Disposable digital percutaneous cholangioscope-aided retrieval of a plastic biliary stent after failed retrieval at ERCP

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A 74-year-old man presented 2 years after a cholecystectomy with abnormal liver function tests (total bilirubin 5.4 mg/dL, alkaline phosphatase 207 units/mL, aspartate aminotransferase 391 units/mL, and alanine aminotransferase 395 units/mL), a high-grade hilar stricture, and a filing defect in the right intrahepatic duct on magnetic resonance imaging. ERCP showed a 1.3-cm stricture in the common hepatic duct (CHD). Cholangioscopy (Spyglass DS II Access & Delivery Catheter, Boston Scientific, Natick, Mass, USA) showed a surgical staple in the mucosa at the distal end of the CHD stricture. A small stone proximal to the stricture could not be accessed even after dilating the stricture with a 6-mm balloon. A 7F, 12-cm plastic stent was placed across the iatrogenic stricture into the right intrahepatic duct.

Repeat ERCP was scheduled 10 weeks later to remove the biliary stent and attempt clearance of the duct. While attempting stent retrieval with a snare, the proximal flap of the stent was noted to be embedded in a peripheral right intrahepatic duct and could not be extracted through the high-grade iatrogenic CHD stricture. In this process, the intraduodenal portion of the distal end of the stent sheared off (Fig. 1A and B). Attempts were made to retrieve the stent with a rat-tooth forceps, extraction balloon, and cholangioscopy, without success.

A same-session percutaneous cholangioscope-aided stent retrieval was planned with the interventional radiology team. This was performed 10 weeks after the second ERCP. After obtaining percutaneous right-sided biliary access, a guidewire was passed into the distal duodenum. A 12F sheath was advanced percutaneously to the hilum, after dilation of the percutaneous tract. The proximal end of the stent extended above the level at which the sheath encountered the stent (Fig. 1A; Video 1, available online at www.giejournal.org).

The novel short cholangioscope (SpyGlass Discover, Boston Scientific) (Fig. 1B) was then advanced by 1 endoscopist (S.T.) into the 12F percutaneous sheath. With respiratory movement of the diaphragm, however, the proximal end of the stent was noted to move proximally into the right intrahepatic duct, precluding attempts at capturing the proximal end for extraction (Video 1). Hence, a second endoscopist (S.G.) applied countertraction on the sheared-off distal end of the stent, which was extending out of the ampulla, with a rat-tooth forceps advanced through the duodenoscope (Fig. 1D and E).

The proximal end of the stent was grasped with a retrieval snare (SpyGlass Retrieval Snare, Boston Scientific) and maneuvered into the percutaneous 12F sheath by simultaneously pushing in the percutaneous sheath and pulling on the distal end of the stent, to ensure the stent fit into the percutaneous sheath for retrieval (Fig. 1E and F; Video 1). The distal end of the stent was then released from the grasp of the rat-tooth forceps extending out of the duodenoscope and was smoothly withdrawn through the 12F sheath and out of the patient's body (Video 1). The cholangioscope was reintroduced into the percutaneous sheath, and the hilum and extrahepatic duct were examined. A surgical staple was found in the hilar mucosa (Fig. G; Video 1). The stone seen previously was not seen on cholangioscopy or cholangiogram (Fig. H).

The interventional radiology team left an internal-external drain in place to prevent bile leak at the percutaneous puncture site. The next day, the drain had to be upsized because of a pericatheter leak; it was exchanged 2 weeks later because of a recurrent pericatheter leak. Three weeks later, the internal-external drain was exchanged for an external percutaneous drain, after removal of a distal common bile duct filling defect. The external biliary drain was removed 6 weeks after the percutaneous cholangioscopy.

The new disposable cholangioscope is primarily intended for laparoscopically assisted cholangioscopy. It has the advantage of increased maneuverability owing to a shorter length (65 cm) and a more flexible tip; hence, it is a useful tool for percutaneous cholangioscopy for indications such as stent retrieval, stone clearance, or evaluation of biliary strictures, when retrograde cholangioscopy through the duodenoscope is unsuccessful or precluded by the patient's anatomy.

Percutaneous cholangioscopy requires coordination between the endoscopy and interventional radiology teams. Same-session cholangioscopy via a percutaneous sheath avoids the need for tract maturation, especially for urgent indications—a drawback of classical percutaneous cholangioscopy with reusable large-caliber cholangioscopes.[1,2] The percutaneous tract has to mature before removal of the percutaneous sheath to avoid a bile leak.

DISCLOSURE

All authors disclosed no financial relationships.

