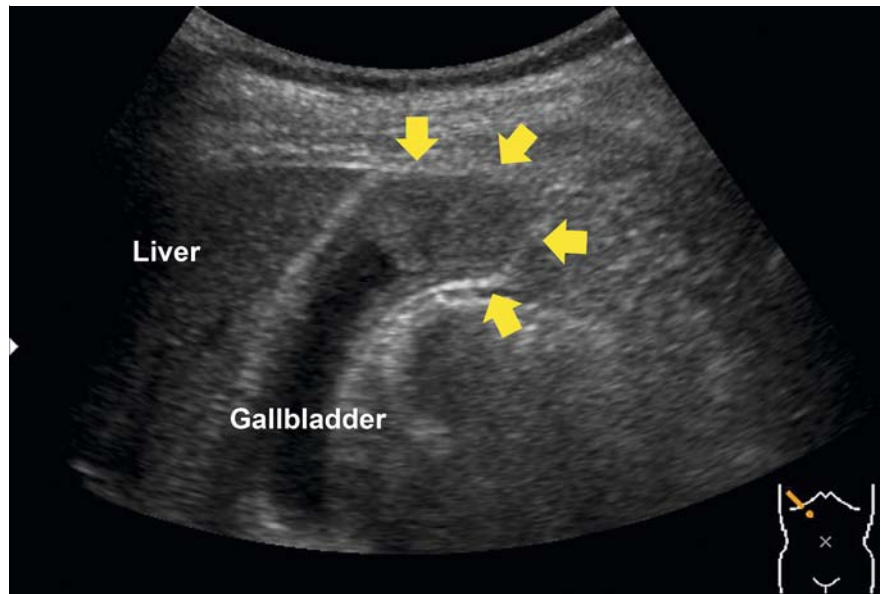


A novel technique for performing gallbladder tumor biopsy using a stent delivery system and biopsy forceps

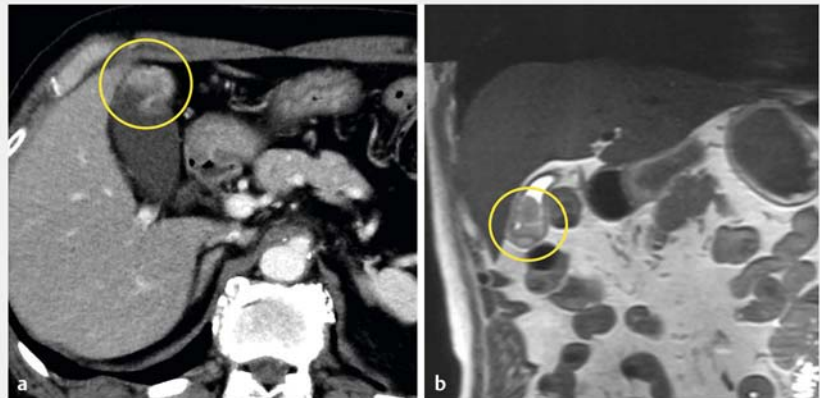
A 79-year-old man presented to our hospital with a gallbladder tumor diagnosed using abdominal ultrasonography (AUS). AUS, contrast-enhanced computed tomography, and magnetic resonance imaging showed a protruded lesion at the gallbladder fundus (► **Fig. 1**, ► **Fig. 2**). Endoscopic retrograde cholangiography (ERC) was performed, and cholecystography revealed a contrast agent defect at the gallbladder fundus (► **Fig. 3**).

We placed a 0.025-inch guidewire into the gallbladder and inserted a biliary stent delivery system, composed of a guide catheter and pusher tube (MAJ-510; Olympus Medical Systems, Tokyo, Japan) (► **Fig. 4**). After removing the guidewire and guide catheter, we inserted biopsy forceps (radial Jaw 4 Pediatric Biopsy Forceps; Boston Scientific Japan, Tokyo, Japan) through the pusher tube and performed biopsy of the gallbladder fundus lesion (► **Video 1**). The biopsy specimen was sufficient to diagnose gallbladder cancer (► **Fig. 5**). Tumor recurrence was not seen for 3 years after surgery.

Although other endoscopic methods for diagnosing gallbladder cancers have been previously reported [1–3], use of biopsy forceps specimens for diagnosing gallbladder cancer is novel to our knowledge. We have previously reported the utility of a biliary stent delivery system in removing a foreign body from the bile duct [4, 5]. The technique used here enabled us to insert biopsy forceps into the gallbladder safely and easily, and to obtain a sufficient biopsy sample. Moreover, this method may contribute to reducing complications after ERC, such as acute pancreatitis and duodenal perforation caused by the biopsy forceps injuring the duodenal papilla. Careful and accurate biopsy is important for prevention of gallbladder perforation. We placed an endoscopic naso-gallbladder drainage tube at the end of this procedure to reduce the



► **Fig. 1** Abdominal ultrasonography of gallbladder cancer, showing a protruded lesion (yellow arrowheads) at the gallbladder fundus



► **Fig. 2** Imaging studies of gallbladder cancer showing a tumor lesion (yellow circle) at the gallbladder fundus. **a** Contrast-enhanced computed tomography. **b** Magnetic resonance imaging.

