



Management of an iatrogenic duodenal perforation with a helical tack system in a patient with pancreatic cancer complicated by gastric outlet obstruction

Dimitri Belkin, MD,¹ Alessandro Colletta, MD,¹ Mark Hanscom, MD,² Prashanth Rau, MD,³ Sanjay Rau, DO,⁴ Neil B. Marya, MD⁵

INTRODUCTION

Although endoscopic procedures are safe, they carry a risk of perforation, which can manifest severe adverse events for patients if not managed expediently. Endoscopic methods of closure include clips, injectable agents, and suturing devices.^{1,2} Occasionally, perforations occur in difficult locations. Recently, a through-the-scope tacking system, X-tack Endoscopic Helix Tacking System 160 cm (HTS) (Apollo Endosurgery Inc, Austin, Tex, USA), has been made available for mucosal defect closure, providing endoscopists with another tool to manage adverse events.^{3,4} There is emerging evidence for the use of the X-tack system in accomplishing closure of full-thickness defects.⁵ Here, we demonstrate the use of the HTS for management of a duodenal perforation during endosonographic evaluation of a pancreatic mass. The repair using the HTS was durable and

allowed for EUS-guided choledochoduodenostomy (EUS-CD) to be performed.

CASE

A 58-year-old man without significant medical history presented with jaundice. Cross-sectional imaging demonstrated a 3-cm pancreatic head mass causing biliary dilation (Fig. 1). EUS revealed a gastric outlet obstruction (GOO) because of severe extrinsic duodenal stenosis from the mass. A fine-needle biopsy was diagnostic for pancreatic ductal adenocarcinoma; however, during the examination, an iatrogenic tear proximal to the GOO occurred. Because the perforation occurred close to the duodenal stenosis in the region of the duodenal sweep, the endoscopist decided that optimal defect closure would be achieved using the HTS. Four tacks connected by a 3.0 polypropylene suture were placed in a Z pattern across the defect (Fig. 2). Contrast was subsequently injected, which confirmed defect closure as there was no evidence of a persistent leak (Fig. 3). To reinforce closure, an 18- × 140-mm esophageal covered metal stent was placed across the stenosis and sutured in place with an over-the-scope suturing device. Given the events, ERCP and biliary decompression were deferred to a future endoscopy. At completion of the procedure, a GI



Figure 1. A CT scan of the abdomen and pelvis showing pancreatic head adenocarcinoma causing extrinsic duodenal compression.

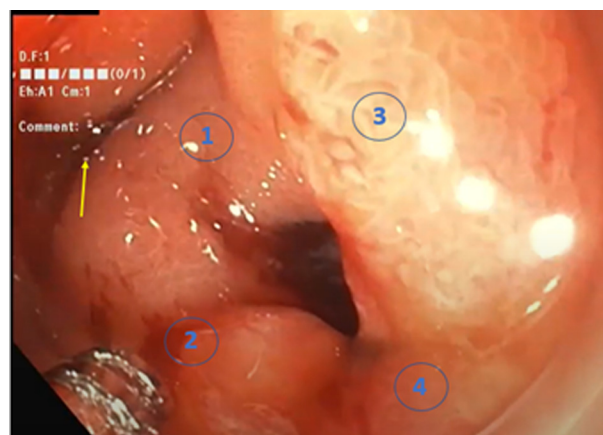


Figure 2. Endoscopic image showing perforation, with stenosed lumen at the top left (yellow arrow). Tack placement locations identified by circled numbers, in order of placement.



Figure 3. Intraprocedure fluoroscopy after helical tack system deployment shows no contrast extravasation and confirms lack of a persistent leak.

