

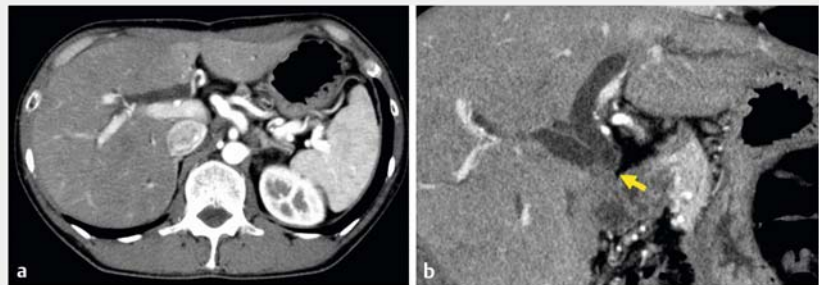
## Endoscopic ultrasound-guided choledochojejunostomy using a forward-viewing echoendoscopic saddle-cross technique



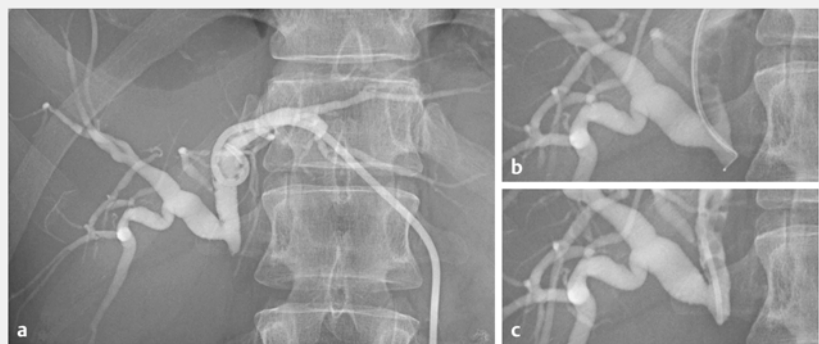
We reported good results for endoscopic treatment of benign hepaticojejunostomy anastomotic stricture (HJAS) using two fully covered self-expandable metallic stents (FCSEMSs) with the saddle-cross technique [1]. A completely occluded HJAS requires drainage by percutaneous transhepatic biliary drainage (PTBD) or endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) [2]; PTBD and EUS-HGS cannot be stent-free, which may decrease patients' activities of daily living. We present a modified saddle-cross technique for a completely occluded HJAS using a forward-viewing echoendoscope and two FCSEMSs.

A 30-year-old man underwent duodenal gastrointestinal stromal tumor surgery. Liver dysfunction occurred 1 year postoperatively; computed tomography showed bile duct dilatation (► Fig. 1). The transgastrointestinal approach and breakthrough in anastomosis under PTBD failed. The patient was referred to our hospital for internal fistulization (► Fig. 2).

Endoscopic ultrasound (EUS)-guided choledochojejunostomy using a forward-viewing endoscope (TGF-UC260; Olympus Medical Systems, Tokyo, Japan) with the saddle-cross technique was performed for internal fistulization (► Video 1). A forward-viewing endoscope was inserted up to the HJAS; anastomosis was confirmed using endoscopy and ultrasound (► Fig. 3). The bile duct was punctured through the anastomosis using a 19-gauge needle (EZ shot 3 plus; Olympus Medical Systems), and a 0.025-inch guidewire (M-through; Medico's Hirata, Osaka, Japan) was advanced into the bile duct. The fistula was dilated using an electrocautery dilator (Fine025; Medico's Hirata) and an 8-mm dilation balloon (REN; Kaneka, Tokyo, Japan). Two guidewires were placed in the right and left bile ducts and two FCSEMSs (BONASTENT M-Intraductal, 8 mm, 3 cm; Medico's Hirata) were placed (► Fig. 4).



► Fig. 1 Computed tomography scan showing dilation of the right and left bile ducts from the beginning of the hepaticojejunostomy anastomosis (arrow). **a** Axial image. **b** Coronal image.



► Fig. 2 Hepaticojejunostomy anastomotic stenosis approach from percutaneous transhepatic biliary drainage (PTBD). **a** Contrast from the PTBD shows complete occlusion of the hepaticojejunostomy anastomosis. **b** The guidewire could not pass through the hepaticojejunostomy anastomosis. **c** Contrast did not flow when the catheter was pressed against the hepaticojejunostomy anastomosis.

