

## Contrast-enhanced harmonic endoscopic ultrasound-guided drainage of a postoperative pancreatic fistula

The effectiveness of endoscopic ultrasound (EUS)-guided drainage of a postoperative pancreatic fistula (POPF) has been reported [1–3]. It is sometimes difficult to distinguish a POPF from surrounding organs and tissues because echogenicity of necrotic or infected tissue becomes as high as that of surrounding tissue in a POPF. Contrast-enhanced harmonic EUS (CH-EUS) may help to identify the spread of a POPF. Here, we present a video case of CH-EUS-guided drainage of a POPF after pancreaticoduodenectomy.



► **Fig. 1** Contrast-enhanced computed tomography showed that there was fluid collection around the pancreas (yellow arrowheads).

A 66-year-old man with bile duct cancer underwent pancreaticoduodenectomy at our hospital. Eighteen days later, he developed abdominal pain and high fever due to POPF. Contrast-enhanced computed tomography detected a POPF (50×25 mm) around the pancreas (► **Fig. 1**). We attempted EUS-guided drainage; however, the spread of the POPF could not be identified by fundamental B-mode EUS. There was no anechoic lesion, but a high echoic area around the pancreas. Therefore, we performed CH-EUS to identify the spread of the POPF. Fifteen seconds after infusion of 0.7 mL contrast agent, the avascular area of the high echoic area was identified in a CH-EUS image (► **Fig. 2**, ► **Video 1**). The POPF was punctured using a 19-gauge needle under CH-EUS, and its lumen was recognized by injecting contrast medium via this needle. A 0.025-inch guidewire was inserted through the needle and coiled into the POPF. The needle was withdrawn and the guidewire was left inside the POPF. A 7-Fr endoscopic nasobiliary drainage tube was deployed into the POPF for drainage.

Abdominal pain improved and the size of the POPF and amount of pancreatic juice drained via the external tube decreased (► **Fig. 3**). Ten days later, we cut the external drainage tube, dropped it into the stomach (► **Fig. 4**), and used it as an internal catheter for POPF drainage because clinical improvement had been observed.

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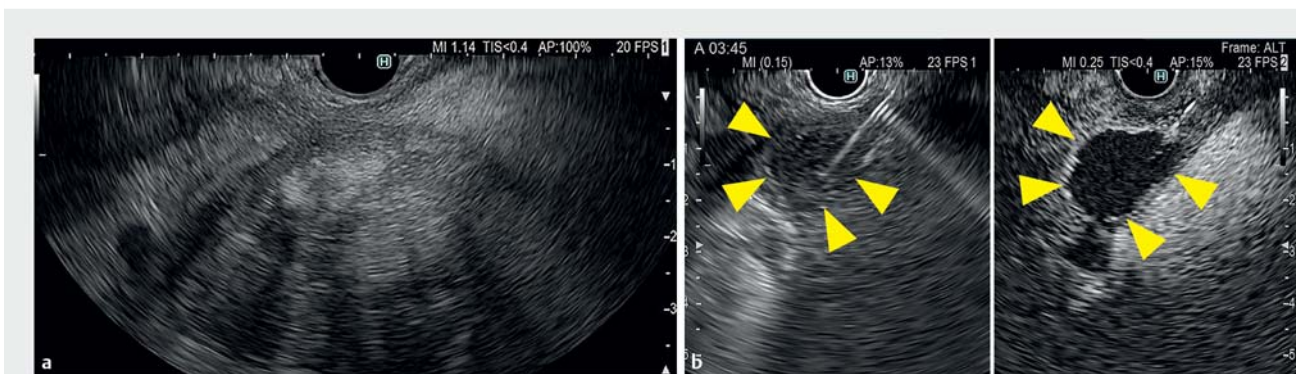
### Competing interests

None

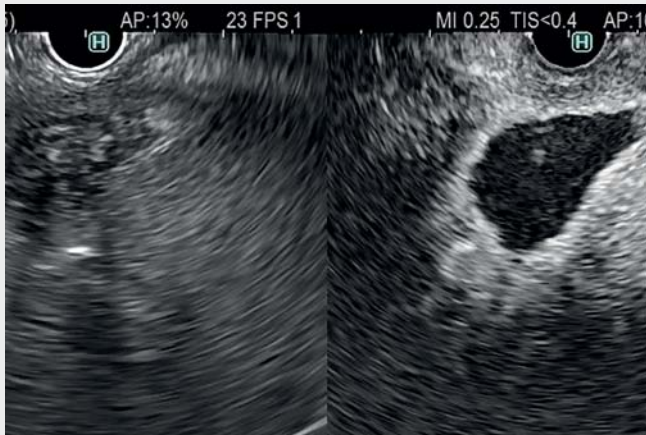
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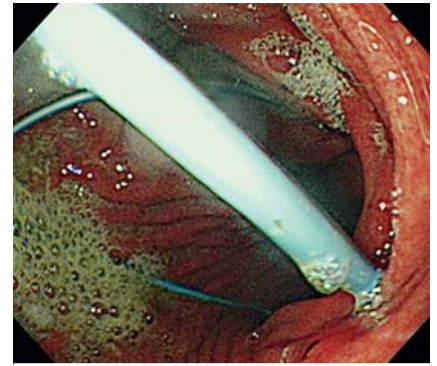
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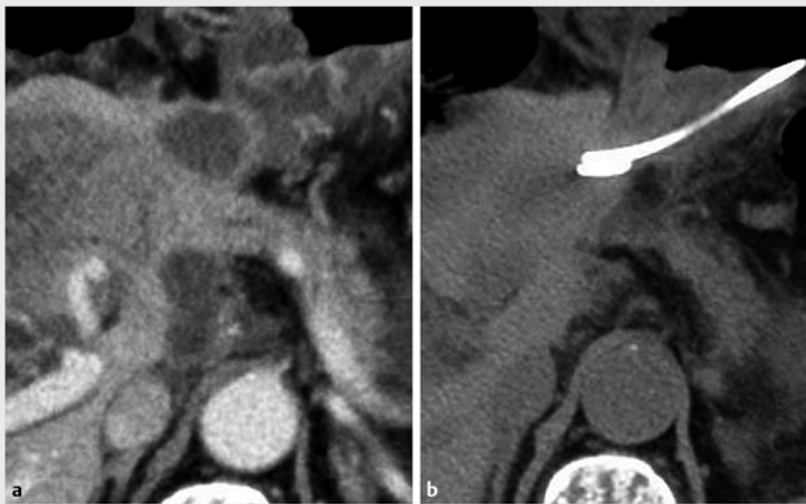
► **Fig. 2** Endoscopic ultrasound images. **a** A heterogeneous high echoic area without anechoic lesion was observed on a fundamental B-mode image. **b** An avascular area with a sharp margin (yellow arrowheads) was seen on a contrast-enhanced harmonic image. The postoperative pancreatic fistula was punctured with a 19-gauge needle under guidance of contrast-enhanced harmonic endoscopic ultrasound.



▶ **Video 1** Contrast-enhanced harmonic endoscopic ultrasound-guided drainage of a postoperative pancreatic fistula.



▶ **Fig. 4** Endoscopy image showing the external drainage tube after it was dropped into the stomach.



▶ **Fig. 3** Contrast-enhanced computed tomography images. **a** Before endoscopic ultrasound (EUS)-guided drainage, showing fluid collection around the pancreas. **b** At 10 days after performing EUS-guided drainage, showing that the fluid collection around the pancreas had resolved.

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## Bibliography

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