



Cholangioscopy-guided basket retrieval of impacted stones

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ERCP remains the primary method of removing bile duct stones.¹ Standard ERCP techniques, including endoscopic sphincterotomy with balloon sweeping or basket extraction, carry a >90% success rate in removing stones; however, large or impacted stones may present a particularly challenging scenario for the endoscopist.² Alternative solutions include the use of mechanical lithotripsy or cholangioscopy-guided methods, such as electrohydraulic or laser lithotripsy. However, stones may be in a position in which extraction by conventional balloon or basket under fluoroscopic guidance may be difficult (eg, in the intrahepatic ducts).

The SpyGlass Retrieval Basket (Boston Scientific, Marlborough, Mass, USA) can be inserted through the SpyGlass cholangioscope (Boston Scientific) to allow for capture and removal of stones under direct visualization.³ This retrieval basket represents the second iteration of the device; the first iteration was challenging to open adequately. In [Video 1](#) (available online at www.VideoGIE.org), we demonstrate the technique of using this novel device in removing difficult-to-retrieve stones under cholangioscopy guidance.

ENDOSCOPIC METHODS

An ERCP is performed using the standard technique with cannulation of the bile duct and cholangiogram, upon which several stones, including 1 in an intrahepatic duct, are visualized. After sphincterotomy, attempts to re-

move the intrahepatic duct stone with a balloon are unsuccessful because the catheter cannot be advanced past the stone. The cholangioscope is then inserted over the guidewire into the bile duct. Upon visualization of the stone, which appears impacted against upstream ductal mucosa ([Fig. 1](#)), the retrieval basket is advanced (exiting at the 5 o'clock position) upstream of the stone ([Fig. 2](#)). The basket is then opened with a gentle to-and-fro motion to enclose and dislodge the impacted stone. The basket can then be slightly closed to ensure an adequate hold on the stone ([Fig. 3](#)). In this case, some fragmentation of the stone occurs when the basket is closed; once the stone is captured, the cholangioscope is withdrawn transpapillary for stone extraction ([Fig. 4](#)). Irrigation through the cholangioscope is then performed to release any debris from the basket before closure and reuse. The cholangioscope is inserted back into the bile duct to ensure all stones have been removed, with complete clearance confirmed on cholangiogram ([Fig. 5](#)).

RESULTS

We have used the retrieval basket under direct visualization in 5 patients: 3 patients with bile duct stones and 2 patients with pancreatic duct stones. In all 5 patients, use of the retrieval basket was successful in removing stones that were not extracted with a conventional balloon or basket. None of the 5 patients had any adverse events, such as

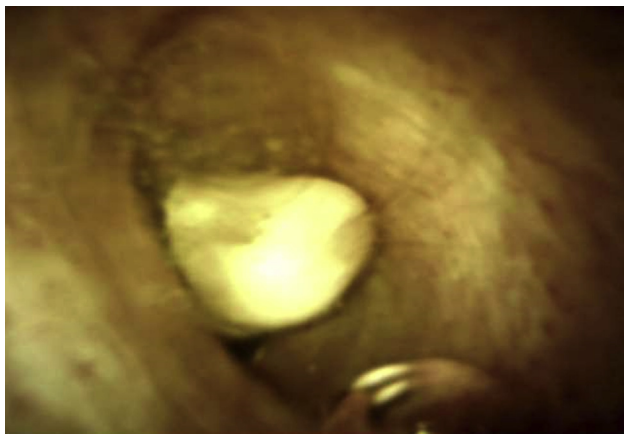


Figure 1. Impacted stone surrounded by sludge on cholangioscopy.

