-H; Apollo Endosurgery, Austin, Tex, USA). Four preloaded tacks and the cinch were deployed using the described reverse Z pattern (Figs. 2 and 3). The LAMS was subsequently dilated to 18 mm using a dilating balloon, and ERCP was performed using a duodenoscope. Given the patient's history of gastric sleeve, maneuvering of the duodenoscope through the tubular and narrow excluded stomach was particularly challenging and exerted significant pressure on the LAMS (Fig. 4). With difficulty, the duodenoscope was advanced

to the ampulla, and ERCP with sphincterotomy and placement of a plastic stent was accomplished. The patient tolerated the procedure well and was discharged. Four weeks later, on repeat ERCP, the helix tack system was found to be intact



**Figure 1.** Endoscopic image after placement of the lumen-apposing metal stent demonstrating a gush of blue dye.



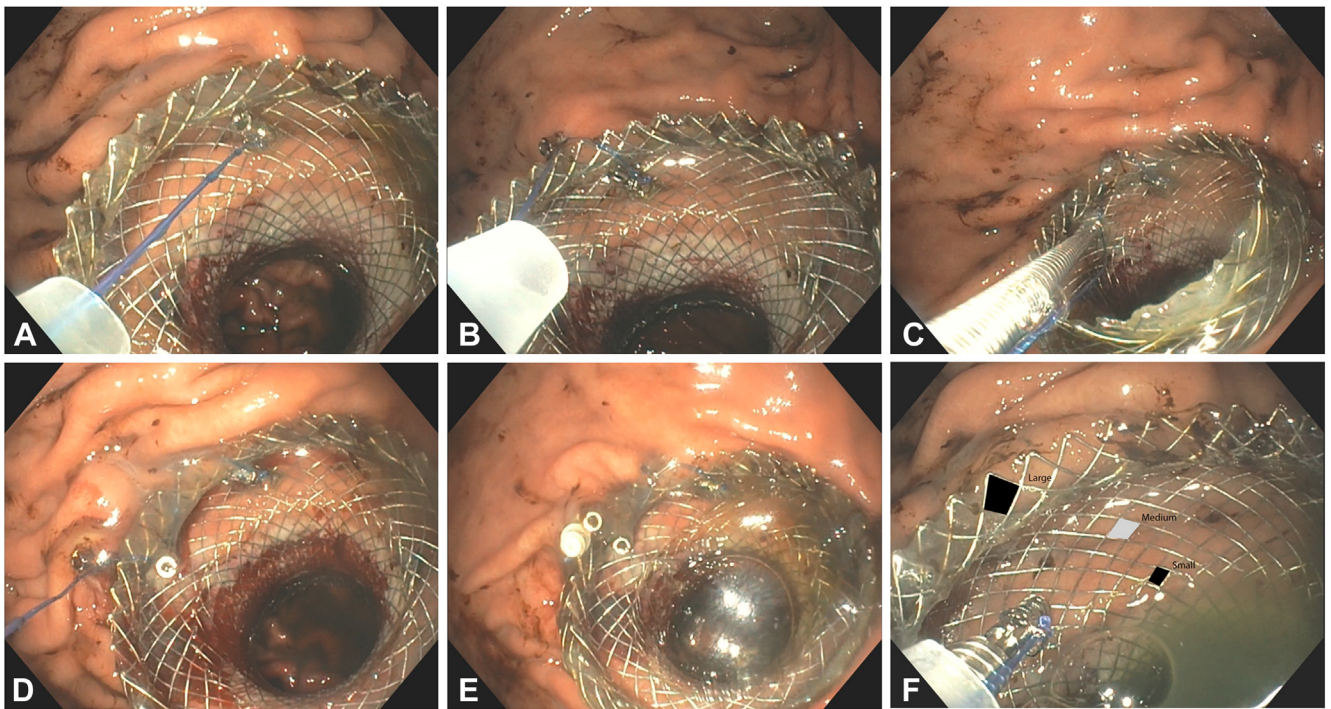
**Figure 2.** Graphical illustration of the reverse Z pattern for lumen-apposing metal stent fixation.

