ORIGINAL ARTICLE

Successful management of a duodenal perforation using a through-the-scope suturing device after failed attempt at closure with an over-the-scope clip

Maham Hayat, MD, Kambiz Kadkhodayan, MD, Mustafa A. Arain, MD, Muhammad K. Hasan, MD, Dennis Yang, MD

INTRODUCTION

The X-Tack Endoscopic HeliX Tacking System (Apollo Endosurgery, Austin, Tex, USA) is a novel through-the-scope suture-based device approved for tissue approximation of mucosal defects. Initial case reports and case series have been encouraging on its efficacy for closure of mucosal defects.[1-3] However, this device is not intended for full-thickness closure, and there are limited data on this approach.[4,5] In this video, we present the successful use of the HeliX Tacking System for the management of a duodenal perforation after a same-session failed attempt at closure with an over-the-scope clip (OTSC).

CASE

An 80-year-old woman with advanced dementia and chronic dysphagia, with dependence on percutaneous gastrojejunostomy (PEG-J) tube for nutrition, was admitted for reports of a clogged, non-flushing J-tube, which had been initially placed 11 weeks prior. The patient had been showing increasing abdominal pain and intermittent fevers at the nursing home for the past 2 days. On presentation, the patient was hemodynamically stable and afebrile. Her complete blood count was unremarkable except for leukocytosis of 12,600/μL. A CT scan of the abdomen and pelvis was performed, which revealed inflammatory changes in the proximal duodenum and erosion of the distal end of the gastrojejunostomy tube through the wall of the duodenum and protruding slightly into the liver (Fig. 1).

On endoscopy, the tip of the J-portion of the PEG-J was seen protruding through the duodenal wall just distal to the pylorus (Fig. 2A; Video 1, available online at www.giejournal.org). Following removal of the J-tube from the duodenum, we identified a chronic fibrotic perforation 7 mm in diameter (Fig. 2B). Based on the size and location of the defect, we decided to proceed with closure with an OTSC (Padlock clip; Steris, Mentor, Ohio, USA). However, the friable and fibrotic nature of the perforation prevented adequate apposition of the defect into the OTSC cap, despite several efforts using both suctioning and a grasping forceps (OTSC Twin Grasper; Ovesco, Cary, NC, USA) (Fig. 3). The OTSC was removed, and we proceeded to close the perforation with the through-the-scope suturing device (X-Tack HeliX Tacking System). The first tack was advanced firmly into the healthy tissue approximately 5 mm from the edge of the defect. Prior to deployment, the tack was deeply anchored into the tissue by activating the Persian-drill style handle drive with 1 to 2 additional clockwise turns of the handle, to ensure that the barbs and flat driving tip were completely embedded.[5] Following this, the remaining 3 tacks were sequentially placed on the healthy tissue adjacent to the defect using a purse-string configuration (Fig. 4A). After placement of all tacks, final tension was applied to the suture and the cinch released with the suture cutter (Fig. 4B). Adequate closure of the defect was confirmed by the absence of contrast

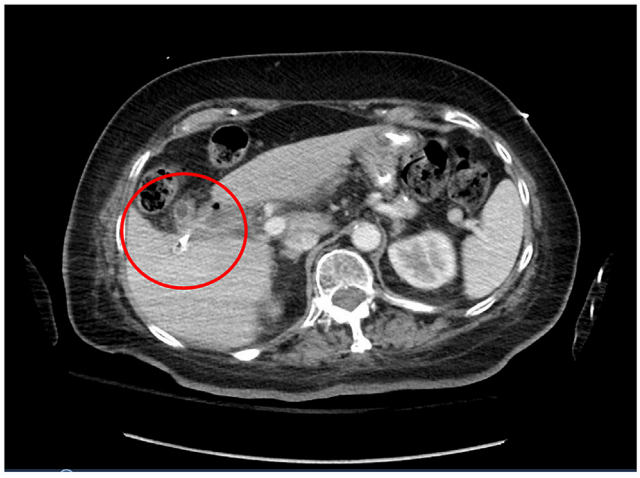

Figure 1. CT scan of the abdomen and pelvis showing erosion of the distal end of the gastrojejunostomy tube through the duodenal wall.

Abbreviations: OTSC, over-the-scope clip; PEG-J, percutaneous gastrojejunostomy tube.

2468-4481
https://doi.org/10.1016/j.vgie.2022.10.011

Center for Interventional Endoscopy, AdventHealth, Orlando, Florida.

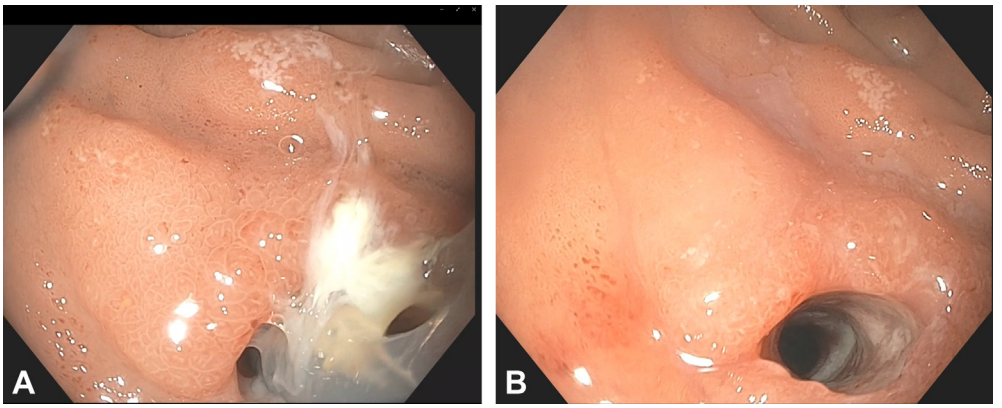

Figure 2. A, Endoscopic view of the gastrojejunostomy tube eroding through the duodenal wall immediately beyond the pylorus. **B,** Endoscopic view of the perforation following removal of the gastrojejunostomy tube.

