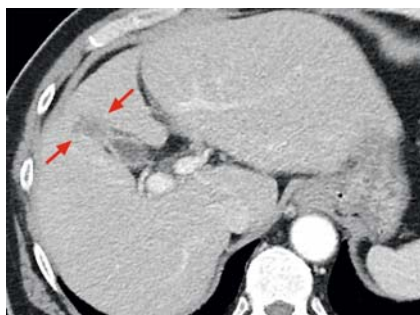


## Introducer-assisted endoscopic transpapillary gallbladder biopsy for indeterminate gallbladder fundal wall thickness

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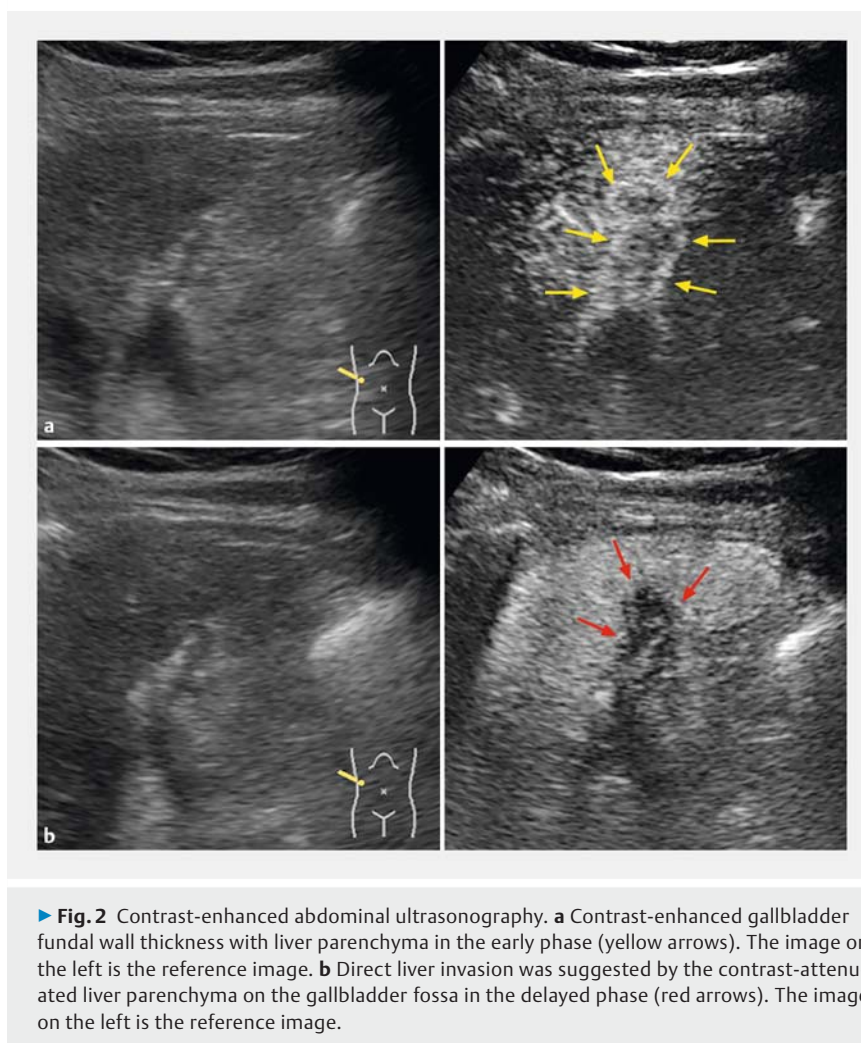


► **Fig. 1** Contrast-enhanced abdominal computed tomography performed at admission revealed contrast-enhanced gallbladder fundal wall thickness with an obscure demarcation line of the liver parenchyma and gallbladder fossa (red arrows).

Endoscopic transpapillary gallbladder biopsy (ET-GBBx) remains challenging; therefore, there is no recommendation for the histological examination of patients with resectable gallbladder cancer [1,2]. Endoscopic introducer-assisted procedures recently emerged for pancreatico-biliary interventions [3]. This article describes the use of introducer-assisted ET-GBBx for indeterminate gallbladder fundal wall thickening.

A 69-year-old man was referred to our department with gradual deterioration of gallbladder fundal wall thickness (► **Fig. 1**) and an increased serum carbohydrate antigen 19–9 level of 88U/mL. Abdominal ultrasonography after a perflubutane injection revealed early contrast-enhanced fundal wall thickening of the gallbladder and liver parenchyma. Delayed contrast-attenuated liver parenchyma on the gallbladder fossa indicated direct liver invasion (► **Fig. 2**). The patient requested a definitive pathological diagnosis, and ET-GBBx was performed after a multidisciplinary discussion.