*Abbreviations:* DB-ERCP, double-balloon enteroscopy-assisted ERCP; LAMS, lumen-apposing metal stent; SS-EDGE, single-session EUS-directed transgastric ERCP.

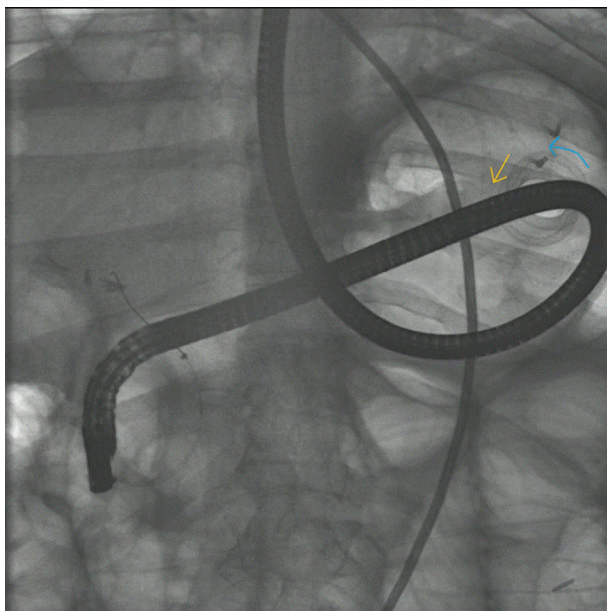
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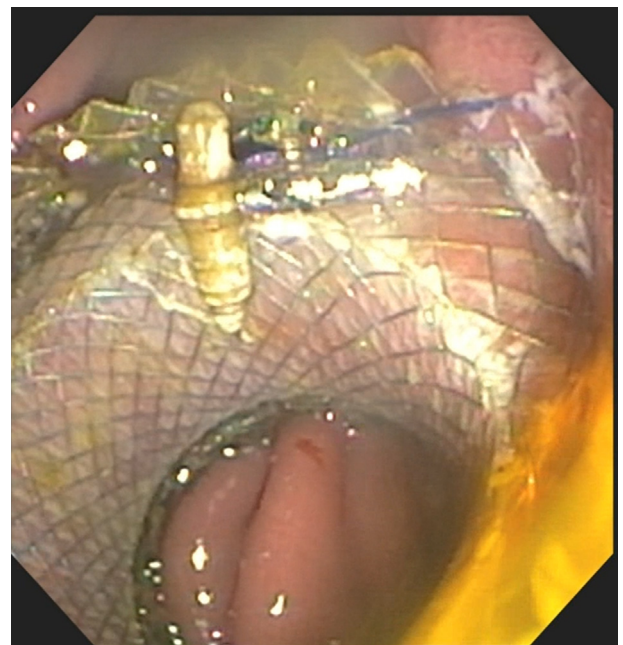
Center for Interventional Endoscopy, AdventHealth, Orlando, Florida.



**Figure 3.** Steps involved in X-Tack LAMS fixation. **A**, A medium-sized diamond is selected on the horizontal portion of the LAMS and the first tack is deployed. **B**, The second tack is deployed directly into the gastric pouch mucosa approximately 10 mm from the outer margin of the LAMS. **C**, The third tack is deployed through a diamond of the proximal flange. **D**, The fourth tack is deployed directly into the gastric pouch mucosa. **E**, A cinch is deployed. **F**, Illustration of variations in diamond size after deployment of the LAMS. The grey medium-sized diamond is optimally suited for X-Tack placement. LAMS, Lumen-apposing metal stent.



