

## Advanced technique for biliary stricture diagnosis using endoscopic ultrasound (EUS)-guided hepaticogastrostomy



**► Fig. 1** Radiographic images showing: **a** endoscopic ultrasound (EUS)-guided hepaticogastrostomy being performed and a fully covered metal stent being placed; **b** brush cytology being performed through the hepaticogastrostomy route in an attempt to identify the cause of the stricture; **c** the intraductal cholangioscope being inserted through the hepaticogastrostomy route.

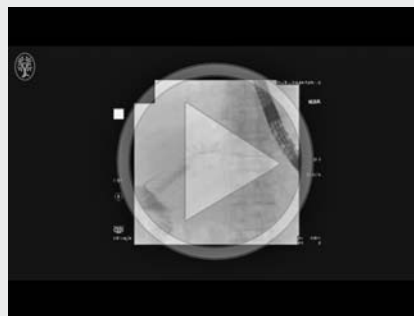
Postoperative benign biliary strictures are major adverse events following biliary surgery. Endoscopic retrograde cholangiography (ERC) is the standard treatment, but it is sometimes challenging in patients with surgically altered anatomy despite the development of balloon enteroscopy [1]. Recently, endoscopic ultrasound (EUS)-guided hepaticogastrostomy (EUS-HGS) has been reported as an effective salvage technique [2,3]. We report a case in which, after formation of an EUS-HGS fistula, re-intervention and diagnosis of the cause of a stricture were easily performed using intraductal cholangioscopy (IDC; SpyGlass DS system; Boston Scientific Corp., Natick, Massachusetts, USA) through the hepaticogastrostomy route.

A 67-year-old man who previously underwent right hepatectomy for hilar cholangiocarcinoma developed repeated episodes of cholangitis because of an anastomotic biliary stricture. Because ERC using a double-balloon enteroscope failed, EUS-HGS was performed and a fully covered metal stent was placed (► Fig. 1 a). After the fistula had matured,

brush cytology was attempted to identify the cause of the stricture. The metal stent was removed, leaving the guidewire, and the brush was inserted (► Fig. 1 b; ► Video 1). A double-pigtail stent was then placed from the anastomotic stricture to the fistula. The brush cytology

showed an atypical cell that could not be distinguished as benign or malignant. Brush cytology was then performed repeatedly; however, a diagnosis could still not be made. Therefore, an intraductal cholangioscope was inserted through the hepaticogastrostomy to obtain

### ► VIDEO 1



► Video 1: Brush cytology is performed through the hepaticogastrostomy route. The intraductal cholangioscope is then inserted through the hepaticogastrostomy to obtain direct visualization and to perform a biopsy using forceps. The intraductal cholangioscopy image shows a benign stricture and a biopsy is successfully taken.

direct visualization and perform a biopsy using forceps under direct visualization (► **Fig. 1 c**). The IDC image showed a benign stricture and the result of the biopsy showed no evidence of malignancy (► **Video 1**).

In the present case, EUS-HGS was performed successfully. The procedure time was short and re-intervention was performed easily and safely using the hepaticogastrostomy route. Because balloon enteroscopy is sometimes challenging, the present approach could become one of the choices for patients with surgically altered anatomy who are in need of re-intervention.

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### Competing interests

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None

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