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Troubleshooting for difficult removal of a stent delivery system after endoscopic ultrasound-guided hepaticogastrostomy

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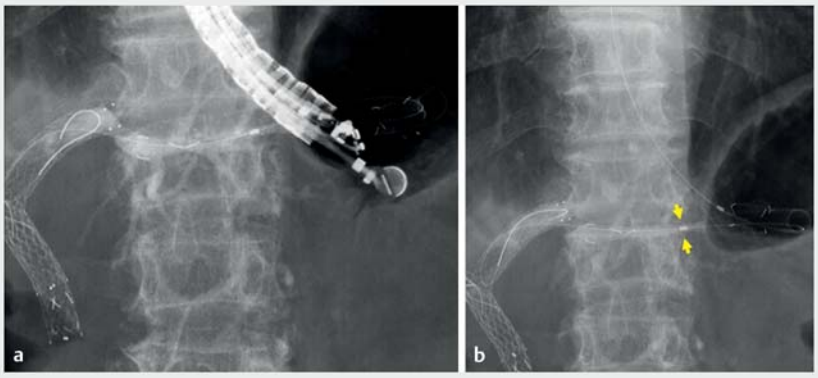
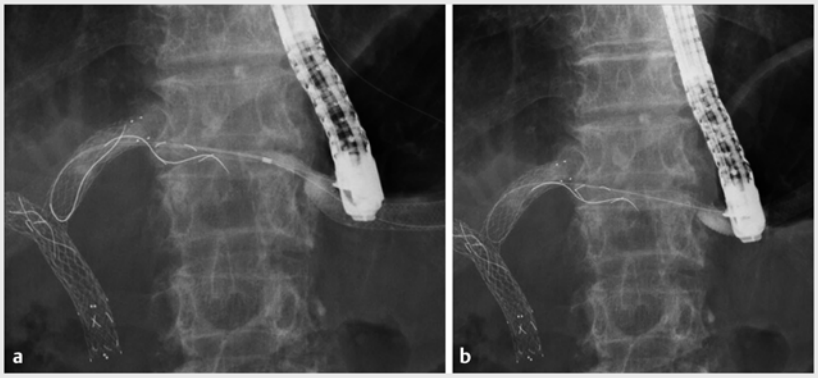


▶ **Fig. 1** Endoscopic ultrasound-guided hepaticogastrostomy. **a** Stent deployment was successfully performed. **b** The stent delivery system could not be removed owing to insufficient stent expansion (arrows).

▶ **Fig. 2** The stent delivery system was cut close to the patient's mouth using pliers.



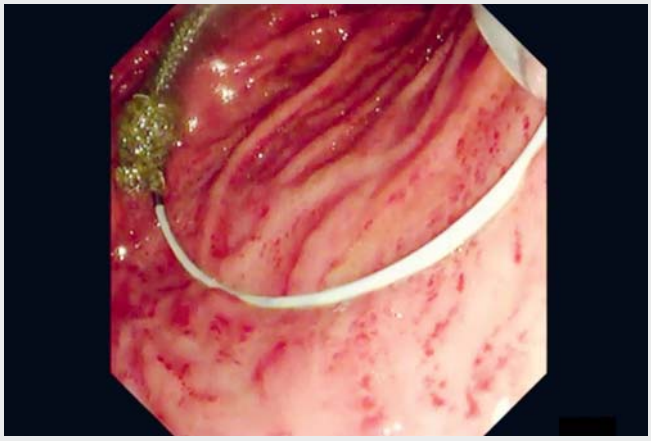
▶ **Fig. 3** Removal of the delivery system. **a** After guidewire insertion, balloon dilation was performed at the site of insufficient stent expansion. **b** The stent delivery system was successfully removed.

Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) is now widely performed for patients in whom endoscopic retrograde cholangiopancreatography is unsuccessful [1–4]. Various technical tips have been reported for preventing adverse events and improving the technical success rate before stent deployment. We herein describe a troubleshooting technique for difficult removal of the stent delivery system after EUS-HGS stent deployment.

A 77-year-old woman was admitted for treatment of obstructive jaundice due to unresectable hepatic hilar carcinoma. Multiple uncovered self-expandable metal stents (UCSEMSs) were inserted and systemic chemotherapy was attempted; however, recurrent biliary obstruction was observed after 6 months. Reintervention using UCSEMS was then performed for the left, anterior, and posterior bile ducts, but biliary obstruction recurred after 4 months. Further reintervention was successful for the right hepatic bile duct but failed for the left hepatic bile duct. Therefore, EUS-HGS was attempted.

The intrahepatic bile duct was punctured using a 19 G needle. After injection of contrast medium, a 0.025-inch guidewire was deployed. Tract dilation was performed using a drill dilator. An 8.5 Fr stent delivery system was inserted and the stent was successfully deployed (8 mm × 12 cm, Spring Stopper stent; Taewoong Medical, Seoul, South Korea) (▶ **Fig. 1 a**). However, the stent delivery system could not be removed because of insufficient stent expansion (▶ **Fig. 1 b**). Therefore, the stent delivery system was cut close to the patient's mouth using pliers, and the echoendoscope was removed (▶ **Fig. 2**). A duodenoscope was inserted and a guidewire was inserted into the biliary tract through the EUS-HGS stent. After balloon dilation at the site of insufficient stent expansion (▶ **Fig. 3 a**), the stent delivery system was removed successfully without any adverse events (▶ **Fig. 3 b**, ▶ **Video 1**).

In cases of difficult removal of a stent delivery system due to insufficient stent expansion, additional dilation at the site



Video 1 Troubleshooting procedure in cases of difficult removal of a stent delivery system due to insufficient stent expansion.

of insufficiency may enable removal of the system.

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Competing interest

The authors declare that they have no conflict of interest.

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