



Every trick in the book: EUS angiotherapy for management of refractory bleeding secondary to a complicated duodenal ulcer in a patient with Roux-en-Y gastric bypass

Neil B. Marya, MD, Tarek Sawas, MD, Vinay Chandrasekhara, MD, Veeravich Jaruvongvanich, MD, Daniel Maselli, MD, Michael J. Levy, MD, Reem Matar, Andrew C. Storm, MD, Barham K. Abu Dayyeh, MD, MPH, FASGE

A 76-year-old man with a history of Roux-en-Y gastric bypass (RYGB) and a prior perforated duodenal ulcer presented to our emergency department with melena. An urgent EGD did not identify a source of bleeding in the esophagus, gastric pouch, gastrojejunostomy, or examined portion of the Roux limb.

Five months later, the patient came back to our emergency department with recurrent GI bleeding and abdominal pain. A CT scan revealed a duodenal perforation (Fig. 1). The patient subsequently underwent an emergent exploratory laparotomy with a Graham patch for closure.

Four months after surgery, the patient returned again with recurrent bleeding. An urgent endoscopy identified a blood clot emanating from the pancreaticobiliary limb (Fig. 2), and a subsequent CT angiography demonstrated hyperdense material in the excluded stomach concerning for a blood clot. Thus, the decision was made to access the gastric remnant.

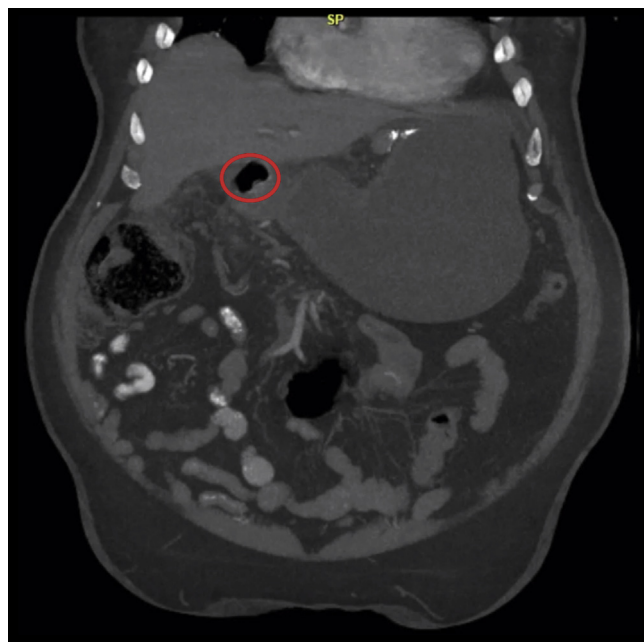


Figure 1. CT scan demonstrating the presence of a perforation at the duodenal apex (red circle) in a patient with Roux-en-Y gastric bypass anatomy.

PROCEDURE

Under EUS guidance, the excluded stomach was accessed from the gastric pouch and expanded with normal saline solution and contrast. A 15- × 10-mm lumen-apposing metal stent (LAMS) was used to create a conduit to the excluded stomach (Fig. 3). The LAMS was sutured in place to avoid displacement and was then dilated.

Once across the LAMS, the endoscope identified an actively bleeding duodenal ulcer. The area was injected with dilute epinephrine (Fig. 4), and 2 hemostatic clips were placed. Additionally, a 20- × 60-mm fully covered metal stent was placed in the duodenum for tamponade (Fig. 5).

After our procedure, a mesenteric angiography was performed for management of a suspected pseudoaneurysm of the gastroduodenal artery (GDA). Despite multiple attempts at selecting the GDA, the interventional radiologists were unable to perform hemostasis maneuvers. After the interventional radiology procedure, the patient had persistent bleeding. Surgery was consulted, but after reviewing the case the team noted the patient was a poor surgical candidate. Thus, the gastroenterology service was again consulted for another attempt at hemostasis.

