

## Endobiliary polypectomy of biliary tumor using a prototype dedicated cholangioscope with double-bending technology

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A 67-year-old woman was admitted with recurrent episodes of upper-abdominal pain, obstructive jaundice, and cholangitis. One year earlier, a complicated open cholecystectomy had been performed because of symptomatic gallbladder stones.

Several previous conventional ERCPs showed recurrent obstructing bile duct stones and filling defects of the proximal common bile duct (CBD), necessitating a continuous indwell of biliary plastic stents. EUS and magnetic resonance imaging again confirmed a filling defect of the proximal CBD, suggesting a bile duct stone.

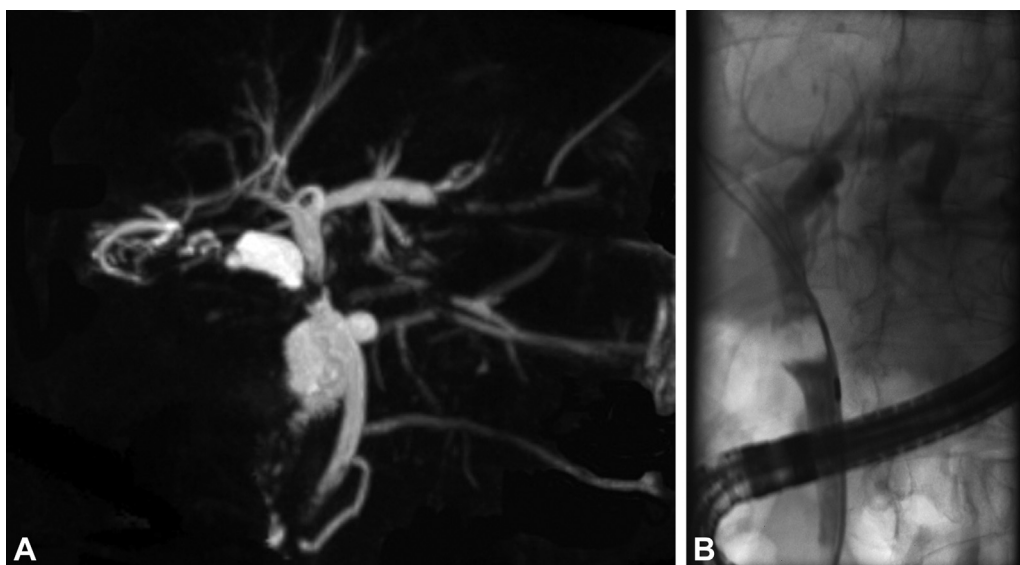
During ERCP with single-operator cholangioscopy (Fig. 1), a large stone in the proximal CBD could be visualized. After electrohydraulic lithotripsy under direct vision, cholangioscopy revealed a lumen-obstructing large pedunculated polypoid mass of the CBD that was hidden under the stone surface as the underlying cause of obstruction and recurrent stone formation. Repeated cholangioscopically guided microforceps biopsy was performed, but the results of examination were negative for the histologic diagnosis of the lesion, suggesting a subepithelial localization.

EUS and magnetic resonance imaging showed no evidence of deep infiltration. Direct per-oral cholangioscopy with a prototype dedicated cholangioscope with double-bending tech-

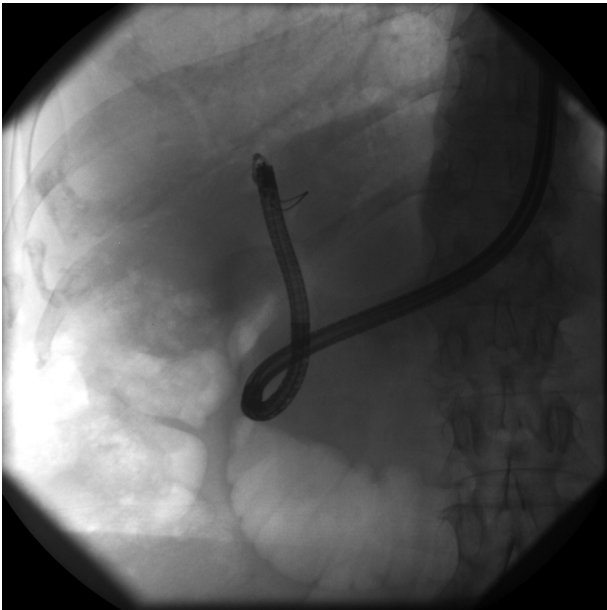
nology (Olympus Medical Systems Corporation, Tokyo, Japan) was performed (Fig. 2, Video 1, available online at [www.VideoGIE.org](http://www.VideoGIE.org)), and deep intubation of the CBD with visualization of the polypoid mass could be achieved (Fig. 3A).<sup>1</sup> A double-bending technique with 2 independent 2-way deflectable bending portions (a proximal one and a distal one) at the distal end of the insertion tube often allows for deep intubation of the bile duct without the use of an anchoring balloon.

