

## Technical aspects of transpapillary biopsy for gallbladder cancer using a novel cholangioscope

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► **Fig. 1** Novel cholangioscope (eyeMAX, Micro-Tech, China) with an extremely tapered tip.



► **Fig. 2** Cholangiography showing a filling defect with a characteristic appearance of a tumor.



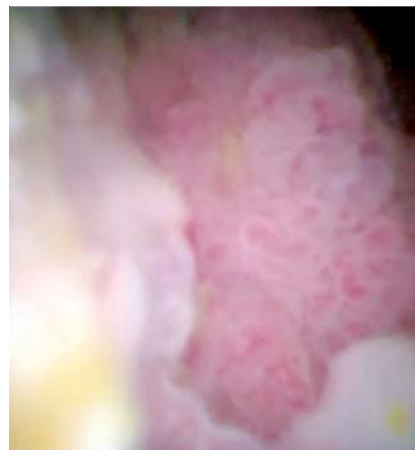
► **Fig. 3** Visualization of the gallbladder from the novel cholangioscope.

Cytology of bile juice obtained under endoscopic retrograde cholangiopancreatography (ERCP) guidance is the gold standard technique for obtaining histopathological evidence of gallbladder cancer. However, the diagnostic yield of this technique is insufficient. Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) has recently been performed for gallbladder lesions. However, because the gallbladder has a lumen, inadequate EUS-FNA can lead to bile leakage or cancer cell dissemination [1, 2]. Therefore, it is sometimes difficult to obtain histological tissue samples from gallbladder tumors. Although transpapillary gallbladder tumor biopsy under cholangioscopy guidance may be useful, the insertion of a cholangioscope into the gallbladder through the cystic duct is challenging. The recent introduction of a novel tapered cholangioscope (eyeMAX, Micro-Tech, China) may address these challenges (► **Fig. 1**). The tip of this scope is significantly tapered, facilitating its smooth insertion into the target site. In addition, the scope features a working channel of 1.8mm and a dedicated biopsy forceps,

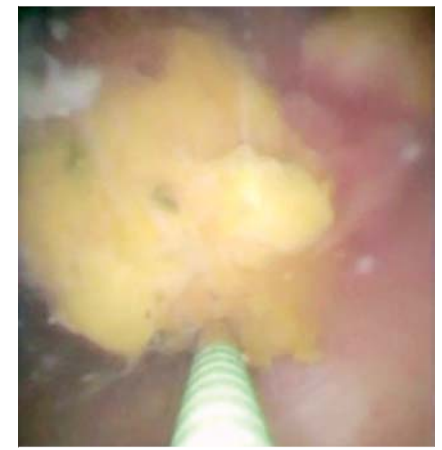
with a cup length of 1.6mm, which enables the retrieval of large quantities of histological tissue. Herein we describe the technical aspects of the use of this scope for performing transpapillary biopsy of gallbladder cancer.

First, following successful biliary cannulation, an ERCP catheter was inserted into the cystic duct. Then, contrast medium was injected and cholangiography was performed, revealing a filling defect with the appearance of a gallbladder tumor (► **Fig. 2**). Then, a guidewire was successfully inserted in the gallbladder, followed by the insertion of the novel cholangioscope into the gallbladder (► **Fig. 3**). Once the gallbladder tumor was visualized (► **Fig. 4**), forceps biopsy was performed without any adverse events (► **Fig. 5**, ► **Video 1**). Histological analysis of the biopsy specimen identified the mass as adenocarcinoma. Following surgical resection, the patient's diagnosis was confirmed as gallbladder cancer.

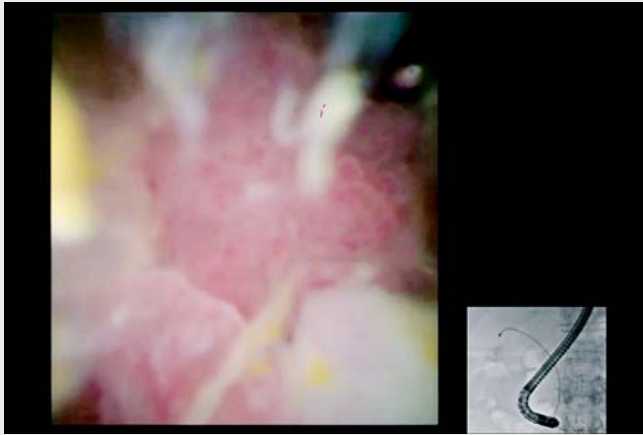
In conclusion, the tapered shape of the novel eyeMAX cholangioscope makes it a viable option for performing trans-



► **Fig. 4** Identification of the gallbladder tumor on cholangioscopy.



► **Fig. 5** Tumor biopsy was performed successfully.



**Video 1** Forceps biopsy of a gallbladder tumor performed under cholangioscopy guidance using a novel cholangioscope.

papillary biopsy to obtain a histological diagnosis of gallbladder lesions.

Endoscopy\_UCTN\_Code\_TTT\_1AR\_2AD

### Competing interests

The authors declare that they have no conflict of interest.

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Endoscopy 2023; 55: E1085–E1086

DOI 10.1055/a-2173-7893

ISSN 0013-726X

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