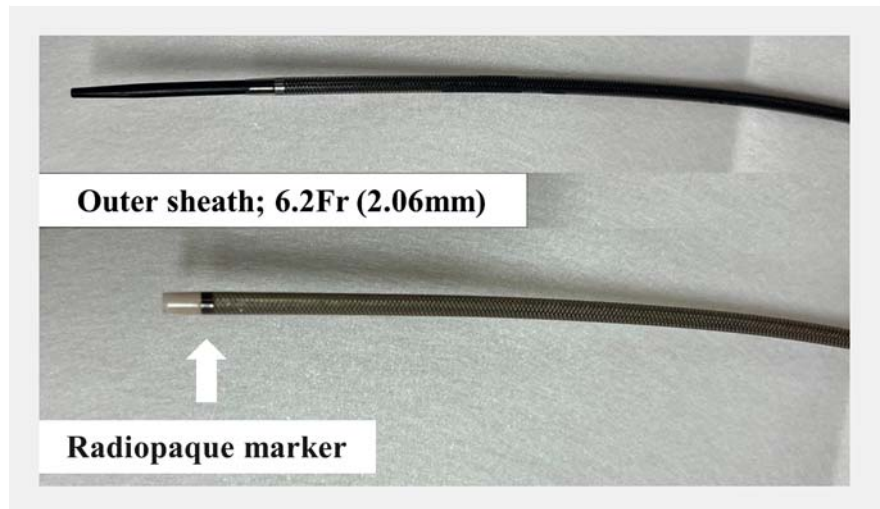




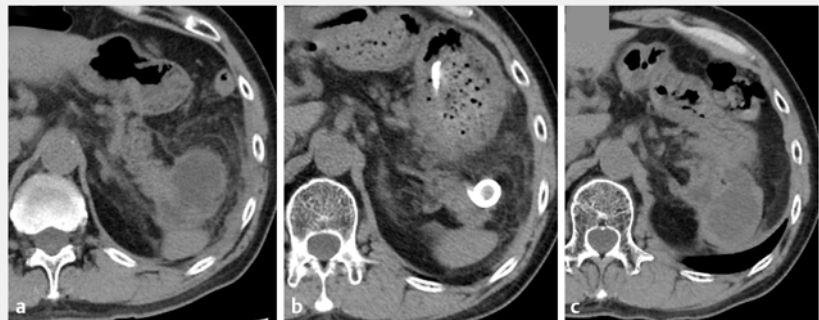
Successful re-intervention using endoscopic ultrasound-guided drainage via an endoscopic tapered sheath for recurrent walled-off necrosis with fibrosis

Patients with disconnected pancreatic duct syndrome recur with pancreatic fluid collection in 17–38% of cases after transmural stent removal [1, 2]. Symptomatic patients require endoscopic re-intervention; however, an approach via the same puncture route is often complicated by fibrosis caused by previous treatment. Long-term placement of a plastic stent is recommended for endoscopic ultrasound-guided drainage of a recurrent walled-off necrosis (WON). However, commonly used pigtail stents are difficult to pass through a fistula even post-dilation, especially in fibrotic cases. Lumen-apposing metal stents can be easily employed in such cases, albeit with an increased risk of serious adverse events in long-term placements [3, 4]. We report a successful re-intervention using endoscopic ultrasound-guided drainage via an endoscopic tapered sheath (EndoSheather; Piolax, Inc., Kanagawa, Japan) (► Fig. 1) for a recurrent WON with fibrosis.

A 55-year-old man with a previously resolved WON and subsequent transmural stent removal visited our hospital with complaints of high-grade fever and abdominal pain. He was diagnosed with WON recurrence by computed tomography (► Fig. 2), followed by endoscopic ultrasound-guided drainage (► Video 1). The procedure involved a WON puncture using a 19-gauge needle and 0.025-inch guidewire, followed by an unsuccessful attempt at catheter insertion into the WON over the guidewire. This was circumvented by breaking the WON wall with a 7-Fr dilator. Thereafter, an endoscopic tapered sheath was inserted, followed by placement of two guidewires. Subsequently, balloon dilatation and placement of a 7-Fr plastic stent were carried out; however, attempts to place the second external drainage tube were unsuccessful. Therefore, we used an endoscopic tapered sheath. As a result, we



► Fig. 1 The endoscopic tapered sheath. The internal diameter of the outer sheath was 6.2 Fr (2.06 mm), which permitted insertion of medical equipment of up to \varnothing 1.9 mm. The outer sheath tip had a radiopaque marker.



