Percutaneous transcystic cholangioscopy-assisted rendezvous ERCP in a hostile abdomen

Linda Y. Zhang, MBBS,[1] Thomas M. Runge, MD,[1,2] Yervant Ichkhanian, MD,[1] Vivek Kumbhari, MD, PhD,[1] Mouen A. Khashab, MD[1]

A 74-year-old man with a history of perforated peptic ulcer disease treated with Billroth II partial gastrectomy presented with sepsis due to obstructing choledocholithiasis. He had recently undergone exploratory laparotomy and Roux-en-Y reconstruction for suspected visceral perforation, although none was identified. He was ultimately diagnosed with acute biliary peritonitis, and a percutaneous cholecystostomy (PC) tube was placed. An enteroscopy-assisted ERCP (EA-ERCP) was arranged.

At enteroscopy, the area of the papilla was reached, but the biliary orifice was not visible. Contrast injection through the PC demonstrated multiple large stones within a dilated bile duct (Fig. 1). This also confirmed that although the papilla was in close proximity, it was not accessible. The enteroscope was then removed and an EUS was performed to assess for EUS-directed drainage options; this was unsuccessful because of the distance of small-bowel loops from the remnant stomach and the lack of small-bowel distension.

After initial attempted EA-ERCP and EUS-guided approaches, alternative options including surgical intervention and a second percutaneous approach were considered. In light of the patient's "hostile" abdomen with multiple prior surgical interventions and with the benefit of an established percutaneous access, percutaneous transcystic cholangioscopy-assisted rendezvous ERCP was believed to be the most appropriate next step. The PC was confirmed to be of an appropriate size to accommodate a digital cholangioscope (minimum 10F). With the enteroscope in the proximal afferent limb, the wire was advanced through the PC into the gallbladder before the PC was removed (Fig. 2). Manipulation of the wire through the cystic duct and transpapillary into the small bowel was unsuccessful. A digital cholangioscope was then introduced percutaneously to allow identification of the cystic duct (Fig. 3) and wire passage into the cystic duct, through the bile duct, and across the papilla (Fig. 2). The enteroscope was then able to grasp the wire and retract it into the channel. Balloon sphincteroplasty over the wire was performed before the enteroscope was exchanged for an adult colonoscope (chosen because the length and diameter of the instrument channel would permit electrohydraulic lithotripsy). The digital cholangioscope was advanced into the bile duct (Fig. 4), and electrohydraulic lithotripsy was performed with excellent stone fragmentation. Because of the large amount of stone debris despite numerous sweeps with a stone extraction balloon, a 10-mm × 40-mm fully covered metal biliary stent was placed. The PC was replaced before completing the procedure. The procedure was completed in 76 minutes.

At follow-up ERCP 6 weeks later, the stent was not visible, and fluoroscopy confirmed intraductal migration (Fig. 5). Again, the PC was removed and transpapillary wire passage was completed in a manner similar to the previous procedure. This time, the cholangioscope was passed through the cystic duct and guided to the major papilla. This also helped to direct the enteroscope to the major papilla. The stent was removed using grasping forceps under direct cholangioscopic visualization (Fig. 6). The cholangioscope was used to fragment

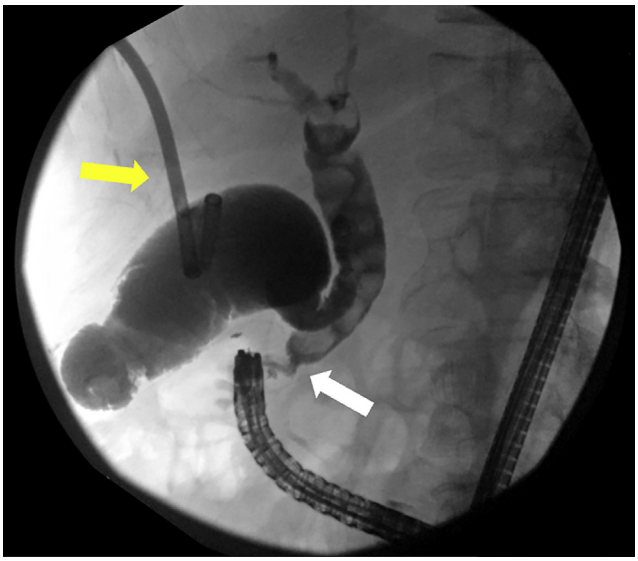

Figure 1. Contrast injection via the percutaneous cholecystostomy tube shows multiple filling defects within a dilated common bile duct. The percutaneous cholecystostomy is seen within the gallbladder (*yellow arrow*). A small wisp of contrast is seen between the distal common bile duct and the enteroscope within the bowel lumen (*white arrow*).