A monofilament electro-surgical snare was advanced over the accessory channel, and the pedunculated polyp was captured at its basis (Fig. 4, Video 1). En bloc polypectomy was then performed by use of alternating cutting and coagulation currents (endocut q, effect 3, cutting 1, coagulation 6, Vio 3; Erbe Elektromedizin, Tübingen, Germany) without bleeding or perforation. The resected specimen was then grasped with the snare, and the cholangioscope was per-orally extracted.

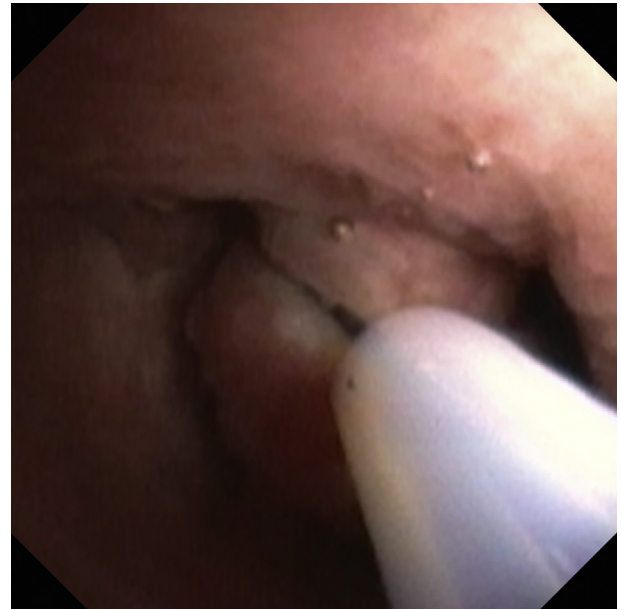
Finally, repeated intubation of the CBD with the cholangioscope confirmed the successful desobliteration of the CBD with direct insight into the biliary hilum (Fig. 3B). Endoluminal suction through the endoscope facilitated extraction of further stones that had been trapped in the



**Figure 1.** Filling defect of common bile duct as shown by magnetic resonance imaging (A) and cholangiography (B).



**Figure 2.** Direct per-oral cholangioscopic view with double-bending cholangioscope.



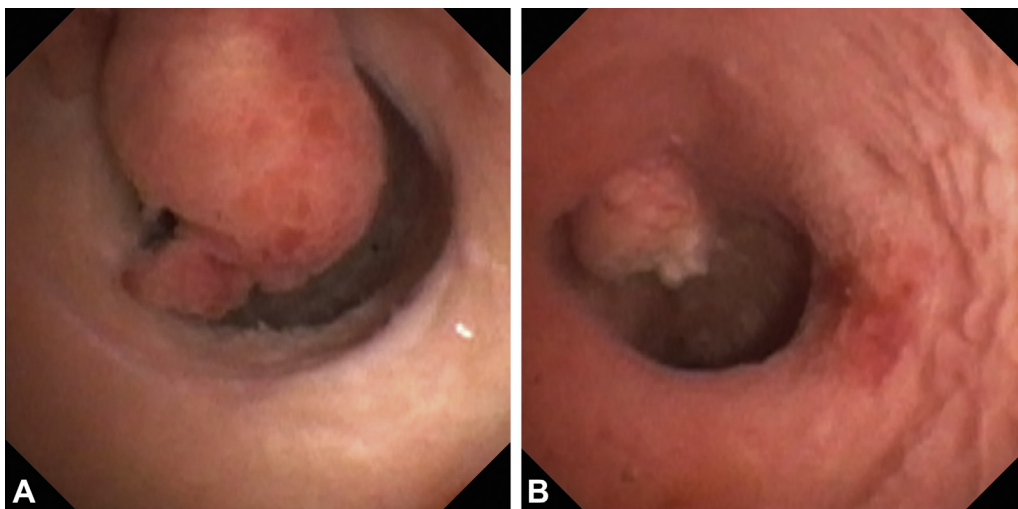
**Figure 4.** Direct peroral cholangioscopy with an endobiliary electro-surgical snare-polypectomy of a pedunculated lumen-obstructing lesion of the proximal common bile duct.

intrahepatic bile ducts. There was no need for further stent placement.

