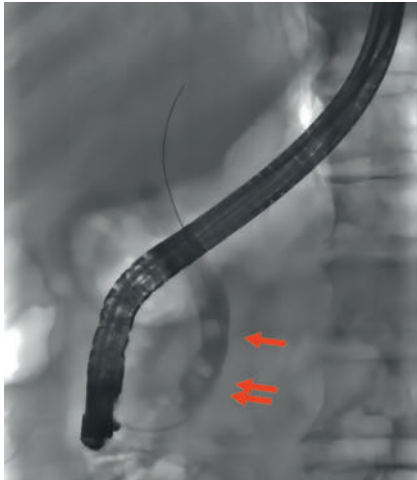
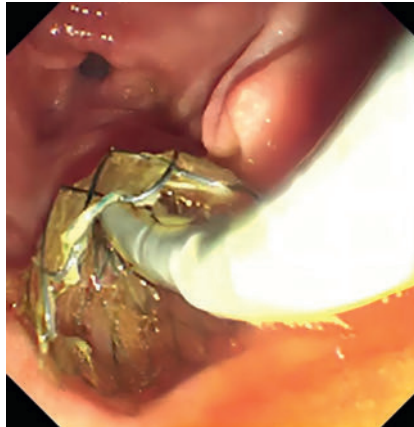


Cholangioscopy-assisted extraction of choledocholithiasis through novel papillary support: the protective effect on the sphincter of Oddi

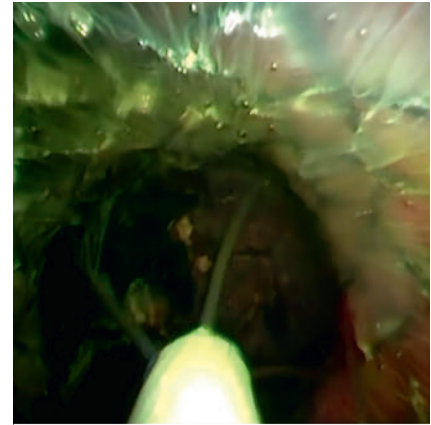
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► **Fig. 1** Endoscopic retrograde cholangiopancreatography fluoroscopic image showing multiple stones (maximum diameter of 10 mm, arrows) in the lower common bile duct (12 mm).



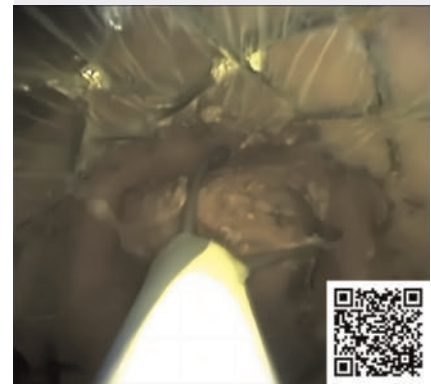
► **Fig. 2** The papillary support was inserted into the distal common bile duct.



► **Fig. 3** Stones were extracted with a basket under the cholangioscopy through papillary support.



► **Fig. 4** Sphincter of Oddi manometry was performed.



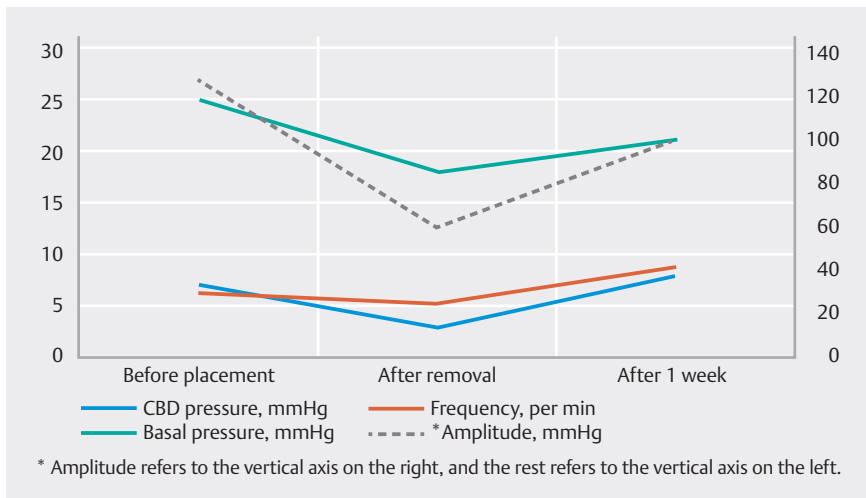
► **Video 1** Cholangioscopy-assisted extraction was performed through novel papillary support for choledocholithiasis.

A 78-year-old man with choledocholithiasis underwent cholangioscopy-assisted extraction for multiple stones with a maximum diameter of 10 mm (► **Fig. 1**). Considering the potential loss of sphincter of Oddi (SO) function associated with endoscopic sphincterotomy and endoscopic papillary balloon dilation, we used novel papillary support to provide an adequate exit for the extraction of the stones [1, 2]. The papillary support (12 mm in diameter, 25 mm in length) is a metal-covered membrane stent with a unique single dumbbell-style design on the papillary side, serving to protect the support from entering the common bile duct (CBD) during stone removal procedures [3]. After biliary intubation, the papillary support was inserted into the distal CBD to facilitate stone removal. The cholangioscopy (eyeMax, 9F; Micro-Tech, Nanjing, China) was inserted into the CBD through the papillary support (► **Fig. 2**). Then the stones were found directly under cholangioscopy. Stone extraction was accomplished using a basket (► **Fig. 3**). Subsequently, the papillary support was re-

moved, and a biliary plastic stent (7F, 6 cm) was placed in the CBD (► **Video 1**). Notably, no postoperative pancreatitis, bleeding, or other adverse events were observed.

In this case, we conducted sphincter of Oddi manometry (SOM) both before and after the placement of the papillary support (► **Fig. 4**). The patient exhibited normal SO function before the procedure. However, after removing the papillary support, there was an immediate decline in CBD pressure, SO basal pressure, amplitude, and frequency of contractions

(► **Fig. 5**). One week later, the stent was spontaneously removed, and we conducted SOM again to evaluate SO function. The SO basal pressure, amplitude, and frequency of contractions had recovered to normal range (► **Fig. 5**, ► **Video 1**). This encouraging outcome introduces a new method to preserve SO function. Further investigation is necessary to validate the safety and effectiveness of this technique.



* Amplitude refers to the vertical axis on the right, and the rest refers to the vertical axis on the left.

► **Fig. 5** Sphincter of Oddi pressure before and after the placement of the papillary support, as well as after 1 week.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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