We report the case of a 72-year-old patient who presented with an inadvertently remaining CBD stent that was completely internalized and heavily impacted by biliary concretions over its entire length 13 years after implantation. Following an unsuccessful conservative ERC salvage attempt, digital single-operator cholangioscopy (dSOC) in combination with electrohydraulic lithotripsy (EHL) was used to fragment the biliary concrements. Finally, after endoscopic papillary balloon dilatation up to 12 mm and removal of the fragmented concretions, the stent was successfully retrieved into the duodenum.

The development of technically advanced tools such as dSOC and dedicated instruments, including the SpyGlass Retrieval Snare and Retrieval Basket, have enabled removal of inadvertently proximally dislocated CBD stents. Our case shows that dSOC in combination with its instruments, such as EHL, is an effective and safe therapeutic option, even in special and rare cases such as this one, in which a stent was dislocated proximally and had become completely impacted by stones after 13 years.
**Case presentation**

A 72-year-old male patient who presented with fever and unknown focus of infection was diagnosed with a completely internalized biliary stent in the common bile duct (CBD) that was implanted for 13 years (▶Fig. 1a, ▶Fig. 1b, ▶Video 1). The stent was heavily impacted by biliary concretions over its entire length (▶Fig. 2). Smaller bile duct stones were retrieved from the distal CBD (▶Fig. 3a). Attempts to retrieve the stent with a grasping forceps, snare, and dormia basket were unsuccessful and ended with transection of the stent at its distal end, which was successfully retrieved (▶Fig. 3b, ▶Fig. 3c). Digital single-operator cholangioscopy (dSOC) confirmed the impacted biliary stent (▶Fig. 4a). The concrements were fragmented with electrohydraulic lithotripsy (EHL, ▶Fig. 4b). In the middle segment of the CBD, the stent was completely encircled and fixated by a large concretion most likely being responsible for the unsuccessful salvage attempt in conventional ERC (▶Fig. 4c, ▶Fig. 4d). Following fragmentation of all larger CBD concrements and endoscopic papillary balloon dilatation to 12 mm (▶Fig. 5a), the fragmented concrements were removed from the CBD. Finally, the stent’s distal end was grasped with a snare and the stent was successfully retrieved into the duodenum (▶Fig. 5b, ▶Fig. 5c). To ensure bile...
drainage after mechanical manipulation, a 10F/10-cm double pigtail stent was placed in the CBD (▶ Fig. 6a, ▶ Fig. 6b). Removal of proximally migrated biliary stents using cholangioscopy has been successfully performed in the past [1, 2], including in complex anatomical situations such as liver transplantation [3]. The development of technically advanced tools such as dSOC and dedicated instruments including the SpyGlass Retrieval Snare and Retrieval Basket [4, 5], have enabled removal of inadvertently proximally dislocated CBD stents. Our case shows that dSOC in combination with its instruments, such as EHL, is an effective and safe therapeutic option, even in special and rare cases, such one in which a stent was dislocated proximally and had become completely impacted by stones after 13 years. Thus, dSOC is increasingly evolving as a therapeutic salvage procedure for difficult situations in which conventional ERC would otherwise fail.

Competing interests

The authors declare that they have no conflict of interest.

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