

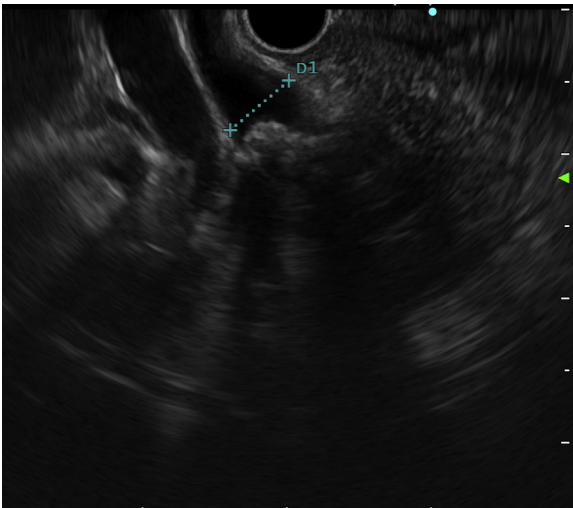


## EUS-guided rendezvous with a steerable access needle in choledocholithiasis

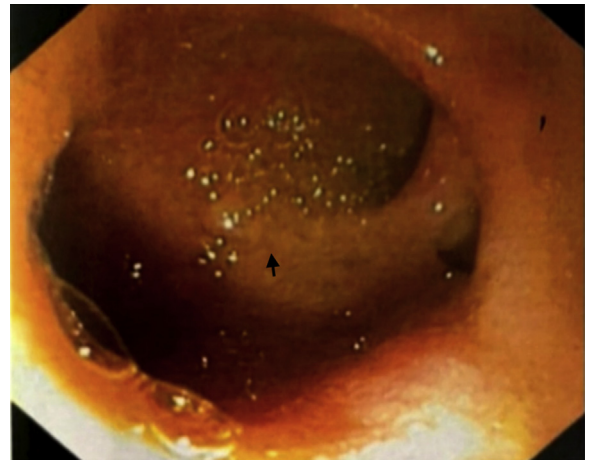
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A 60-year-old man who had previously undergone cholecystectomy was seen for a 4-week history of abdominal pain and fever. Investigations revealed leukocytosis (12,000 cell/mm<sup>3</sup>) and deranged liver function test results (bilirubin 3 mg/dL, serum alkaline phosphatase 360 IU/L). An ultrasound of the abdomen showed a dilated common bile duct (CBD).

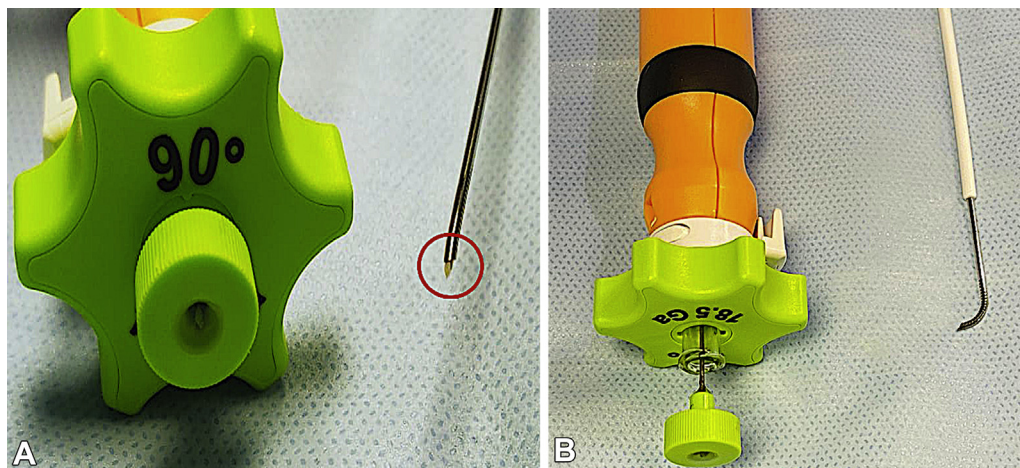
EUS (UCT-180; Olympus Ltd, Tokyo, Japan) revealed a dilated CBD with multiple calculi without intrahepatic biliary radicle dilation (Fig. 1). Attempts at biliary access during ERCP were unsuccessful because of nonvisualized intradiverticular papilla and duodenal deformity (Fig. 2). Hence, EUS-guided rendezvous (EUS-RV) was considered.