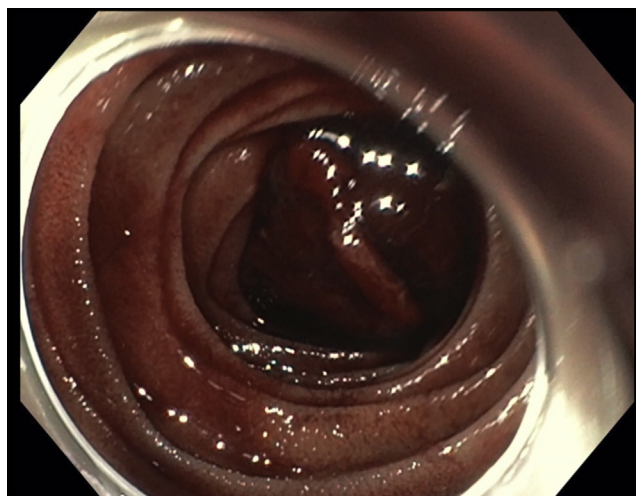


Figure 2. Endoscopic image demonstrating the presence of a large blood clot emanating from the pancreaticobiliary limb in a patient with Roux-en-Y gastric bypass anatomy.

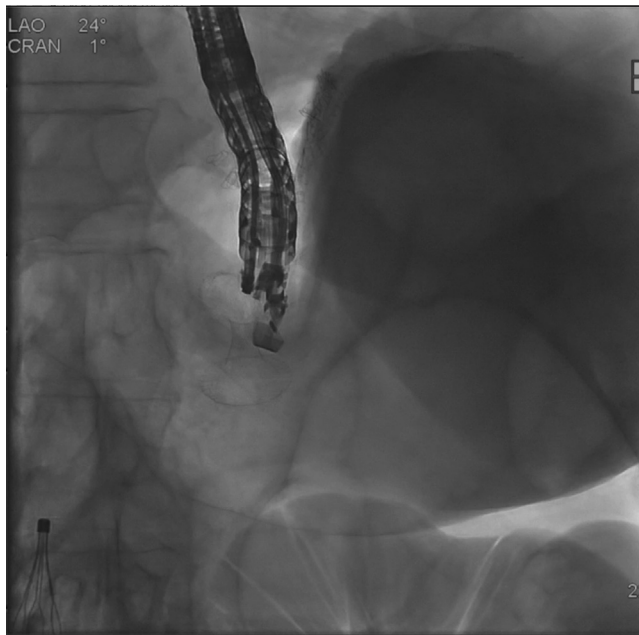


Figure 3. Fluoroscopic images of placement of a lumen-apposing metal stent from the blind limb of the gastrojejunostomy to the excluded stomach.

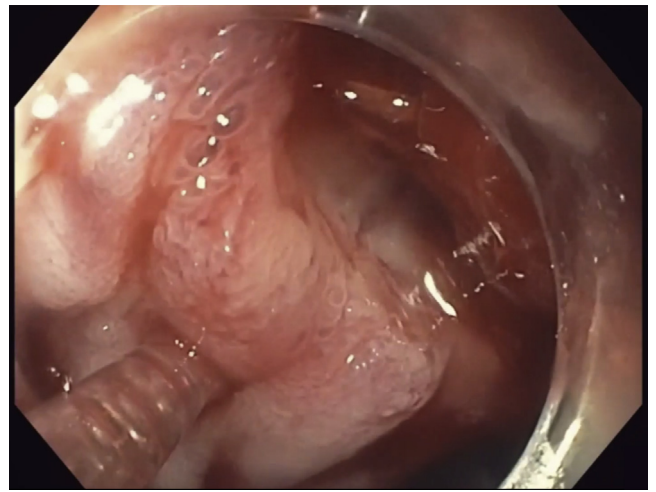


Figure 4. Endoscopic image of directed injection of dilute epinephrine into the base of an actively bleeding duodenal ulcer.