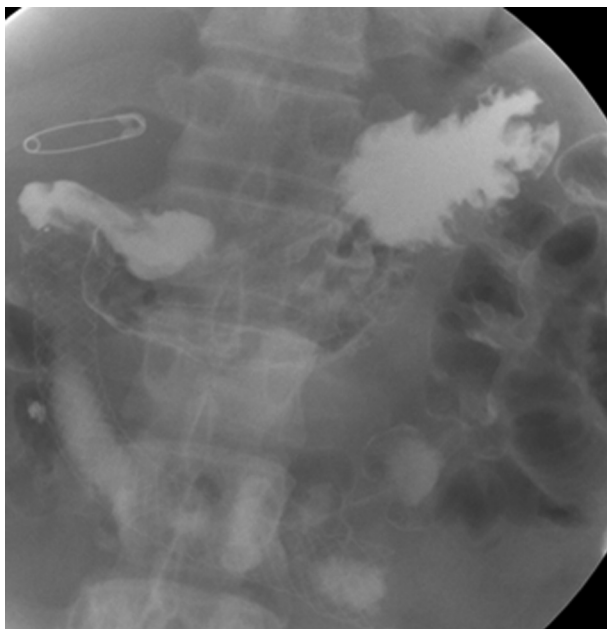


Figure 4. Upper GI series demonstrating no leakage of the contrast medium in the duodenum postoperatively.

fluoroscopic series demonstrated no extravasation of contrast. Closure was also confirmed on subsequent upper GI series and a CT scan of the abdomen (Figs. 4 and 5). Total procedural time was 2 hours. The patient was maintained at nothing-by-mouth with a nasogastric tube to intermittent suction for 5 days, and he then resumed a clear liquid diet and advanced to a mechanical soft diet the following day.

Endoscopy was repeated 2 weeks later. The tack system was identified and no signs of perforation were observed.



Figure 5. A CT scan of the abdomen and pelvis with gastrografin demonstrating no leakage of the contrast medium in the duodenum postoperatively.

The previously placed duodenal stent was removed, and a contrast examination again demonstrated no evidence of a perforation. Because the duodenal stenosis was still not traversable, ERCP was deferred. To achieve biliary decompression, an EUS-CD was performed using a 6- × 8-mm lumen-apposing metal stent (AXIOS; Boston Scientific, Marlborough, Mass, USA) (Video 1, available online at www.giejournal.org).

The patient continued to tolerate a diet and had resolution of jaundice. Surgical oncology performed a robot-assisted gastrojejunostomy for definitive management of GOO. He has since received neoadjuvant chemotherapy and undergone a pancreaticoduodenectomy.

CONCLUSION

Prior studies have demonstrated the utility of the HTS for management of GI perforations.^{3,4} The HTS offers a substantial advantage in closure of challenging perforation sites that can be difficult to access with other devices. In our case video, the HTS was able to successfully manage an iatrogenic perforation, allowing us to also perform EUS-CD for management of biliary obstruction. The patient has had no further adverse events related to the perforation, demonstrating the durability of the closure achieved using the HTS. In the future, studies comparing the relative efficacy of the

HTS to other devices will be needed to help endoscopists decide what situations may benefit from use of the HTS.

DISCLOSURE

Dr Marya is a consultant for Boston Scientific. All other authors disclosed no financial relationships.

Abbreviations: EUS-CD, EUS-guided choledochoduodenostomy; GOO, gastric outlet obstruction; HTS, helical tack system.

REFERENCES

1. Dorrell R, Pawa S, Zhou Y, Lalwani N, Pawa R. The diagnostic dilemma of malignant biliary strictures. *Diagnostics (Basel)* 2020;10:337.
2. Wang K, Shi J, Ye L. Endoscopic management of iatrogenic gastrointestinal perforations. *Laparoscop Endoscop Robot Surg* 2019;2:41-6.
3. Hernandez A, Marya NB, Sawas T, et al. Gastrointestinal defect closure using a novel through-the-scope helix tack and suture device compared to endoscopic clips in a survival porcine model (with video). *Endosc Int Open* 2021;9:E572-7.
4. Rau P, Hanscom M, Amin D, et al. Use of a novel helical tack system for the management of challenging upper gastrointestinal defects. *VideoGIE* 2021;7:85-8.
5. Mahmoud T, Wong K, Song LM, 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.

University of Massachusetts Chan Medical School, Worcester, Massachusetts (1), Mayo Clinic, Rochester, Minnesota (2), University of Massachusetts Chan Medical School, Worcester, Massachusetts (3), Jefferson Health Northeast, Philadelphia, Pennsylvania (4), University of Massachusetts Chan Medical School, Worcester, Massachusetts (5).

Copyright © 2023 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.vgje.2022.11.014>

Endoscopypedia

Endoscopypedia has a new look! Check out the redesign of the official blog of *GIE* and *VideoGIE*. Keep up with the latest news and article discussions and post your comments or questions to *VideoGIE* authors. Visit us at www.endoscopypedia.com.