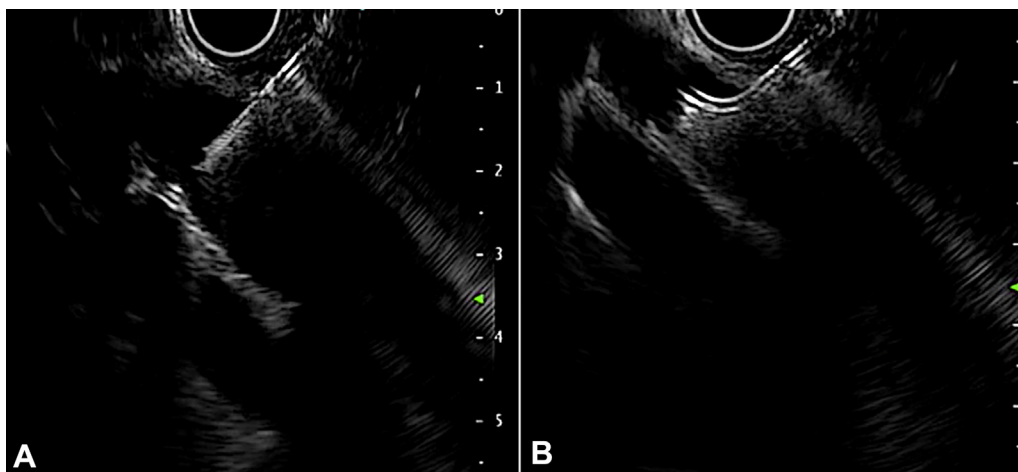
**Figure 1.** Linear EUS. Dilated common bile duct with multiple stones.



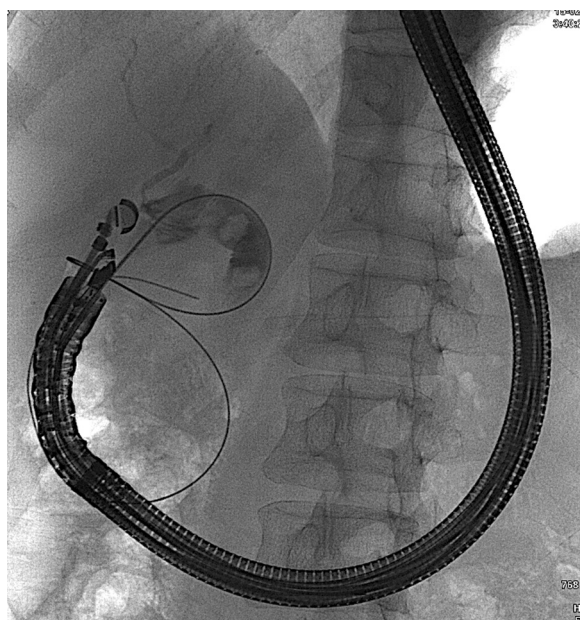
**Figure 2.** Duodenal diverticulum with nonvisualized intradiverticular papilla with multiple out-pouching.



**Figure 3.** Beacon needle. External image. **A**, Sharp stylet projecting beyond the tip of the straight needle. **B**, Needle tip bent (90°) on withdrawal of the stylet.

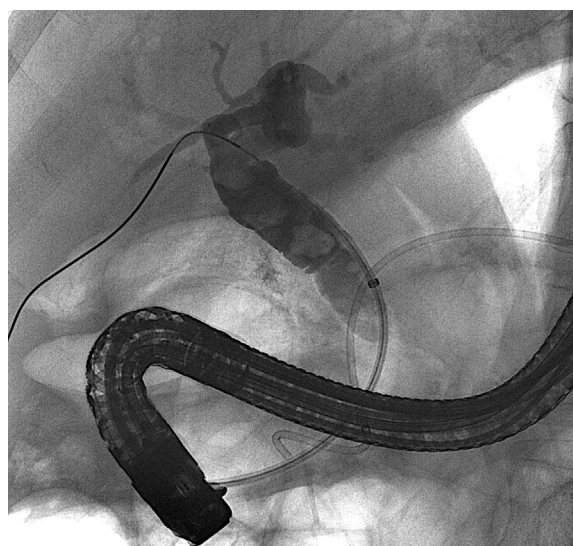


**Figure 4.** EUS image with the needle inside the common bile duct. **A**, Straight needle. **B**, Needle tip bent (90°) on withdrawal of the stylet.