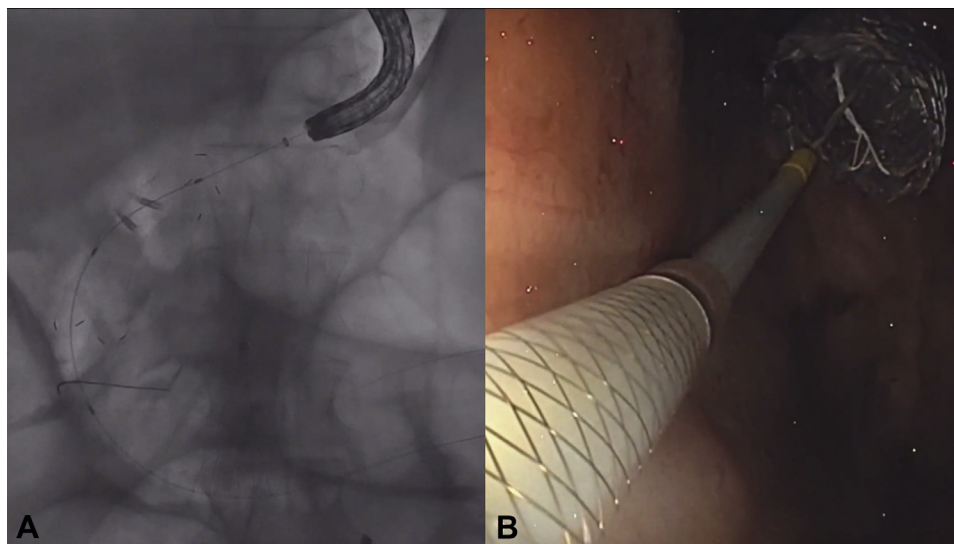


Figure 5. Fluoroscopic (A) and endoscopic (B) images of deployment of a fully covered metal stent in the excluded duodenum for an attempt at hemostasis.

An endoscope was advanced to the duodenum, and the recently placed fully covered metal stent was removed. An endosonoscope then was advanced to the duodenum. With great difficulty, an artery was sonographically identified as extending to the bed of the duodenal ulcer (Fig. 6). This was thought to be a branch of the GDA given that prior CT scan images demonstrated that the GDA was near the area of ulceration. Using a 22-gauge needle, we targeted the artery. Once access was obtained, 2 microcoils and a mixture of gelfoam and epinephrine were injected directly

into the artery, and hemostasis was achieved (Fig. 7 and Video 1, available online at www.VideoGIE.org).

OUTCOME AND DISCUSSION

Several weeks after our last intervention, the patient returned for a surveillance EGD to evaluate the duodenum. This EGD demonstrated that the patient's previous duodenal ulcer was healing. It has now been several

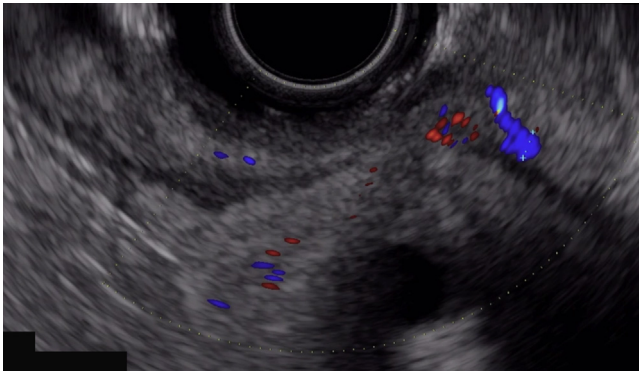


Figure 6. Sonographic identification of a 1.8-mm arterial vessel at the base of an ulcer at the duodenal apex.