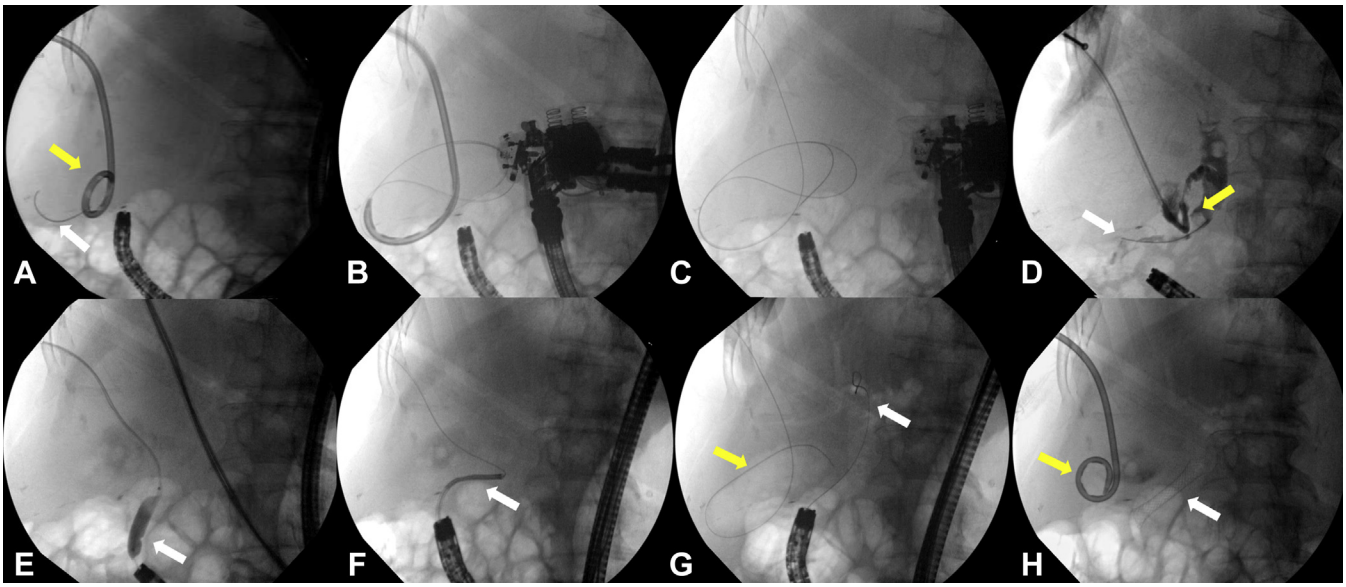

Figure 2. Percutaneous transcystic cholangioscopy-assisted ERCP. **A,** A wire (*white arrow*) is advanced through the percutaneous cholecystotostomy (PC) tube (*yellow arrow*). **B,** The locking string on the PC is cut to release the coil. **C,** The PC tube is removed and the wire is coiled in the gallbladder. **D,** The cholangioscope is advanced to the cystic duct opening (*yellow arrow*) allowing wire passage transpapillary to the small bowel lumen (*white arrow*). **E,** Balloon sphincteroplasty (*white arrow*) is performed over the wire. **F,** The cholangioscope (*white arrow*) can then be advanced retrograde through an adult colonoscope into the bile duct. **G,** After lithotripsy, a wire is placed in the bile duct (*white arrow*) and a second wire is placed percutaneously through the PC tract into the gallbladder. **H,** A fully covered self-expanding metal stent is placed into the common bile duct (*white arrow*) and a new PC is placed (*yellow arrow*).

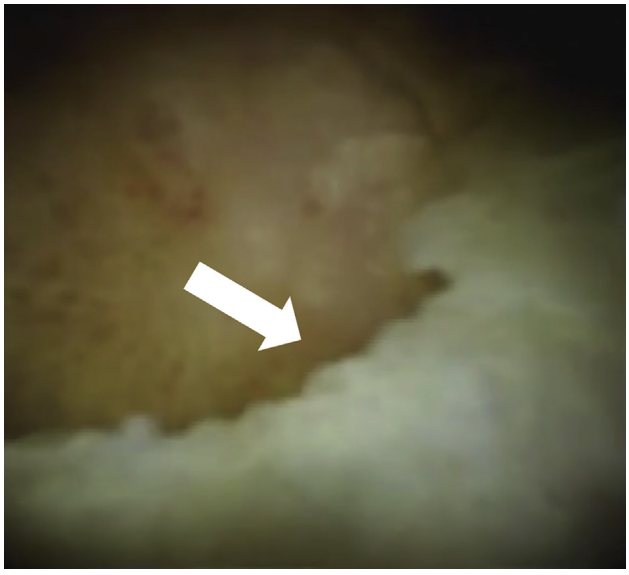

Figure 3. Cholangioscopic view of the cystic duct opening (*white arrow*) from within the gallbladder.