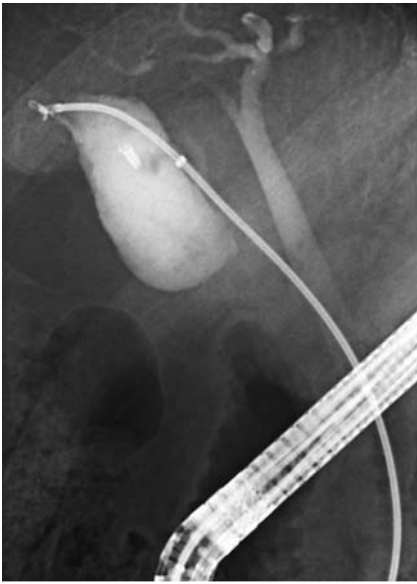
After guidewire coiling of the gallbladder, ET-GBBx using peroral cholangioscopy (POCS – SpyGlass DS System; Boston



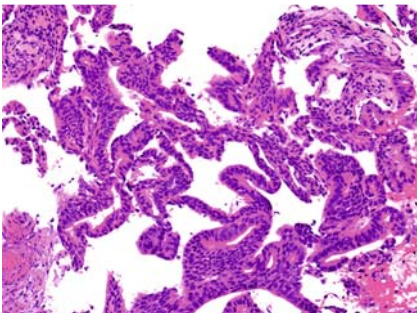
► **Fig. 2** Contrast-enhanced abdominal ultrasonography. **a** Contrast-enhanced gallbladder fundal wall thickness with liver parenchyma in the early phase (yellow arrows). The image on the left is the reference image. **b** Direct liver invasion was suggested by the contrast-attenuated liver parenchyma on the gallbladder fossa in the delayed phase (red arrows). The image on the left is the reference image.

Scientific, Marlborough, Massachusetts, USA) [4] was attempted; however, an obstruction was noted at the cystic duct despite dilation using a drill dilator. Next, we attempted fluoroscopy-guided ET-GBBx using biopsy forceps (Radial Jaw 4P; Boston Scientific) through the outer sheath of the endoscopic introducer (EndoSheather; Piolax, Yokohama, Japan) without complications (► **Fig. 3**, ► **Video 1**). Histologically, all three specimens were adenocarcinoma (► **Fig. 4**); thus, an extended radical cholecystectomy was performed.

The potential of ET-GBBx using small biopsy forceps has been reported [5]; however, that study carried the risk of sampling errors due to its small sample size. This endoscopic introducer functions as a dilator and a delivery sheath for instruments, including large biopsy forceps up to 1.9 mm (5.7Fr) in diameter. However, dedicated devices such as rotatable and bendable biopsy forceps are warranted for whole-gallbladder biopsy. These findings indicate that ET-GBBx is feasible for gallbladder fundus lesions unless an ultra-slim POCS is developed



► **Fig. 3** Endoscopic transpapillary gallbladder biopsy using biopsy forceps under fluoroscopic guidance. Biopsy forceps were passed through the outer sheath of the endoscopic introducer to the gallbladder fundus.



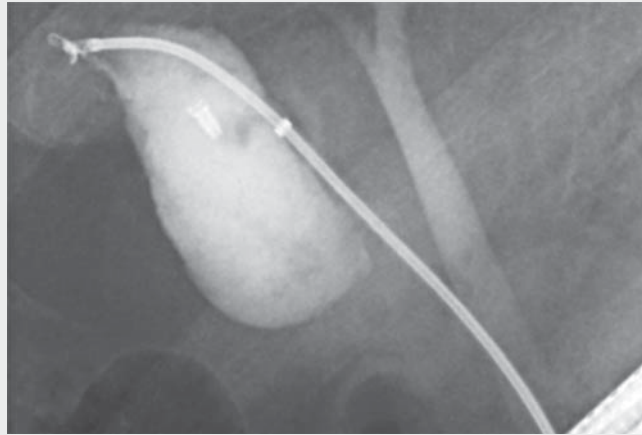
► **Fig. 4** Microscopic findings of a specimen obtained from the gallbladder fundus. Severe atypical columnar cells with loss of polarity, nuclear enlargement, and stratification indicated a tubulo-papillary growth pattern. Histologically, the diagnosis was adenocarcinoma. Hematoxylin and eosin staining.

and advanced through the spiral valve of Heister.

Endoscopy\_UCTN\_Code\_TTT\_1AR\_2AD

### Competing interests

The authors declare that they have no conflict of interest.



► **Video 1** Introducer-assisted endoscopic transpapillary gallbladder biopsy for indeterminate gallbladder fundal wall thickness.

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