**Figure 5.** Dilated common bile duct with stones. Access needle bent with the tip pointing toward the papilla. Guidewire projecting through the needle is across the papilla and coiled within the duodenum.

With the echoendoscope in the long position, the dilated CBD was punctured through the first part of the duodenum with a steerable access needle device (18.5-gauge, 90°, Beacon EUS access system; Covidien, St Louis, Mo, USA). On stylet withdrawal, the needle tip was angled to 90° and could be manually rotated from the control at its hub to direct the tip toward the papilla (Fig. 3 and 4, Video 1, available online at [www.VideoGIE.org](http://www.VideoGIE.org)). Cholangiogram showed a dilated CBD with multiple calculi. A hydrophilic guidewire (0.035" 260-cm long; Terumo, Tokyo, Japan) was passed via needle into the CBD and was gently manipulated across the papilla into the duodenum (Fig. 5). The echoendoscope was then



**Figure 6.** Cholangiogram showing dilated common bile duct with multiple calculi.

exchanged with the duodenoscope (TGF Q180V; Olympus), leaving the guidewire in place for the biliary RV procedure.

Attempts at biliary cannulation of the papilla beside the protruding guidewire (parallel RV) failed because of the unstable position of the duodenoscope, which repeatedly fell back into the stomach. A needle-knife precut was performed for biliary access. On cannulation, the guidewire entered the pancreatic duct, and a prophylactic plastic 5F 5-cm single-pigtail stent was placed into the pancreatic duct. The CBD was cannulated with the ball-tip cannula with a guidewire. The EUS-RV guidewire was then removed. Cholangiogram confirmed a dilated CBD with



**Figure 7.** Occlusion cholangiogram showing clear common bile duct.

multiple calculi (Fig. 6). Biliary sphincteroplasty was performed with a 12-mm controlled radial expansion balloon. The CBD stones were extracted one by one using a stone extraction balloon. Finally, the balloon occlusion cholangiogram established a clear CBD without any filling defect (Fig. 7). A double-pigtail (7F, 10-cm) plastic stent was placed into the CBD.

EUS-guided biliary access and drainage is generally considered for malignant biliary obstruction with failed ERCP. There are a few reports of EUS interventions for benign biliary condition.<sup>1,2</sup> EUS-RV is an alternate option for CBD stones in failed ERCP. The novel steerable access needle provides the opportunity to manipulate the guidewire in the desired direction without the risk of sheering.

In malignant biliary obstruction, transmural metal stent placement (EUS-guided choledochoduodenostomy or EUS-guided hepaticogastrostomy) can be considered if the guidewire fails to cross the stricture or papilla. This fall-back option is not considered in benign biliary obstruction. The transhepatic antegrade approach (EUS-RV or percutaneous transhepatic cholangiography [PTC]-guided) is an

option in benign biliary obstruction with intrahepatic biliary radicle dilation. However, in dilated CBD without intrahepatic biliary radicle dilation, only transduodenal EUS access is possible. Guidewire manipulation across the papilla without sheering is the most challenging step and crucial for the success of the entire procedure. The steerable needle helps in overcoming this rate-limiting step. In the steerable needle device, the sharp stylet tip that projects beyond the tip of the needle is used for the initial puncture (Fig. 3). After gaining access into the CBD, on withdrawal of the stylet, the hollow needle tip is smoothly bent to a predesignated angle. This device is available in 2 specifications, depending on the designated angle of bend achieved for the terminal part of the needle on withdrawal of the stylet (90° and 135°). Marrache et al<sup>3</sup> reported use of the steerable needle in EUS-RV of a benign biliary stricture. In a patient with failed CBD cannulation or inaccessible papilla, EUS-guided biliary access can be considered with a steerable needle, even in benign biliary conditions. Further studies with large sample sizes are required to evaluate the safety and efficacy of this device.

## DISCLOSURE

*All authors disclose no financial relationships.*

*Abbreviations: CBD, common bile duct; RV, rendezvous.*

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