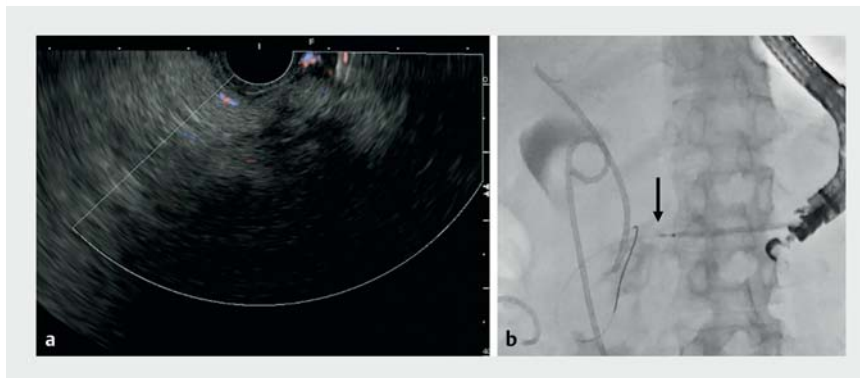


## To-and-fro balloon technique for deployment of a lumen-apposing metal stent in highly solid walled-off necrosis of the pancreas

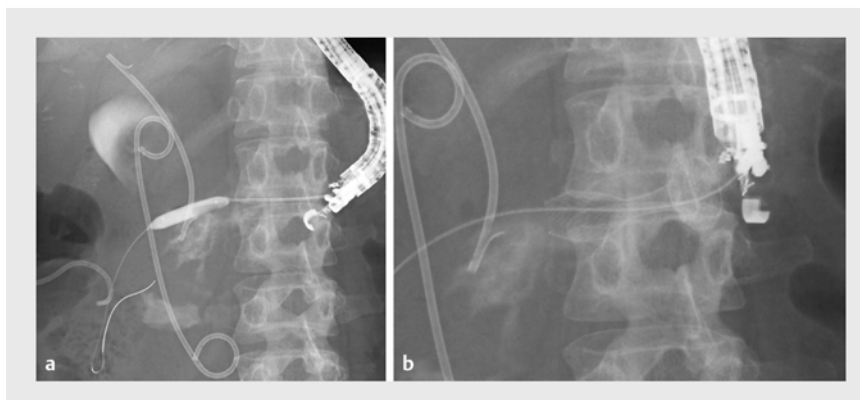


► **Fig. 1** Computed tomography delineating a large walled-off necrosis lesion.

Lumen-apposing metal stents (LAMSs) have revolutionized endoscopic treatment of walled-off necrosis (WON) by allowing for effective drainage and subsequent endoscopic necrosectomy [1, 2]. However, it may be technically challenging to deploy a LAMS for a WON with little fluid content [3], which potentially inhibits insertion of the delivery and expansion of the distal stent flange [4]. A 38-year-old woman was referred to our department for endoscopic management of an infected WON due to biliary pancreatitis (► **Fig. 1**). Although endoscopic ultrasound (EUS)-guided drainage was performed in the previous hospital, the infection did not subside owing to incomplete drainage; therefore, we decided to place a LAMS with a cauterly-enhanced delivery system (HOT AXIOS; Boston Scientific Japan, Tokyo, Japan). EUS revealed a WON with few fluid components (► **Fig. 2 a**), and we decided to perform a wire-guided placement of the LAMS. We punctured the WON with a 19-gauge needle (EZshot3; Olympus Medical, Tokyo, Japan) via the transgastric approach and inserted the stent delivery over a 0.025-inch guidewire (VisiGlide2; Olympus). Owing to the limited space due to the highly solid cavity, the delivery could not be advanced (► **Fig. 2 b**). Therefore, we withdrew the delivery and inserted an 8-mm balloon dilator (REN; Kaneka Med-



► **Fig. 2** Failed insertion of a lumen-apposing metal stent (LAMS) in a case with highly solid walled-off necrosis (WON). **a** Endosonographic view demonstrating few fluid components within the cavity of the WON. **b** Failed insertion of the LAMS delivery (arrow).



► **Fig. 3** The to-and-fro balloon technique opening up space for the lumen-apposing metal stent (LAMS). **a** Dilatation balloon being moved to and fro within the cavity of the walled-off necrosis. **b** LAMS with fully expanded flanges due to the ballooned cavity.

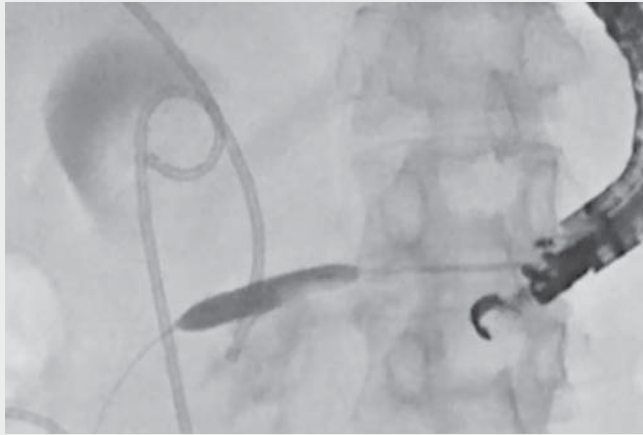
ix, Tokyo, Japan) into the WON cavity. We attempted to open up enough space for the LAMS by moving the dilated balloon to and fro (► **Fig. 3 a**). We successfully deployed the LAMS with adequate expansion of the flanges (► **Fig. 3 b**). On the second day of the procedure, radiograph delineated full expansion of the flanges. After subsequent sessions of endoscopic necrosectomy via the LAMS, complete resolution of the WON was achieved. Inadequate expansion of the LAMS flanges may result in adverse events including stent migration and bleeding [5]. The

to-and-fro balloon technique presented here (► **Video 1**) would further expand the indications of the LAMS for a symptomatic WON.

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### Competing interests

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**Video 1** The to-and-fro balloon technique for deployment of a lumen-apposing metal stent in a highly solid walled-off necrosis.

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\* These authors are members of the WONDERFUL (WON and peripancreatic fluid collection) study group in Japan.