After PTBD removal, the two FCSEMSs were endoscopically removed 2 months postoperatively. Sufficient dilation of the fistula was observed (► Fig. 5). The patient experienced no restenosis 6 months postoperatively.

Although there are reports on EUS-guided choledochojejunostomy [3, 4], this is the first on treatment using a modified saddle-cross technique, which may be an option for primary endoscopic treatment of a completely occluded HJAS.

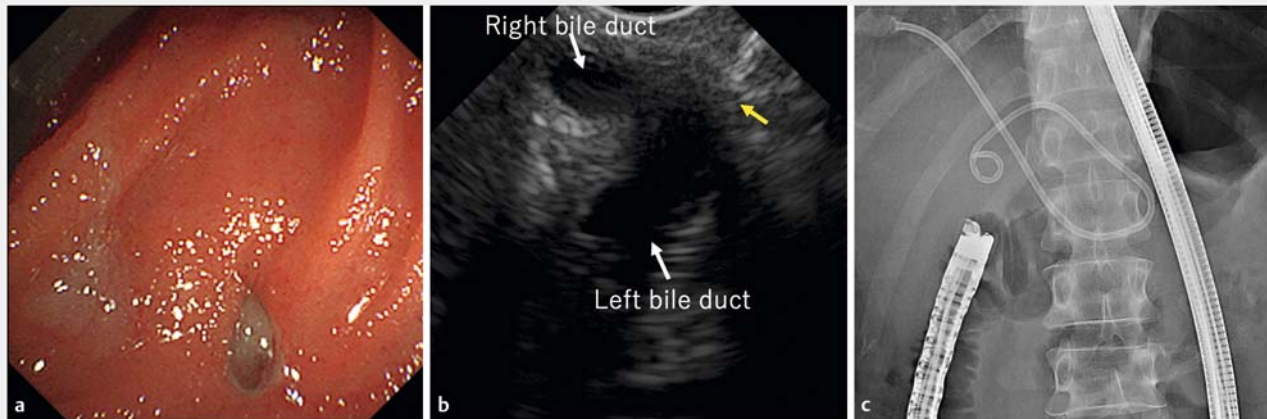
Endoscopy\_UCTN\_Code\_TTT\_1AS\_2AD

### Funding

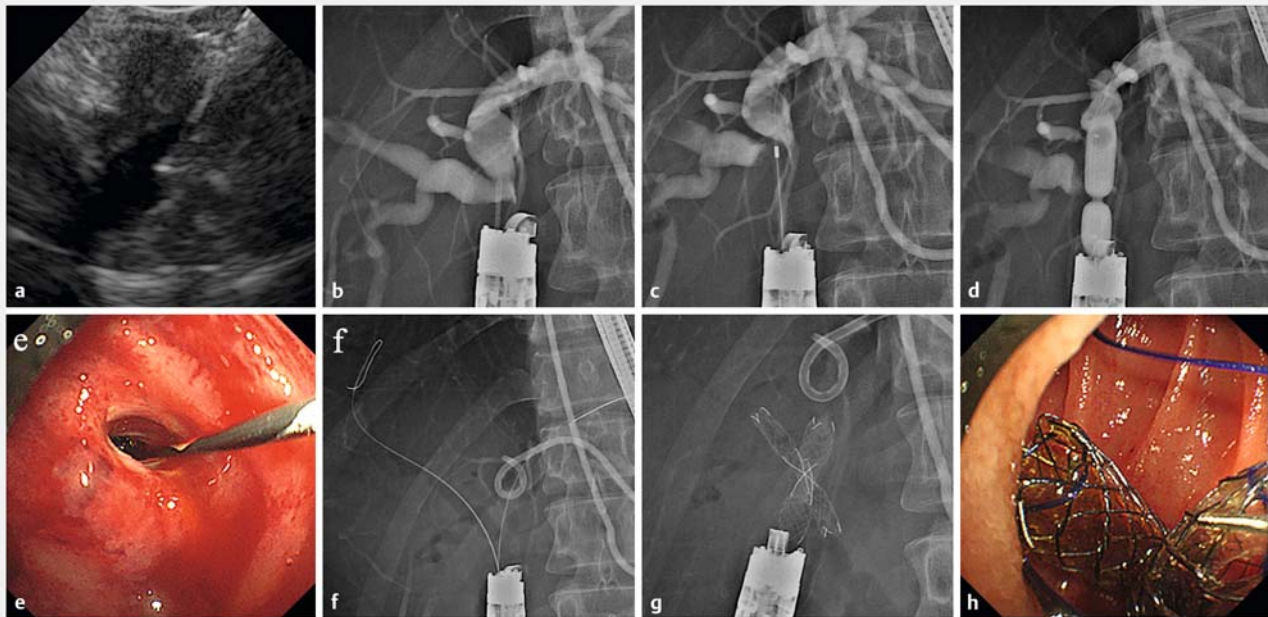
The National Cancer Center Research and Development Fund  
2022-A-16

