Cholangioscopy and double-balloon enteroscopy mediated “sandwich puncture” of a completely closed choledochojejunostomy

Toshio Fujisawa, MD, PhD, Hiroyuki Isayama, MD, PhD, Tomoyoshi Shibuya, MD, PhD, Ko Tomishima, MD, Shigeto Ishii, MD

BACKGROUND

Postoperative stricture after choledochojejunostomy is usually treated by (1) a percutaneous transhepatic approach, (2) balloon-assisted enteroscopy, or (3) interventional EUS. However, if the anastomosis is completely closed, it cannot be endoscopically expanded and must be surgically reopened. Although blind puncture and magnetic compression have been proposed as nonsurgical alternatives, they are not yet common procedures, and both carry risks such as perforation and major bleeding.

Here we report the case of a patient with a completely closed choledochojejunostomy that was successfully recanalized by sandwiching the anastomosis between percutaneous cholangioscopy and balloon-assisted enteroscopy devices.

CASE

A 37-year-old woman had undergone extrahepatic bile duct resection and biliary reconstruction for congenital biliary dilation. Four months later, she developed cholangitis as a result of stenosis of the choledochojejunostomy. Despite improvement in the cholangitis achieved with percutaneous transhepatic biliary drainage (PTBD), cholangiography via the PTBD catheter revealed no contrast material in the jejunum, and enteroscopy subsequently confirmed complete closure of the anastomosis (Fig. 1). Reoperation was advised, but the patient refused surgery and was referred to our hospital for endoscopic treatment (Video 1, available online at www.VideoGIE.org).

Initial approach

Percutaneous cholangioscopy (SPY-DS; Boston Scientific Corp, Boston, Mass, USA) confirmed that the choledochojejunostomy was completed occluded; our attempt to pass a guidewire (Visiglide2; Olympus Medical Corporation, Tokyo, Japan) through the anastomosis failed accordingly (Fig. 2).

Treatment

The anastomosis scar was observable from both the bile duct and the jejunum sides. Therefore, dilation was attempted by puncturing the duct in the location of the scar while it was sandwiched between percutaneous
cholangioscopy and balloon-assisted enteroscopy (EI-580BT; Fuji fi lm Corp, Tokyo, Japan), which is the latest version of the short-type double-balloon enteroscope that has a 1.55-m working length and a wider 3.2-mm working channel. The anastomosis scar was sufficiently thin for the lights of the 2 endoscopes to be visible on both sides of the bile duct and jejunum.

Fluoroscopy revealed a short distance between the 2 endoscopes (Fig. 3). The puncture point was revealed by the lights of the endoscopes and was marked (a slight indentation) using the tail-tip of the guidewire from the bile duct side (Fig. 4). After confirmation that the guidewire was visible from the jejunal side, the tail-tip of the guidewire was used to puncture the mucosa in the direction of the jejunum (Fig. 5).

A cautery dilator (fine025; Medico’s Hirata Inc, Osaka, Japan) was then advanced from the jejunum into the bile duct to cover the guidewire, which protruded into the jejunum (Fig. 6). The dilator was easily passed through the anastomosis scar without energization. After a second guidewire was placed from the jejunal side into the bile duct, the fistula was dilated to 4 mm with a balloon dilator (REN; Kaneka Corp, Tokyo, Japan) (Fig. 7).

Finally, a 10- to 40-mm fully covered self-expandable metal stent (FCSEMS) (BONASTENT M-intraductal; Standard Sci Tech, Seoul, South Korea) was placed in the fistula.
through the balloon-assisted enteroscope (Fig. 8). Fluoroscopy showed successful opening of the FCSEMS within the newly developed fistula (Fig. 9). The PTBD catheter (7F balloon; Create Medic Co Ltd, Tokyo, Japan) was kept in place in case the FCSEMS did not function.

**POSTOPERATIVE COURSE**

Because neither jaundice nor cholangitis developed, the PTBD catheter was removed 1 month after treatment; the FCSEMS was removed via enteroscopy 6 months after treatment. One year after removal of the FCSEMS, no adverse events have occurred.

**CONCLUSIONS**

For the treatment of postoperative anastomotic closure, the sandwich puncture, in which the anastomosis scar is viewed from the bile duct and jejunum sides using a cholangioscope and an enteroscope and is then punctured, may be a safe method that avoids reoperation. One of several advantages is that sandwich puncture can be performed while the condition and thickness of the anastomosis are being determined.

**DISCLOSURE**

*Dr Fujisawa receives lecture fees from Boston Scientific Corporation. Dr Isayama receives research grants from Boston Scientific Corporation and Fujifilm Corporation. All other authors disclosed no financial relationships.*

**REFERENCES**

1. Mukai S, Itoi T, Sofuni A, et al. EUS-guided antegrade intervention for benign biliary diseases in patients with surgically altered anatomy (with videos). Gastrointest Endosc 2019;89:399-407.
2. Servin-Abad L, Furuya C, Buch MA, et al. Endoscopic recanalization technique for complete ligation of bile duct after cholecystectomy. Gastrointest Endosc 2014;79:1002.
3. Jang SI, Cho JH, Lee DK. Magnetic compression anastomosis for the treatment of post-transplant biliary stricture. Clin Endosc 2020;53: 266-75.

Department of Gastroenterology, Graduate School of Medicine, Juntendo University, Tokyo, Japan.

Copyright © 2021 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

https://doi.org/10.1016/j.vgie.2021.03.010

---

**VideoGIE Quiz**

Think you can outsmart VideoGIE? Try your luck with our new Quiz series. Using cases published in VideoGIE, we post questions designed to improve the education of our fellows. Go to http://www.videogie.org to submit your answer, and keep checking back for more quizzes!