extensive stones within the gallbladder, and the common bile duct was subsequently cleared. Completion occlusion cholangiogram showed no residual filling defects. Total procedure time was 129 minutes. The patient did well after the procedure. He was maintained with a PC because he was not a surgical candidate.

Endoscopic access to the biliary tree can be difficult in altered anatomy. EA-ERCP carries modest success rates[1] and limited therapeutic options owing to the small working channel. Although EUS-facilitated biliary access can be highly effective,[2] it is not always technically feasible. Percutaneous transhepatic cholangioscopy has been used with high success rates and low adverse event rates for choledocholithiasis.[3] However, transcystic access is rarely reported.[4] Our case demonstrates the safe and effective use of this technique.

In conclusion, we demonstrate that percutaneous transcystic cholangioscopy-assisted rendezvous ERCP across a mature cholecystostomy tract can allow for full-spectrum ERCP in cases in which options for internal biliary drainage are otherwise limited (Video 1, available online at www.VideoGIE.org).

DISCLOSURE

Dr Kumbhari is a consultant for Boston Scientific, Pentax Medical, Medtronic, Fujifilm, and Apollo Endosurgery and receives research support from Apollo Endosurgery and ERBE. Dr Khashab is on the advisory board for Boston Scientific and Olympus and is a consultant for Boston Scientific, Olympus, Medtronic, and GI Supply. All other authors disclosed no financial relationships.

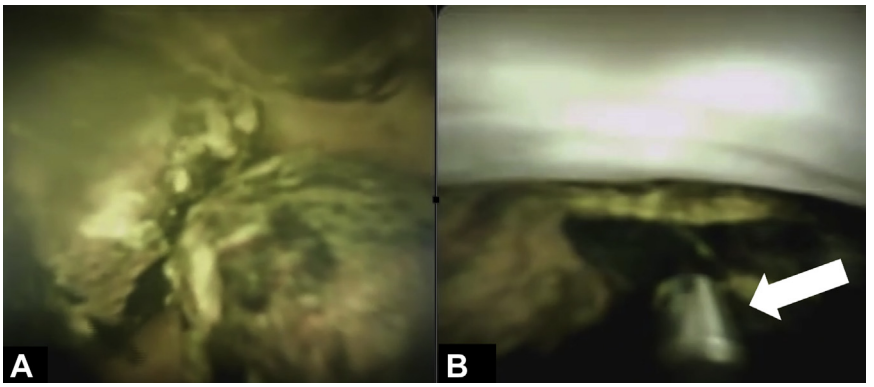

Figure 4. The cholangioscope is advanced retrograde into the common bile duct. **A,** Multiple large bile duct stones are seen. **B,** The catheter (*white arrow*) is advanced to perform electrohydraulic lithotripsy.

