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# Removal of a broken percutaneous transhepatic biliary drainage catheter by cholangioscopy through a lumen-apposing metal stent used for choledochoduodenostomy

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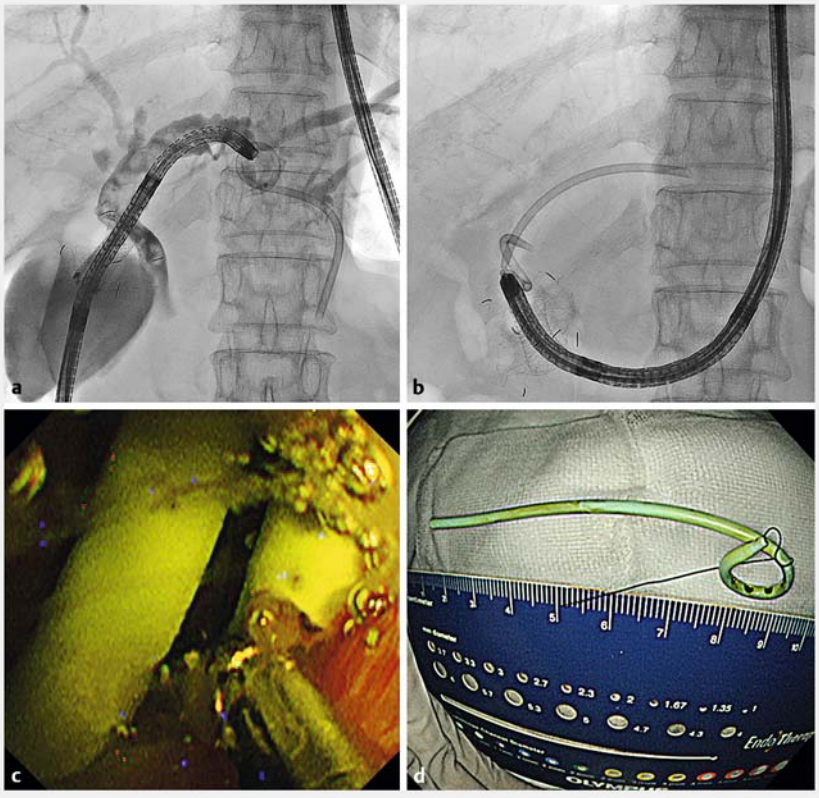
▶ **Fig. 1** Computed tomographic scan showing the broken percutaneous transhepatic biliary drainage catheter buried in the abdominal wall.




▶ **Fig. 2** Removal of the broken percutaneous transhepatic biliary drainage (PTBD) catheter by direct peroral cholangioscopy using a multibending ultraslim endoscope through a lumen-apposing metal stent (LAMS). **a, b** Radiographic images showing (**a**) insertion of the multibending ultraslim endoscope into the intrahepatic duct through the LAMS and (**b**) withdrawal of the PTBD catheter through the LAMS. **c** Endoscopic image of the PTBD catheter being grasped by a 2-mm forceps. **d** The successfully removed broken PTBD catheter.

Endoscopic ultrasound-guided choledochoduodenostomy (EUS-CDS) using a lumen-apposing metal stent (LAMS) is an alternative procedure for biliary decompression in patients with distal malignant biliary strictures [1–4]. Although this approach results in a new connecting passage into the bile duct, there are few reports of direct visualization into the bile duct through a LAMS used for CDS [5]. We present a procedure for the removal of a broken percutaneous transhepatic biliary drainage (PTBD) catheter through a LAMS used for CDS.

A 53-year-old woman with a history of schizophrenia was admitted with abdominal pain and jaundice. She had been diagnosed with pancreatic head cancer 1 month previously and underwent PTBD to decompress the malignant biliary strictures. Two days prior to admission, the patient had cut the PTBD catheter with a knife, after which she developed abdominal pain and jaundice. Computed tomography revealed the distal end of the broken catheter buried in the abdominal wall (▶ **Fig. 1**). Removal of the catheter via a percutaneous tract was not possible. Endoscopic retrograde cholangiopancreatography was also not possible, because pancreatic cancer had obstructed the second duodenal portion. Instead, EUS-CDS was performed using a LAMS (Spaxus; Taewoong Medical, Ilsan, South Korea). Four days later, direct peroral cholangioscopy using a multibending ultraslim endoscope (CHF-Y0010; Olympus Medical Systems, Tokyo, Japan) was performed through the LAMS (▶ **Fig. 2 a, b**). Endoscopy revealed the broken catheter in the left intrahepatic bile duct. The catheter was grasped using a 2-mm forceps (▶ **Fig. 2 c**) and successfully removed via endoscopic withdrawal through the LAMS (▶ **Fig. 2 d**; ▶ **Video 1**).

This report describes the safe removal of a broken PTBD catheter via peroral cholangioscopy after EUS-CDS. The LAMS served as a connection route enabling a less invasive approach. The creation of an anastomosis between the enteric and biliary systems using a LAMS not only allows biliary drainage but also provides access for advanced endoscopic intervention.

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**Video 1** Removal of a broken percutaneous transhepatic biliary drainage catheter by direct peroral cholangioscopy using a multibending ultraslim endoscope through a lumen-apposing metal stent used for choledochoduodenostomy.

## Competing interests

The authors declare that they have no conflict of interest.

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