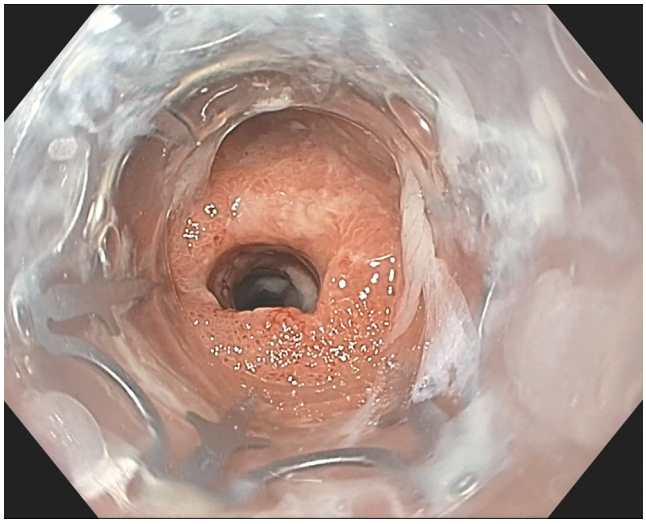

Figure 3. Failed attempt to close the perforation with an over-the-scope clip because of the fibrotic and friable nature of the defect.

extravasation with intraluminal injection under fluoroscopy (Fig. 5). The gastrojejunostomy tube was subsequently repositioned endoscopically with fluoroscopic assistance. The patient was able to resume feeding and she was discharged without any postprocedural adverse events. The patient did not endorse any symptoms or additional issues with the PEG-J at her routine follow-up 6 weeks after hospitalization.

CONCLUSION

In this case report, we demonstrate how the novel HeliX Tacking System allowed successful closure of a chronic perforation after failed OTSC. The through-the-scope design permitted easy maneuvering in an otherwise unstable position immediately beyond the pylorus, which would have posed a significant challenge with other endoscopic modalities. Nonetheless, it should be noted that long-

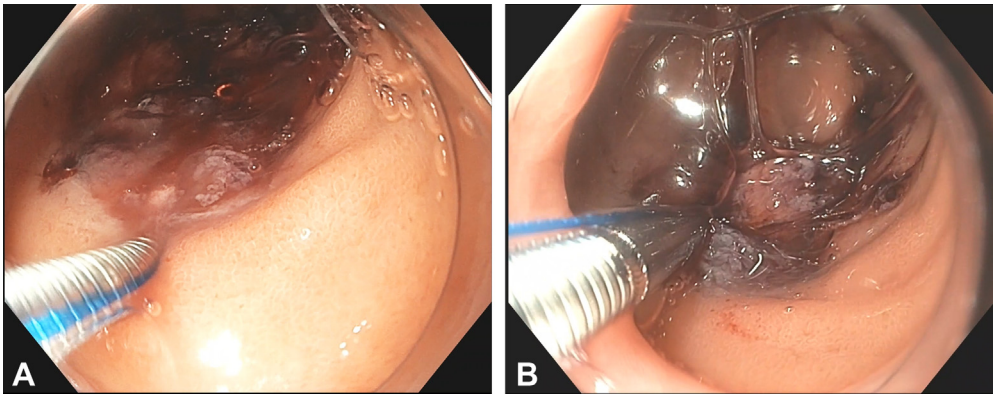

Figure 4. Helix tacking system. **A,** Advancement of the tack firmly into the healthy tissue approximately 5 mm from the edge of the defect. **B,** Tension is applied to the suture and the cinch before final release.

Figure 5. Contrast administration under fluoroscopy did not show any extravasation consistent with adequate endoscopic closure.

term closure of chronic, fibrotic, full-thickness defects can be challenging, irrespective of the endoscopic approach. Future larger longitudinal prospective studies are needed to evaluate the safety, efficacy, and durability of this device for the management of full-thickness defects.

DISCLOSURE

Dr Arain is a consultant for Boston Scientific, Olympus, Cook Medical, and Medtronic. Dr Hasan is a consultant for Boston Scientific and Olympus. Dr Yang is a consultant for Olympus, Fujifilm, Apollo Endosurgery, Medtronic, and Microtech. All other authors disclosed no financial relationships.

REFERENCES

1. Zhang LY, Bejjani M, Ghandour B, et al. Endoscopic through-the-scope suturing. VideoGIE 2021;7:46-51.
2. McCarty TR, Aihara H. Hybrid endoscopic submucosal dissection with novel helix tacking system for defect closure. VideoGIE 2021;6:446-9.
3. Mahmoud T, Wong Kee Song LM Stavropoulos SN, et al. Initial multicenter experience using a novel endoscopic tack and suture system for challenging GI defect closure and stent fixation (with video). Gastrointest Endosc 2022;95:373-82.
4. Sultan M, Romero R, Evans J, et al. Persistent gastro-cutaneous fistula closure with tack suture system in the setting of a severe esophageal stricture. VideoGIE 2022;7:205-7.
5. Zhang LY, Ghandour B, Bejjani M, et al. Endoscopic full-thickness resection with through-the-scope suture closure for gastrointestinal stromal tumor. VideoGIE 2022;7:296-8.