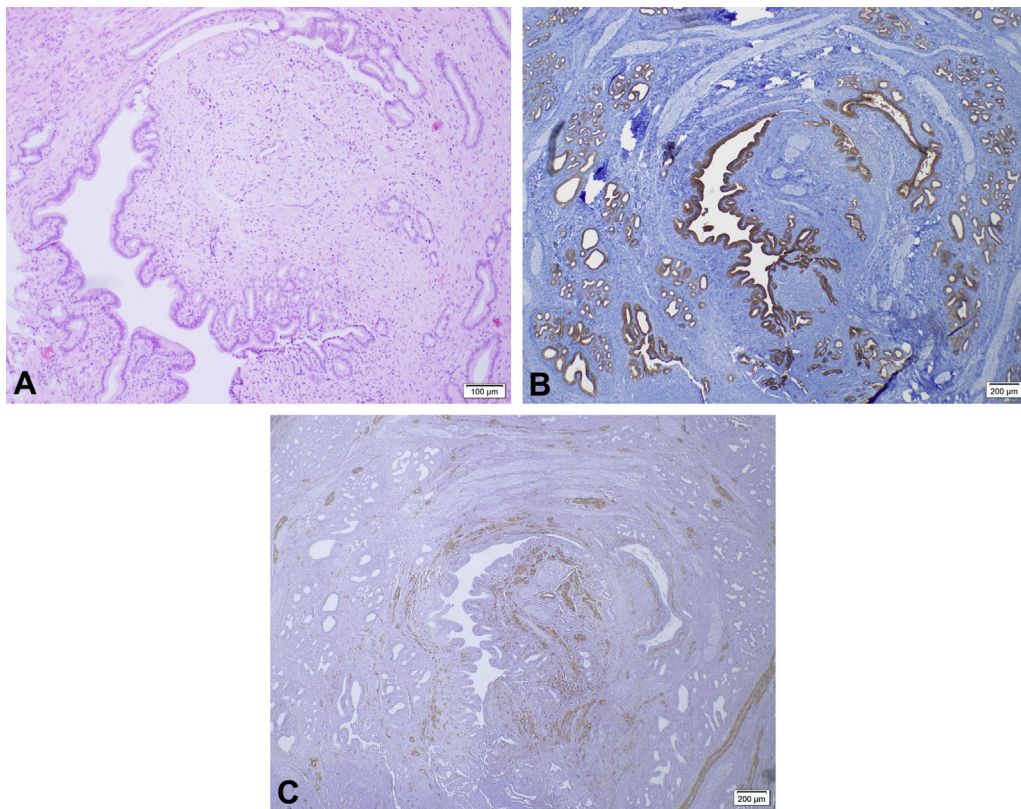
Histopathologic examination confirmed the diagnosis of a pedunculated adenomyoma of the CBD, a very rare cause of biliary obstruction, with only a few cases described in the literature, mainly in surgical case reports.<sup>2-4</sup> Adenomyomatous hyperplasia histologically consists of glandular and smooth muscle fiber proliferation of smooth muscle fibers in a fibrous stroma and is commonly found in the stomach, gallbladder, ampulla (Fig. 5), and jejunum. Adenomyomas of the bile ducts are extremely rare and are characterized as benign

localized lesions without any documented malignant potential.<sup>5</sup>

Although cholangioscopy after resection showed a small polypoid remnant, histopathologic examination confirmed free resection margins. Nevertheless, a follow-up EUS and cholangioscopy after 6 months was planned to rule out local recurrence or multifocal disease. Usually superficial and even cholangioscopically guided biopsy specimens are not diagnostic in these cases. They often lead to major hepatobiliary surgery because malignancy cannot be ruled out. Only 1 case report has



**Figure 3. A,** Direct visualization of lumen-obstructing polyp. **B,** Identification of resection site with a small polypoid remnant after removal of the polyp.



**Figure 5.** Characteristic histopathologic appearance of adenomyoma. **A**, H&E, orig. mag.  $\times 10$ . **B**, Immunohistochemical staining: strong expression of CK7 in the epithelial component, H&E, orig. mag.  $\times 4$ . **C**, Smooth-muscle actin in the muscle cell proliferations, H&E, orig. mag.  $\times 4$ .

described endoscopic removal of the lesion with multiple transpapillary forceps biopsies.<sup>3</sup>

Another case report by Anderloni et al<sup>6</sup> describes a palliative snare polypectomy in the bile duct as a debulking procedure in a patient with obstructive jaundice caused by polypoid infiltration of a metastatic colorectal carcinoma. Endobiliary snare polypectomy of the polypoid adenomyoma under direct vision in contrast has several advantages: first, en bloc resection can be performed, and direct visualization and histopathologic analysis can confirm complete removal of the lesion; second, multifocal manifestation such as diffuse adenomyomatosis of the CBD can be ruled out; and third, stone extraction can be performed under direct vision in the same session.

We make the following conclusions: (1) Patients with recurrent stone formation of unknown origin that are not amenable to conventional ERCP techniques or with persistent indeterminate filling defect of the CBD should undergo cholangioscopy to rule out underlying neoplasia. (2) In selected cases of extrahepatic bile duct disease,

direct per-oral cholangioscopy with dedicated cholangioscopes or standard ultra-slim upper endoscopes can facilitate endoluminal therapy by the use of standard endoscopic techniques and instruments, and major biliopancreatic surgery can sometimes be avoided.

## DISCLOSURE

*Dr Beyna is a consultant for Olympus and Boston Scientific and the recipient of lecture fees from Olympus, Boston Scientific, Medtronic, and Falk Foundation. Dr Neubaus is a consultant for Olympus, Boston Scientific, Erbe, and Cook and the recipient of lecture fees and consultancy honoraria from Olympus, Boston Scientific, Medtronic, Cook, Erbe, and Falk Foundation.*

*All other authors disclosed no financial relationships relevant to this publication.*

*Abbreviation: CBD, common bile duct.*

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<https://doi.org/10.1016/j.vgje.2018.08.018>

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