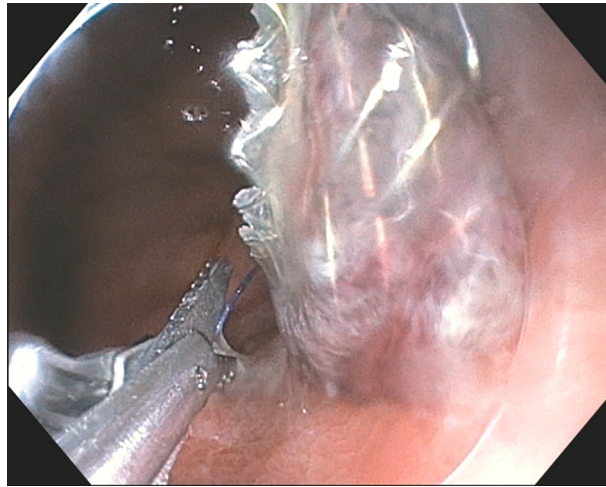
**Figure 4.** Fluoroscopy image of the duodenoscope (11.6 mm) exerting significant linear force (*yellow arrow*) and rotational torque (*blue arrow*) on the lumen-apposing metal stent.



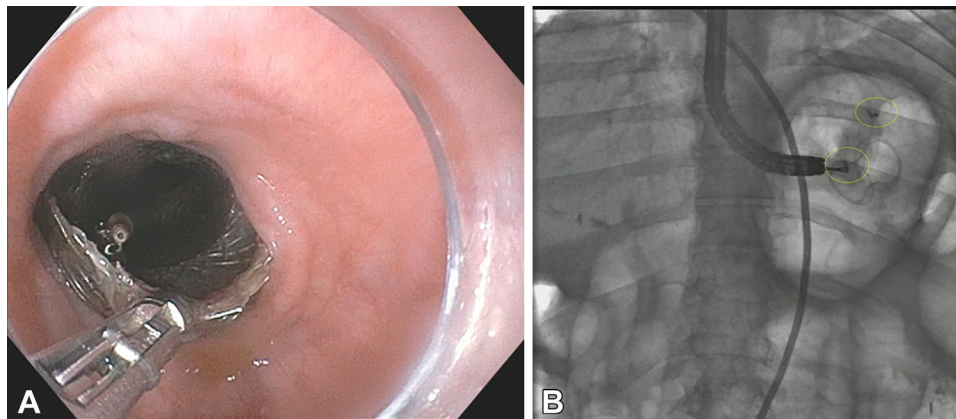
**Figure 5.** Endoscopic image of the intact helix tacks and lumen-apposing metal stent during follow-up ERCP.

and continued to anchor the proximal flange of the LAMS (Fig. 5). Repeat ERCP was performed, and the biliary stent was removed. After completion of the ERCP, the proline suture

was cut using standard endoscopic scissors (Fig. 6), and the LAMS along with the anchoring tacks were removed (Fig. 7). The patient tolerated the procedure well.



**Figure 6.** Endoscopic image of suture being cut with standard endoscopic scissors.



**Figure 7.** Endoscopic (A) and fluoroscopic (B) image showing en bloc removal of the lumen-apposing metal stent along with the 2 X-Tacks that were anchored in the proximal flange.

## DISCUSSION

SS-EDGE can be a lifesaving procedure in the right clinical setting.<sup>1,2</sup> Dislodgement of the LAMS during the ERCP and resulting perforation can be a potentially disastrous adverse event and can occur in up to 8.6% of patients.<sup>3</sup> Anchoring the LAMS with devices such as endoscopic sutures or over-the-scope clips is associated with a reduced risk of stent dislodgment and has been common clinical practice.<sup>4</sup>

## CONCLUSION

We describe the successful use of a novel device for LAMS fixation during a particularly challenging SS-EDGE in

a patient with sleeve to Roux-en-Y gastric bypass (Video 1, available online at [www.giejournal.org](http://www.giejournal.org)). Here we were able to demonstrate that the helix tack system secured the LAMS in place despite significant rotational and linear forces. Potential benefits of using the helix tack system for LAMS fixation are cost efficiency, ease of removal, and the ability to fix the distal flange on the excluded stomach side when needed.

## DISCLOSURE

*Dr Yang is a consultant for Microtech, Medtronic, Olympus, Fujifilm, and Apollo Endosurgery. Dr Arain is a consultant for Cook Medical, Merit, Boston Scientific, and Olympus. Dr Hasan is a consultant for Boston*

*Scientific and Olympus. All other authors disclosed no financial relationships.*

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