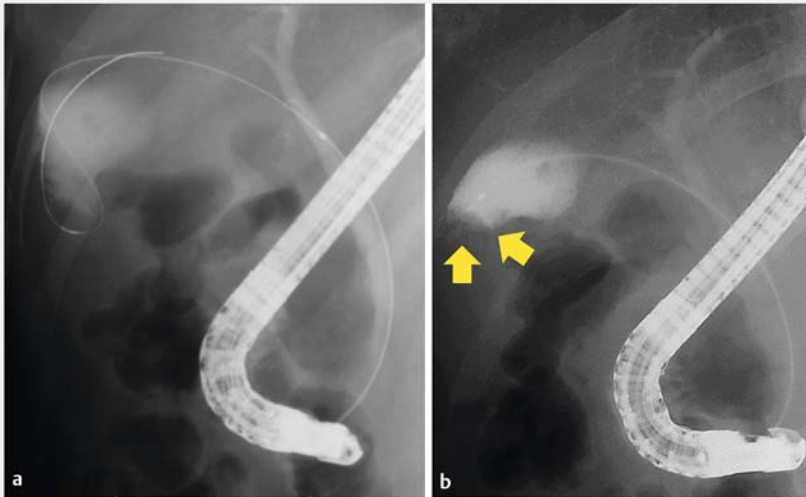
bile juice leakage in case of gallbladder perforation.

In conclusion, we report a novel technique to obtain a sample of the gallbladder using a stent delivery system using a biopsy forceps.

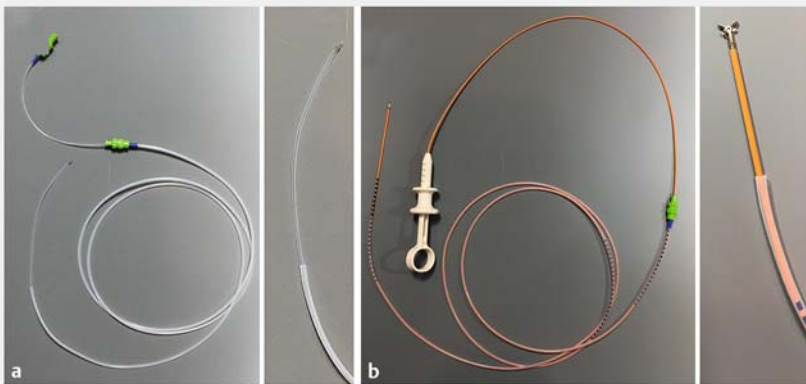
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Competing interests

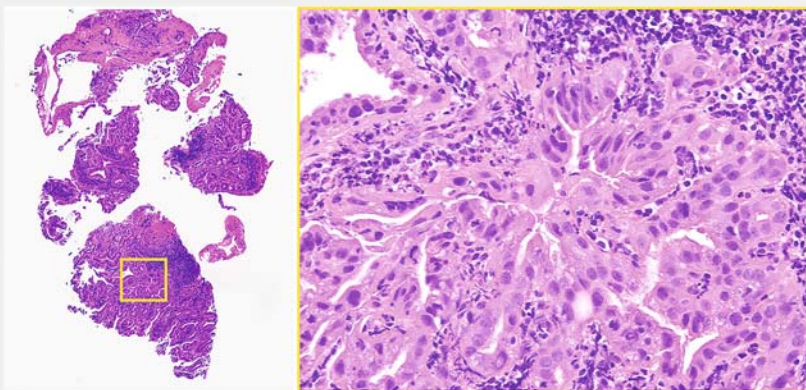
The authors declare that they have no conflict of interest.



► **Fig. 3** Endoscopic retrograde cholangiography. **a** A guidewire was inserted into the gallbladder. **b** Contrast agent defect (yellow arrows) was observed at the gallbladder fundus.



► **Fig. 4** The biliary stent delivery system, composed of a guide catheter and pusher tube (MAJ-510; Olympus Medical Systems, Tokyo, Japan). **a** The biliary stent delivery system. **b** Biopsy forceps.



► **Fig. 5** Hematoxylin and eosin staining of gallbladder cancer. The specimen was obtained from the gallbladder tumor using biopsy forceps. The histological diagnosis was adenocarcinoma.

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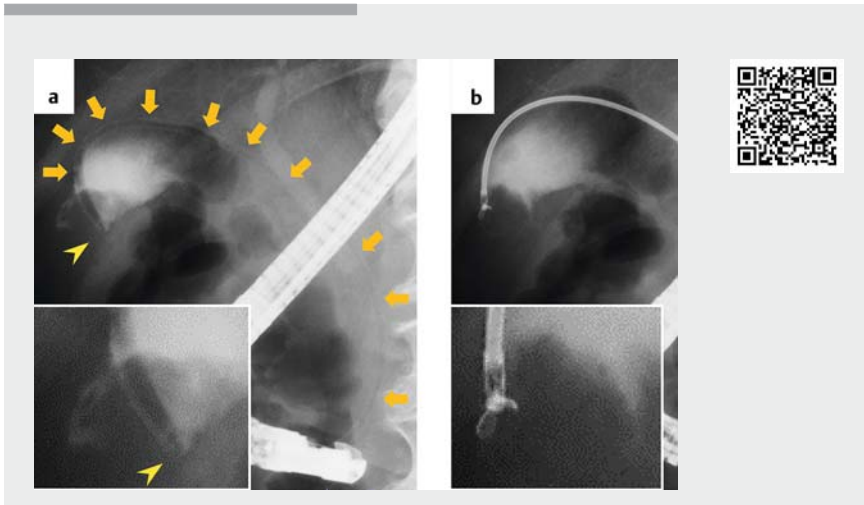
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Video 1 Biopsy of gallbladder tumor. **a** A pusher tube was inserted into the gallbladder (orange arrows) and the tip of the tube (yellow arrowhead) was located at the gallbladder tumor. **b** Biopsy forceps was inserted into the gallbladder through the pusher tube.

Bibliography

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