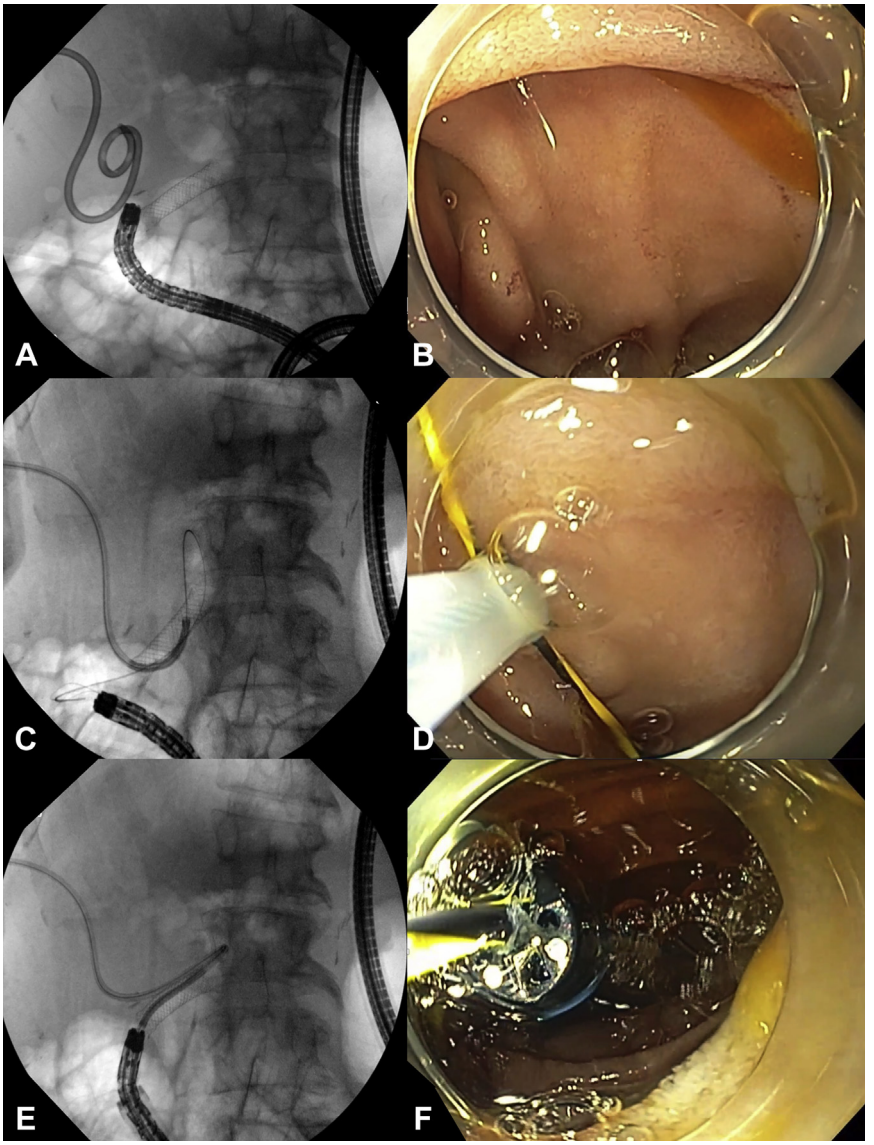

Figure 5. Percutaneous transcystic cholangioscopy-assisted ERCP for removal of migrated stent. **A,** Fluoroscopic image and **(B)** endoscopic image of the enteroscope at the area of the papilla. The stent is not seen in the bowel lumen but seen on fluoroscopy, confirming intraductal migration. **C,** Fluoroscopic image and **(D)** endoscopic image of the cholangioscope passed percutaneously to allow cannulation of the cystic duct from the gallbladder and passage of the wire transpapillary into the bowel lumen, which is then grasped using a snare through the enteroscope. **E,** Fluoroscopic image and **(F)** endoscopic image of the cholangioscope advanced over wire through the cystic duct, the common bile duct, and transpapillary into the bowel lumen, which then helps to guide the enteroscope to the major papilla.

Figure 6. The cholangioscope is passed percutaneously through the cystic duct and into the bile duct, where the intraductal migrated stent is seen. Under direct visualization, grasping forceps (*white arrow*) from the enteroscope are used to remove the migrated stent.

Abbreviations: EA-ERCP, enteroscopy-assisted endoscopic retrograde cholangiopancreatography; PC, percutaneous cholecystostomy.

REFERENCES

1. Skinner M, Popa D, Neumann H, et al. ERCP with the overtube-assisted enteroscopy technique: a systematic review. Endoscopy 2014;46:560-2.
2. Jovani M, Ichkhanian Y, Vosoughi K, et al. EUS-guided biliary drainage for postsurgical anatomy. Endosc Ultrasound 2019;8:S57-66.
3. Kint JF, van den Bergh JE, van Gelder RE, et al. Percutaneous treatment of common bile duct stones: results and complications in 110 consecutive patients. Dig Surg 2015;32:9-15.
4. Rodrigues-Pinto E, Pereira P, Macedo G. Percutaneous transcystic cholangioscopy-guided electrohydraulic lithotripsy in a patient with altered surgical anatomy. Endoscopy 2020;52:E392-3.

Division of Gastroenterology & Hepatology, Johns Hopkins Medicine, Baltimore, Maryland (1), Division of Gastroenterology, Hepatology & Nutrition, Ohio State University Wexner Medical Center, Columbus, Ohio (2).

If you would like to chat with an author of this article, you may contact Dr Zhang at lzhan170@jhmi.edu.

Copyright © 2021 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.vgie.2021.01.012

***VideoGIE* Quiz**

Think you can outsmart *VideoGIE*? Try your luck with our new Quiz series. Using cases published in *VideoGIE*, we post questions designed to improve the education of our fellows. Go to http://www.videogie.org to submit your answer, and keep checking back for more quizzes!