



Advanced techniques for pancreaticobiliary stone extraction

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Background and Aims: Pancreaticobiliary stone extraction during endoscopic retrograde cholangiopancreatography can be challenging when working space is limited or the duct is irregular and strictured. We aimed to demonstrate several difficult anatomic scenarios in which stone extraction was accomplished by ductoscopic grasping and retrieval using miniature devices.

Methods: In 2 cases, a miniature retrieval basket and snare are used during cholangioscopy to grasp refractory stones in the intrahepatic and cystic ducts, respectively. In cases 3 and 4, a miniature basket and snare are used during pancreatoscopy to facilitate stone extraction from stenotic and tortuous pancreatic ducts. In case 5, a miniature forceps is used to extract a stone from within a dilated pancreatic side branch.

Results: Stone extraction was successful in all cases without adverse events.

Conclusions: Miniature grasping accessories that fit through the working channel of the cholangioscope/pancreatoscope may allow stone retrieval in difficult anatomic scenarios and thus represent a meaningful addition to our therapeutic armamentarium for the treatment of this condition. (VideoGIE 2020;5:324-5.)

By enabling electrohydraulic lithotripsy, peroral cholangioscopy and pancreatoscopy have emerged as important tools in the management of recalcitrant pancreaticobiliary stone disease.^{1,2} After fragmentation, stone particles are typically removed from the duct using a standard extraction balloon or retrieval basket. Stone extraction, however, can prove challenging when working space is limited or the duct is irregular and strictured, which is common in chronic pancreatitis. Aggressive balloon dilation of the duct may overcome this challenge in some cases, but it is not always technically possible and incurs the risks of bleeding and perforation. Novel small-caliber grasping devices that can be advanced through the working channel of a cholangioscope or pancreatoscope may facilitate stone retrieval in challenging cases and have recently become commercially available. Herein, we demonstrate several difficult anatomic scenarios in which stone extraction was accomplished by ductoscopic grasping and retrieval.

METHODS

Originally introduced as “mother-daughter” dual operator platform, peroral cholangioscopy and pancreatoscopy during ERCP have evolved substantially in the last 3 decades. A single-operator digital ductoscopy system (Spyglass DS; Boston Scientific Corporation, Marlborough, Mass, USA) has been available in the United States since

2015 and is commonly used to evaluate indeterminate strictures and provide visualization for electrohydraulic lithotripsy.³ A dedicated biopsy forceps (Spybite, Boston Scientific) was traditionally the only accessory available for use through this system, but in 2018, a miniature retrieval basket and snare were introduced for the purpose of removing stone fragments and migrated stents.

OUTCOMES

In the first case, in a patient with recurrent biliary-type abdominal pain after cholecystectomy, MRCP revealed a retained stone within a second-order left intrahepatic duct. During ERCP, the stone could not be extracted with a balloon because of a bottleneck effect at the biliary confluence. The cholangioscope was advanced to the level of the stone, and a retrieval basket was used to capture the stone (Fig. 1) and guide it through the confluence and out of the bile duct. In the second case, during treatment of choledocholithiasis, 2 stones were encountered within a short cystic duct remnant; the decision was made to remove them because they may have been contributing to symptoms and were at risk for future migration into the common duct. There was insufficient space upstream of the stones to allow standard balloon extraction. Thus, cholangioscopy was used to grasp the stones with a miniature snare and remove them from the cystic stump.

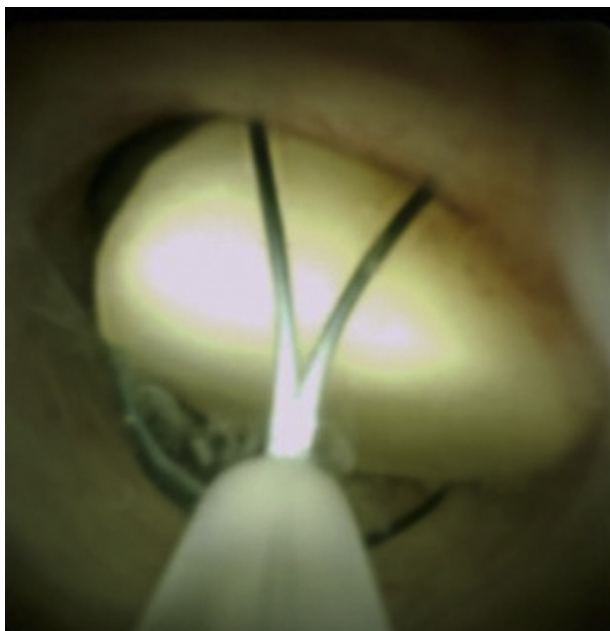


Figure 1. Digital cholangioscopic image of a bile duct stone captured within the retrieval basket.

In the third and fourth cases, balloon extraction of medium-sized pancreatic stones was unsuccessful despite balloon dilation of the surrounding duct because of relative stenosis and tortuosity. Pancreatotomy was used to identify the stones and capture them with a retrieval basket and snare, respectively, and subsequently guide them cautiously through the tortuous duct (Fig. 2). In the last case, a large, partially obstructing pancreatic stone could not be extracted because of its position primarily within a side branch. The Spybite forceps was therefore used through the pancreatoscope to grasp the stone and reposition it from the side branch into the main duct, after which it was extracted with a balloon (Video 1, available online at www.VideoGIE.org).

CONCLUSION

Although balloon extraction is the mainstay of pancreaticobiliary stone removal, insufficient working space, stenosis, and tortuosity are challenges that cannot always be overcome by dilation of the duct or the use of a basket. Miniature grasping accessories that fit through the working channel of the cholangioscope/pancreatotomy may allow stone retrieval in difficult anatomic scenarios and thus represent a meaningful addition to our therapeutic armamentarium for the treatment of this condition.

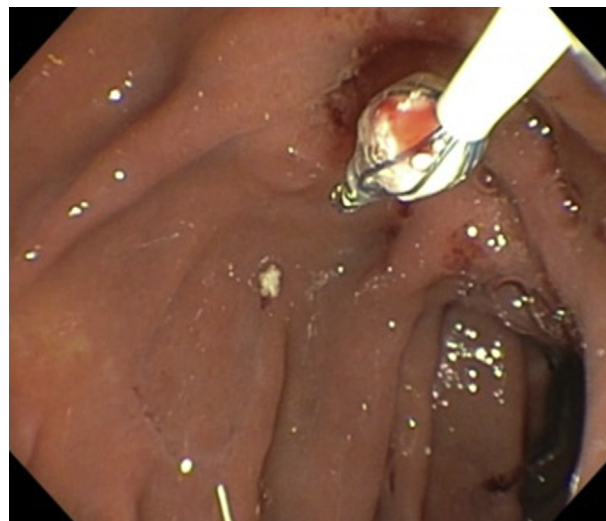


Figure 2. Endoscopic image of a pancreatic stone immediately after removal from the duct using a retrieval basket.

DISCLOSURE

Dr Elmunzer is a consultant for Takeda Pharmaceuticals. Dr Coté is a consultant for Olympus Corporation and receives research support from KC Specialty Therapeutics and Boston Scientific Corporation. All other authors disclosed no financial relationships.

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