### Competing interests

The authors declare that they have no conflict of interest.



► **Fig. 3** Trans-gastrointestinal endoscopic approach for hepaticojejunostomy anastomotic stenosis using a forward-viewing echoendoscope. **a** Endoscopic image of hepaticojejunostomy anastomotic stenosis. **b** Endoscopic ultrasound image of hepaticojejunostomy anastomotic stenosis (yellow arrow). **c** Radiograph of hepaticojejunostomy anastomotic stenosis.



► **Fig. 4** Endoscopic ultrasound (EUS)-guided choledochojejunostomy. **a** Puncture of the bile duct under EUS guidance using a 19-gauge needle. **b** Contrast enhancement confirms the bile duct. **c** Fistula dilation with an energized dilator. **d** Fistula dilation with a balloon dilator. **e** Endoscopic image of the fistula after dilation. **f** Two guidewires are placed in the right and left bile ducts. **g** Two fully covered self-expanding metal stents (FCSEMSs) are placed. **h** Endoscopic image after placement of the FCSEMSs.

### The authors

Yuki Kawasaki<sup>1,2</sup>, Susumu Hijioka<sup>1</sup>, Kotaro Takeshita<sup>1</sup>, Kiichi Tamada<sup>2</sup>, Takuji Okusaka<sup>1</sup>, Yutaka Saito<sup>3</sup>

- 1 Department of Hepatobiliary and Pancreatic Oncology, National Cancer Center Hospital, Tokyo, Japan
- 2 Department of Medicine, Division of Gastroenterology, Jichi Medical University, Tochigi, Japan
- 3 Department of Endoscopy Division, National Cancer Center Hospital, Tokyo, Japan

3 Department of Endoscopy Division, National Cancer Center Hospital, Tokyo, Japan

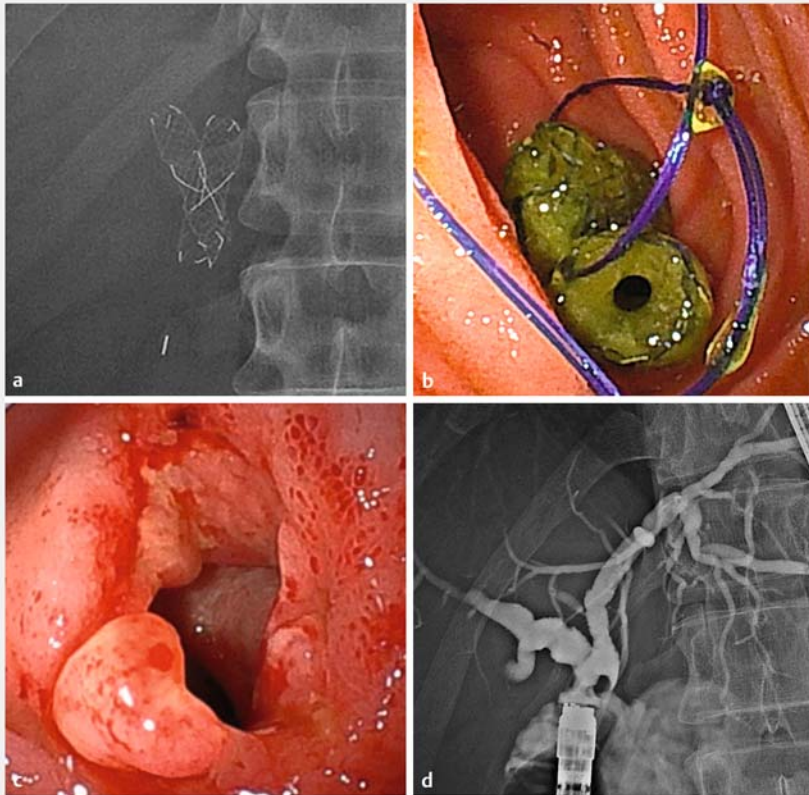
Fax: +81-52-763-5233  
shijioka@ncc.go.jp