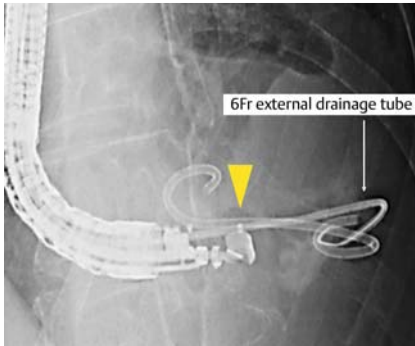
► Fig. 2 Clinical course of walled-off necrosis as visualized by computed tomography examination. **a** Status prior to first treatment 1 year ago. **b** Status post-resolution of walled-off necrosis (WON). **c** Recurrence of WON.

easily placed a 6-Fr external drainage tube via this device (► Fig. 3). This device allows easy insertion of medical equipment (up to \varnothing 1.9 mm) through outer sheath (► Fig. 4). By using this endoscopic tapered sheath, a plastic stent can be easily placed without being affected by fibrosis.

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Competing interests

The authors declare that they have no conflict of interest.



► **Fig. 3** Fluoroscopic images. A 6-Fr external drainage tube was placed via the endoscopic tapered sheath. The yellow arrow indicates a radiopaque marker on the outer sheath tip.

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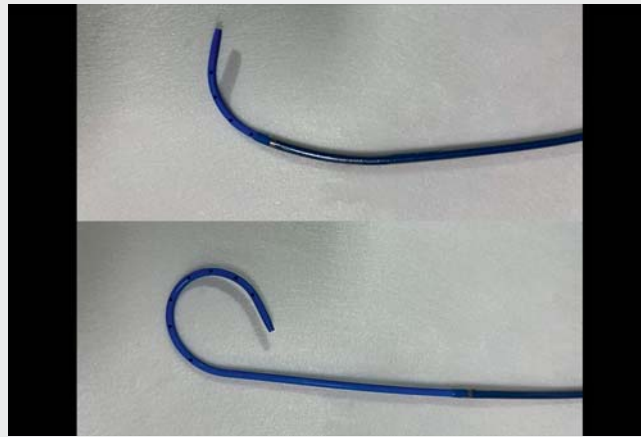
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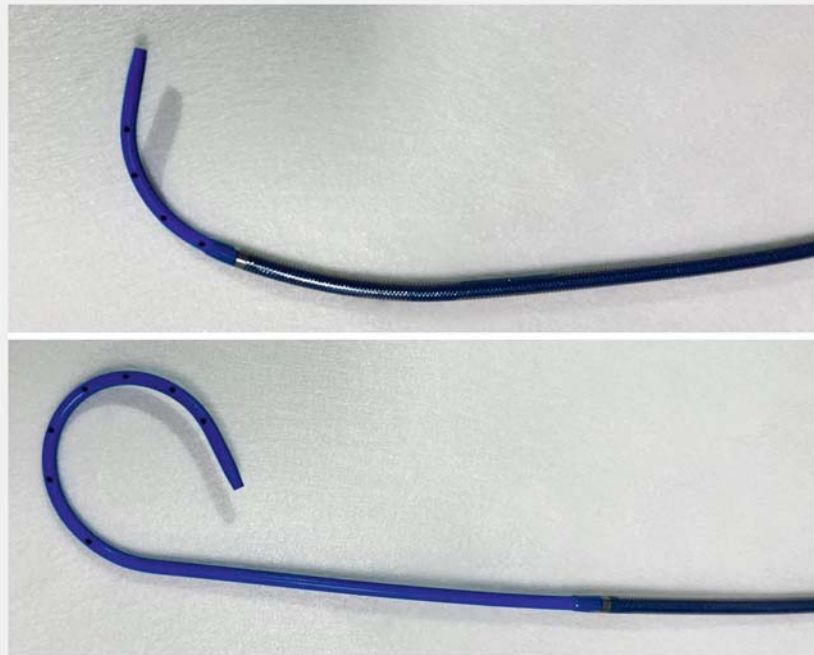
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► **Video 1** Successful re-intervention with endoscopic ultrasound-guided drainage via an endoscopic tapered sheath for recurrent walled-off necrosis with fibrosis.



► **Fig. 4** Insertion of a 6-Fr external drainage tube via the outer sheath.

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