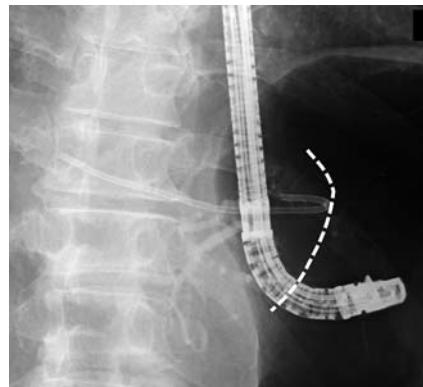


## Digital cholangioscopy-guided retrieval of a migrated hepaticogastrostomy stent through a created hepaticogastrostomy route

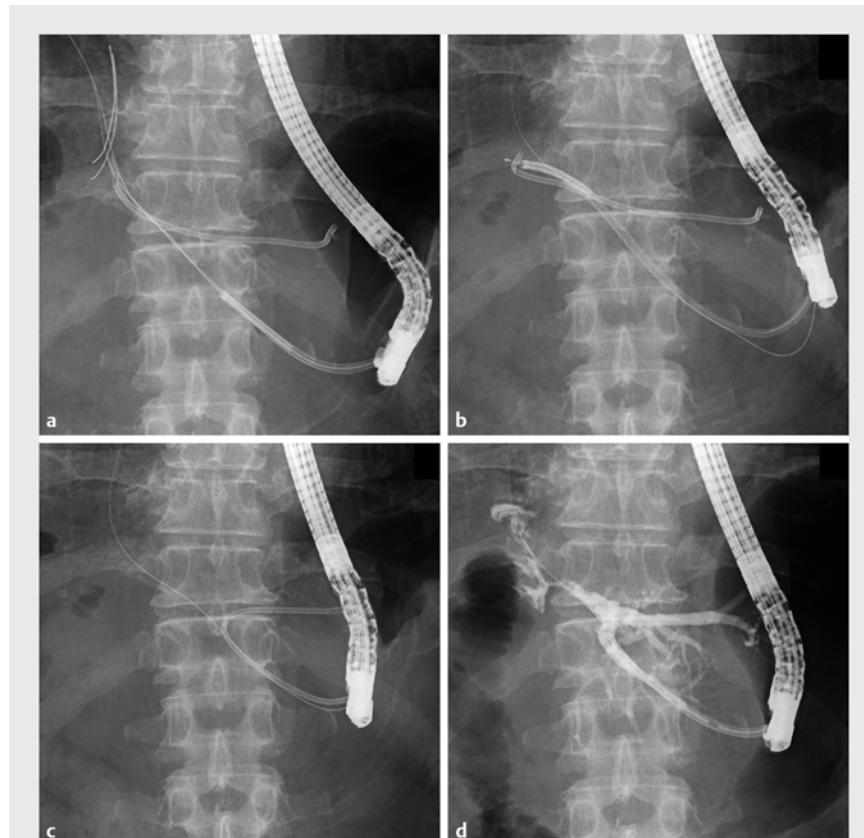


► Fig. 1 A migrated hepaticogastrostomy stent in the bile duct at segment 2. The dotted line represents the gastric wall.

Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) is increasingly utilized for benign biliary diseases in cases with surgically altered anatomy [1, 2], but stent migration is a potential complication [3]. We describe successful retrieval of a migrated hepaticogastrostomy stent through a newly created EUS-HGS route using a digital cholangioscope.

A 71-year-old man with a history of extended right hepatectomy for cholangiocarcinoma was referred for treatment of intrahepatic biliary stones. As stone extraction under enteroscope-assisted endoscopic retrograde cholangiopancreatography at an outside hospital failed due to multiple intrahepatic stones, we decided to perform EUS-HGS.

After plastic stent placement in the bile duct at segment 2, stone extraction was attempted through the fistula during the second session. Stone extraction was incomplete due to technical difficulty and large stone size, and therefore we planned to perform extracorporeal shock wave lithotripsy using a nasobiliary catheter. During nasobiliary catheter insertion following placement of a 7-Fr straight-type plastic stent as HGS, we discovered that the stent had migrated into the fistula tract due to interference between the



► Fig. 2 Retrieval of a migrated stent through a second hepaticogastrostomy fistula utilizing digital cholangioscopy. **a** The digital cholangioscope was advanced through a newly created hepaticogastrostomy fistula. **b** The migrated stent was grasped using a mini snare under digital cholangioscopic visualization. **c** The stent was successfully withdrawn to the stomach. **d** Fluoroscopic image of the biliary tree after removal of the stent and intrahepatic biliary stones.

two tubes (► Fig. 1). Although there was no risk of bile peritonitis thanks to the mature fistula, additional EUS-HGS in segment 3 was performed to prevent cholangitis. After fistula maturation, the fistula was dilated using a balloon catheter, and a digital cholangioscope (Spy-Glass DS; Boston Scientific Japan, Tokyo, Japan) was inserted (► Fig. 2, ► Video 1). Under direct visualization, the migrated stent was readily grasped using a dedicated mini snare (SpySnare, Boston Scientific) and successfully retrieved. Finally, stones were extracted using electro-

hydraulic lithotripsy under direct cholangioscopic visualization [4]. No procedure-related adverse event occurred. Although stent dislocation can be a serious complication during interventional EUS and may need a surgical intervention, cholangioscopy-guided removal of a migrated stent through another route can be a nonsurgical salvage option, as we previously reported in EUS-guided pancreatic duct drainage [5].

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**Video 1** Retrieval of a migrated stent through a second hepaticogastrostomy fistula utilizing digital cholangioscopy.

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## Competing interests

The authors declare that they have no conflict of interest.

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