### Corresponding author

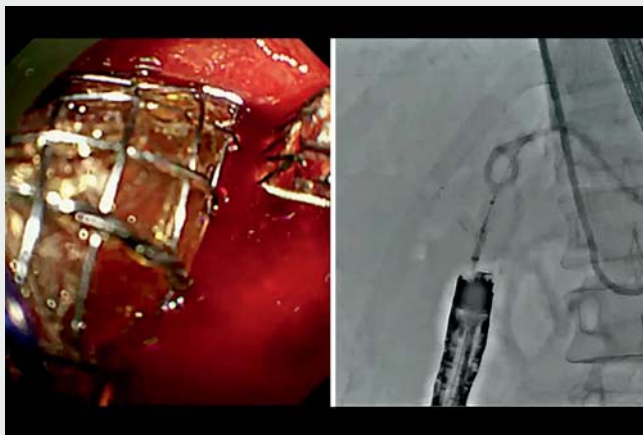
**Susumu Hijioka, MD**  
Department of Hepatobiliary and Pancreatic Oncology, National Cancer Center Hospital, 5-1-1 Tsukiji, Chuo-ku, Tokyo 104-0045, Japan

### References

- [1] Kawasaki Y, Hijioka S, Nagashio Y et al. A novel endoscopic technique using fully covered self-expandable metallic stents for benign strictures after hepaticojejunostomy: The saddle-cross technique (with



► **Fig. 5** Endoscopic removal of two FC-SEMSs 2 months after the procedure. **a** Radiograph of the two FCSEMSs. **b** Endoscopic image of the two FCSEMSs. **c** Endoscopic image after FCSEMS removal. **d** Radiograph shows good contrast spillage.



► **Video 1** Internal fistulization of completely occluded hepaticojejunostomy anastomotic stricture is difficult. We performed endoscopic ultrasound-guided choledochojejunostomy using a forward-viewing echoendoscope and two metallic stents with a modified saddle-cross technique.



video). *Surg Endosc* 2022. doi:10.1007/200464-022-09358-9

- [2] Tanisaka Y, Ryoza S, Mizuide M et al. Analysis of the factors involved in procedural failure: Endoscopic retrograde cholangiopancreatography using a short-type single-balloon enteroscope for patients with surgically altered gastrointestinal anatomy. *Dig Endosc* 2019; 31: 682–689
- [3] Itoi T, Ikeuchi N, Tonozuka R et al. EUS-guided choledochojejunostomy with a lumen-apposing metal stent in a post-Whipple patient. *Gastrointest Endosc* 2015; 81: 1259–1260
- [4] Kikuyama M, Aoyama H, Kyoden Y. Endoscopic ultrasonography-guided choledochojejunostomy: Novel method to treat a severely stenotic choledochojejunal anastomosis. *Dig Endosc* 2016; 28: 221

## Bibliography

*Endoscopy* 2023; 55: E233–E235

DOI 10.1055/a-1966-0478

ISSN 0013-726X

published online 18.11.2022

© 2022. The Author(s).

This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany



## ENDOSCOPY E-VIDEOS

<https://eref.thieme.de/e-videos>



*Endoscopy E-Videos* is an open access online section, reporting on interesting cases and new techniques in gastroenterological endoscopy. All papers include a high quality video and all contributions are freely accessible online. Processing charges apply (currently EUR 375), discounts and waivers acc. to HINARI are available.

This section has its own submission website at

<https://mc.manuscriptcentral.com/e-videos>