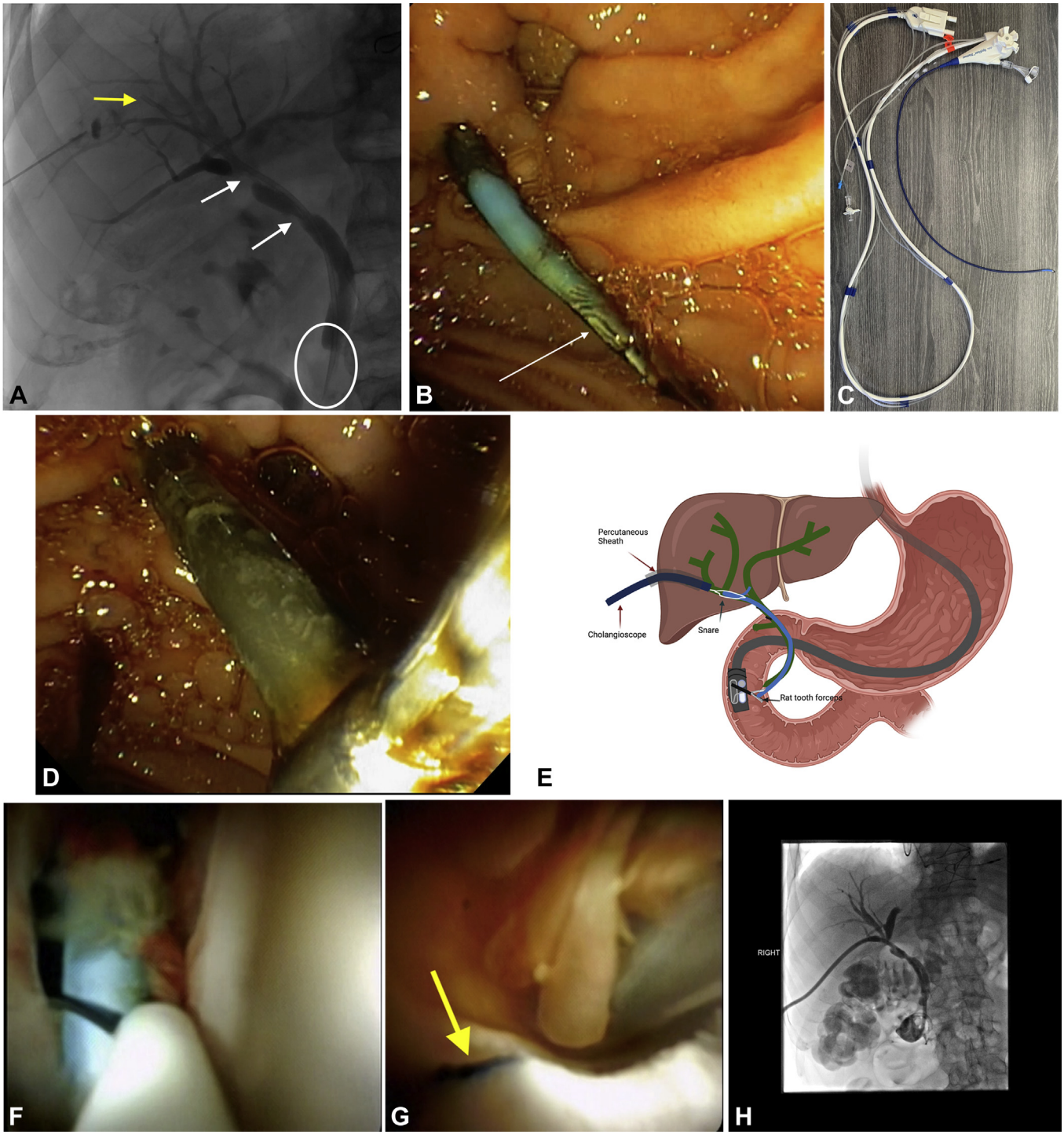

Figure 1. A, Scout fluoroscopic image showing the proximal end of the plastic stent (*yellow arrow*), the surgical clips causing the iatrogenic stricture in the common hepatic duct (*white arrows*), and the sheared-off distal end of the stent (*white oval*). **B,** Endoscopic view of the sheared distal end of the common bile duct stent extending out of the ampulla. **C,** Image of the novel disposable percutaneous digital cholangioscope. **D,** Endoscopic view of countertraction applied on the sheared-off distal end of the stent with a rat-tooth forceps. **E,** Pictorial description of countertraction on the distal end of the stent to enable percutaneous retrieval. **F,** Percutaneous cholangioscopic view of SpyGlass Retrieval snare around the proximal end of the plastic stent. **G,** Cholangioscopic view of surgical clip embedded in the hilar mucosa (*yellow arrow*). **H,** Completion cholangiogram after stent retrieval.

Abbreviation: CHD, common hepatic duct.

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