

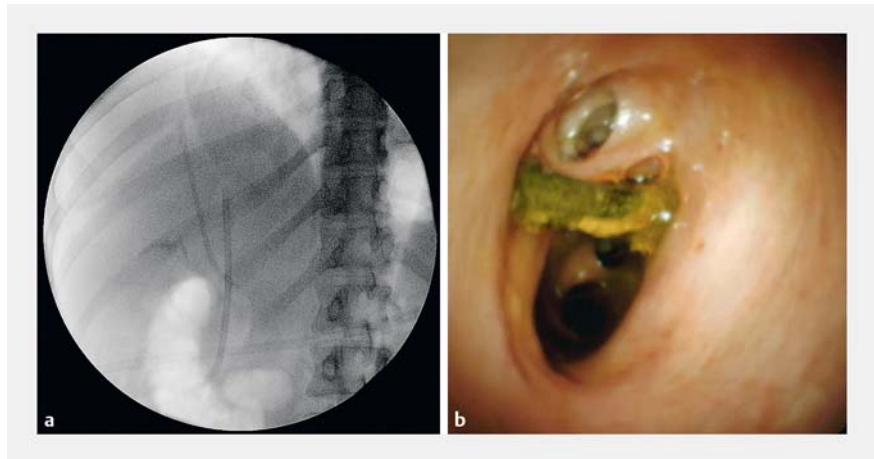
Application of cholangioscope-compatible retrieval basket

The availability of single-operator cholangioscope-compatible accessories for object retrieval has been limited [1]. We present four cases where a recently introduced cholangioscope-specific basket (SpyGlass Retrieval Basket; Boston Scientific, USA), approved by the US Food and Drug Administration (FDA), was used for object retrieval under direct visualization.

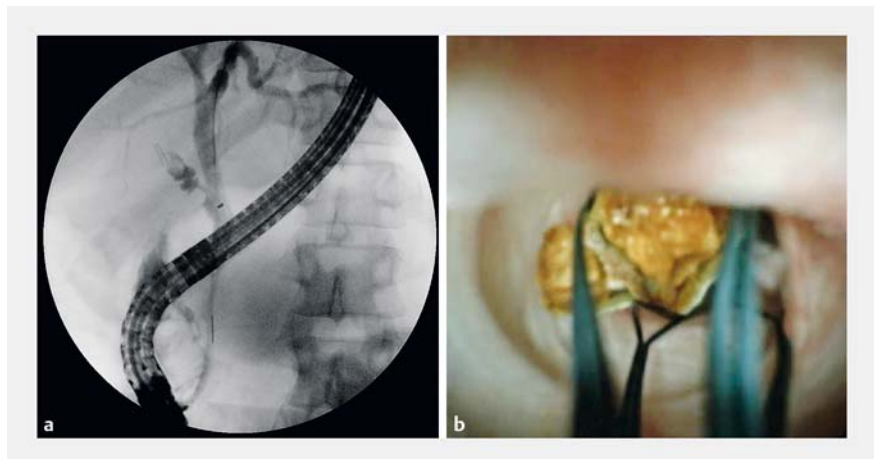
Patient 1. A 29-year-old woman with right upper quadrant abdominal pain and a biliary stent that had been retained for 4 years was referred for stent removal. The initial removal attempt failed because of significant stent angulation and proximal stent migration (► **Fig. 1 a**); an additional stent was placed to assure drainage prior to referral. The impacted stent (► **Fig. 1 b**) was captured under direct visualization, using a cholangioscopic basket, and removed intact (► **Video 1**).

Patient 2. A 45-year-old woman with a biliary stent presented for removal of the stent after cholecystectomy. Cholangiography revealed retained large cystic duct stones (► **Fig. 2 a**). The stones were fragmented with electrohydraulic lithotripsy (EHL), and the fragments were captured in the cystic duct, using the cholangioscopic basket, and removed (► **Fig. 2 b**, ► **Video 1**) [2].

Patient 3. A 34-year-old woman who was 28 weeks pregnant presented with acute pancreatitis and biliary colic. Magnetic resonance cholangiopancreatography (MRCP) revealed cholelithiasis and distal common bile duct (CBD) stone (► **Fig. 3 a**). She underwent endoscopic ultrasonography (EUS) and endoscopic retrograde cholangiopancreatography (ERCP) without fluoroscopy [3]. EUS confirmed the MRCP findings (► **Fig. 3 b**). Cholangioscopy demonstrated a mobile yellow stone, which was captured using a cholangioscopic basket under direct visualization and removed (► **Fig. 3 c**). An extraction balloon was not used because of concern about impaction of the mobile stone when fluoroscopy would not be



► **Fig. 1** Patient 1: **a** Fluoroscopic image of migrated stent at endoscopic retrograde cholangiopancreatography (ERCP). **b** Impacted stent seen at cholangioscopy.



► **Fig. 2** Patient 2: **a** Large filling defects in the cystic duct, shown by ERCP fluoroscopy. **b** Cystic duct stones seen at cholangioscopy.

used. Cholecystectomy immediately followed. The patient had uncomplicated delivery at term.

Patient 4. A 52-year-old man with alcoholic cirrhosis (Model for End-Stage Liver Disease [MELD] score 17) presented with cholecystitis and choledocholithiasis. The patient was not considered to be an optimal surgical candidate. Cystic duct clearance was achieved with multiple stones being captured and removed using the cholangioscopic basket under direct visualization (► **Fig. 4**) [4].

The cholangioscopic basket is a useful accessory for object removal under direct visualization and has expanded the therapeutic uses of cholangioscopy.

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Competing interests

The authors declare no conflicts of interest.



► **Fig. 3** Patient 3: **a** Cholelithiasis and distal common bile duct stone seen at magnetic resonance cholangiopancreatography (MRCP). **b** Endoscopic ultrasound (EUS) confirmation of MRCP findings. **c** Stone capture and removal using cholangioscopic basket.



► **Fig. 4** Patient 4: stone captured with cholangioscopic basket.



► **Video 1** Use of a cholangioscopy basket under direct visualization to capture and retrieve a migrated stent in one patient and cystic stone fragments in another.

The authors

Lawrence Ku, Marco A. Paez, Jonathan Kung, Linda A. Hou, Viktor E. Eysselein, Sofiya Reicher

Division of Gastroenterology, Harbor-UCLA Medical Center, Torrance, California, USA

Corresponding author

Lawrence Ku, MD

Division of Gastroenterology-Medicine, Harbor-UCLA Medical Center, Torrance, CA, USA, 21840 South Normandie Ave, Ste 850, Torrance, CA 90502, USA
 Fax: +01-310-212-7837
 lawrenceku@gmail.com

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