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From darkness to brightness: the cholangioscopy-guided selective biliary cannulation with the help of transparent cap during ERCP

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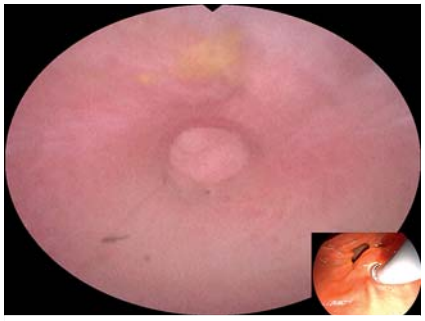
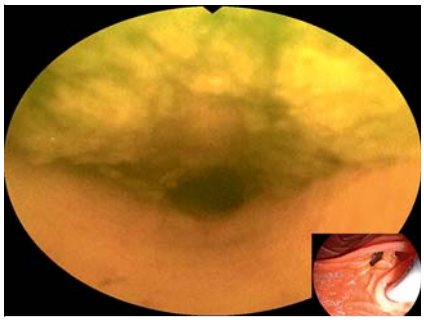
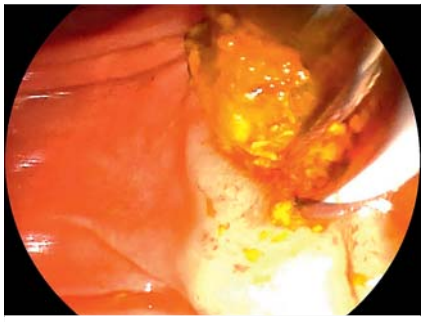


▶ **Fig. 1** The petal-shaped opening of the bile duct was directly observed under cholangioscopy.

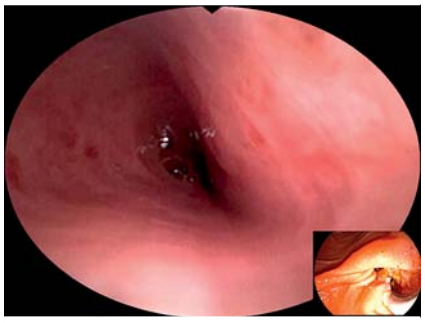
▶ **Fig. 2** The guidewire was precisely inserted into the common bile duct and identified by X-ray.



▶ **Fig. 3** A 10-mm gallstone was observed deep in the common bile duct.



▶ **Fig. 4** The gallstone was successfully removed through the basket.



▶ **Fig. 5** The common bile duct was cleaned without residual stones.

Endoscopic retrograde cholangiopancreatography (ERCP) is recommended as the primary treatment for choledocholithiasis [1]. Selective biliary cannulation is the most challenging step for ERCP since only an indirect image under X-ray can be obtained, and this process largely determines the occurrence of postoperative pancreatitis [2, 3]. Simultaneous repeated X-ray irradiation adversely affects the health of operators and patients [4]. To solve these problems, we have developed a novel biliary cannulating technique under direct vision of the cholangioscope, whose tip is covered by a conical transparent cap (▶ **Video 1**).

A 68-year-old man was diagnosed with choledocholithiasis by magnetic resonance cholangiopancreatography (MRCP) and endoscopic ultrasound (EUS) and was therefore referred for ERCP treatment. A cholangioscope fitted with a tapered transparent cap was inserted into the duodenal papilla (▶ **Fig. 1**). With the help of the tapered transparent cap pushing aside the inner folds of the papilla, we clearly observed the petal-shaped biliary orifice using a regular cholangioscope (▶ **Fig. 1**). Under the direct vision of the cholangioscope, a guidewire was precisely inserted into the common bile duct (CBD) (▶ **Fig. 2**). With the guidance of the guidewire and the expansion of the transparent cap, the cholangioscope was squeezed into the CBD successfully and showed a gallstone with a diameter of about 10 mm (▶ **Fig. 3**). After the papilla was moderately incised, the stone was completely extracted by a regular basket (▶ **Fig. 4**). The CBD was repeatedly flushed with saline, and a clean cavity without residual stones was confirmed under direct visualization of the cholangioscope (▶ **Fig. 5**).

In this case, we performed a visualized selective biliary cannulation assisted by a transparent cap-covered cholangioscope. Different from blind CBD cannulation under X-ray during traditional ERCP [5], the cholangioscopy-aided biliary cannulation is a visible operation, thus it is much easier and safer. To the best of our knowledge, this is the first report that the opening anatomy of CBD has been retrogradely observed during ERCP.

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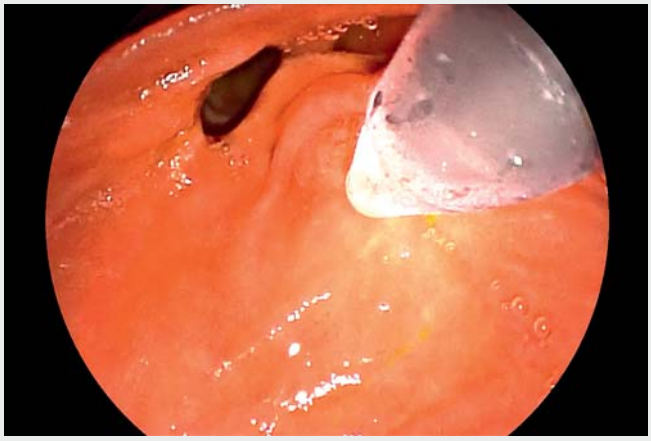
Competing interests

The authors declare that they have no conflict of interest.



Video 1 From darkness to brightness: the cholangioscopy-guided selective biliary cannulation with the help of a transparent hood during ERCP.

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