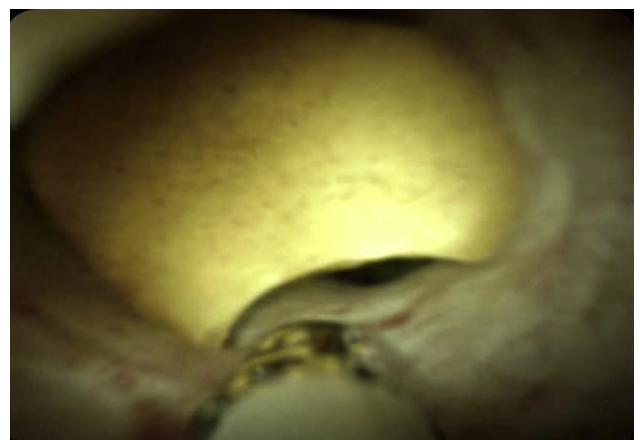


Figure 2. Retrieval basket positioned inferior to the impacted stone before opening and capture.

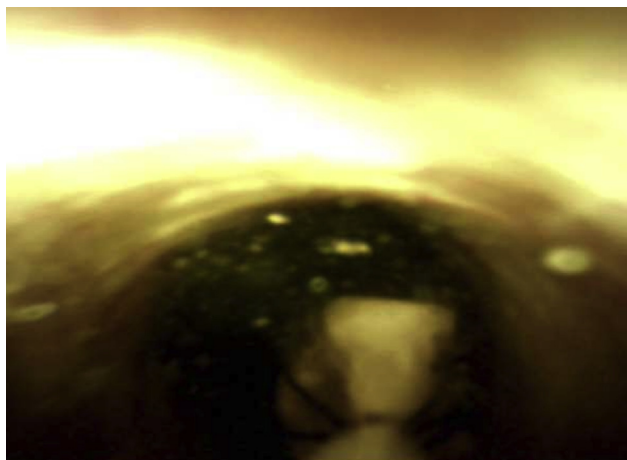


Figure 3. Stone enveloped within basket.

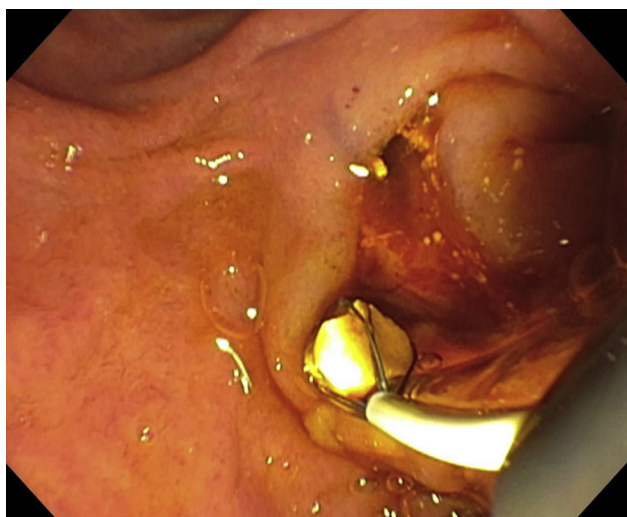


Figure 4. Stone within retrieval basket withdrawn into the duodenum by withdrawal of the cholangioscope.

bleeding, perforation, or pancreatitis. No device malfunctions occurred, and there were no instances of inability to release the stone from the basket.

CONCLUSIONS

Video 1 illustrates the use of a cholangioscopy-guided retrieval basket to remove impacted stones from the bile duct. Use of this device allowed disimpaction of the stones and precise capture under direct visualization, which may be useful in cases in which the wire cannot be advanced upstream of a stone or when the extraction balloon, given the catheter tip distance from the balloon, is ineffective in dislodging the stone. Larger future studies should examine the efficacy of this technique in removing both bile and



Figure 5. Final cholangiogram demonstrating complete clearance of all stones.

pancreatic duct stones refractory to conventional extraction techniques.

DISCLOSURE

Dr Shah is consultant for Boston Scientific, Olympus, and Cook Medical and is an advisory board member for Boston Scientific. The other author disclosed no financial relationships.

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