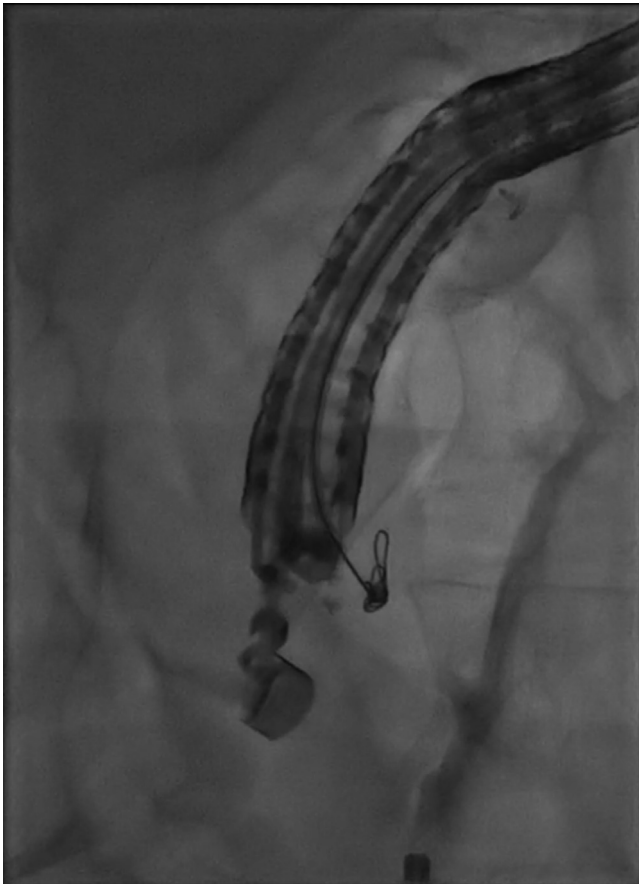


Figure 7. Fluoroscopic image of EUS-directed injection of microcoils into a branch of the gastroduodenal artery.

months since we performed EUS-guided angiotherapy for this patient, and he has had no further bleeding. Currently, the patient is on indefinite proton pump inhibitor therapy until another surveillance EGD is performed to confirm that the ulcer has completely healed. The etiology of the ulcer has not been resolved. The patient is currently avoiding all nonsteroidal anti-inflammatory drugs, is negative for *Helicobacter pylori* infection, and has biopsy specimens that have been negative for malignancy.

The increasing use of LAMSs has provided new options for endoscopists to manage patients with various clinical dilemmas despite having RYGB anatomy. Previously, the innovation of EUS-directed transgastric ERCP provided a new method to manage biliary pathology in such patients.^{1,2} More recently, Krafft et al³ reported outcomes from a case series in which interventions were performed from the excluded foregut after a LAMS had created a conduit between the gastric pouch and the remnant stomach. None of the interventions from that case series included EUS-guided angiotherapy for hemostasis.³

Our case demonstrates that even in complex cases with altered anatomy in which interventional radiology and surgery are not able to achieve hemostasis, therapeutic endoscopy may still be an option.

DISCLOSURE

Dr Chandrasekhara is a consultant for Inerpace Diagnostics and a shareholder of Nevakar Corporation. Dr Storm is a consultant for Olympus America, Boston Scientific, and Endo-TAGGS. Dr Marya was a consultant for AnX Robotica in the last two years. Dr Abu Dayyeh is a consultant for DyaMx, Metamodix, USGI, and Boston Scientific. Dr Abu Dayyeh is also on the Speakers bureau for Olympus, Medtronic, Johnson and Johnson, Endogastric solutions. Dr Abu dayyeh receives grant/research support from Apollo Endosurgery, Carin Diagnostics, Aspire, and Spatz. All other authors disclosed no financial relationships.

Abbreviations: GDA, gastroduodenal; LAMS, lumen apposing metal stent; RYGB, Roux-en-Y gastric bypass.

REFERENCES

1. Kedia P, Sharaiha RZ, Kumta NA, et al. Internal EUS-directed transgastric ERCP (EDGE): game over. *Gastroenterology* 2014;147:566-8.
2. Kedia P, Kumta NA, Widmer J, et al. Endoscopic ultrasound-directed transgastric ERCP (EDGE) for Roux-en-Y anatomy: a novel technique. *Endoscopy* 2015;47:159-63.
3. Krafft MR, Hsueh W, James TW, et al. The EDGI new take on EDGE: EUS-directed transgastric intervention (EDGI), other than ERCP, for Roux-en-Y gastric bypass anatomy: a multicenter study. *Endosc Int Open* 2019;7: E1231-40.

Division of Gastroenterology and Hepatology, Mayo Clinic, Rochester, Minnesota.

Correspondence to: Barham K. Abu Dayyeh, MD, MPH, FASGE.
E-mail: AbuDayyeh.Barham@mayo.edu.

Copyright © 2020 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.2020.05.026>