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Case Report

Percutaneous Transcystic Duct Metallic Stenting is a Useful Therapeutic Option for Common Bile Duct Obstruction : What Surgeons Should Know

Hironari KAWAI[1], Takeyuki MISAWA[1,2], Kazuto SASAYA[1], and Yoshishige AOYAMA[1]

[1]*Department of Surgery, Aoyama Hospital*
[2]*Department of Surgery, The Jikei University Kashiwa Hospital*

ABSTRACT

Background : Percutaneous transhepatic gallbladder drainage (PTGBD) is widely accepted when the obstruction is below the cystic bifurcation. However, unlike endoscopic retrograde biliary drainage (ERBD) or percutaneous transhepatic cholangial drainage (PTCD), PTGBD is not applicable for the further treatment of common bile duct (CBD) obstruction. Herein, we report a case in which the CBD obstruction was successfully treated with a metallic stent placed through the PTGBD route.

Case : An 82-year-old man with jaundice was found with computed tomography to have a pancreatic head tumor and CBD obstruction. The ERBD had failed owing to severe CBD obstruction, and PTCD had failed owing to ultrasound visualization failure. To relieve the jaundice, temporal PTGBD was performed. One week later, a metallic stent was successfully placed in the CBD obstruction through the PTGBD route. The serum bilirubin level decreased from 18.3 to 0.9 mg/dl in 4 months, and this decrease helped improve the patient's quality of life.

Conclusion : In selected cases, percutaneous transcystic duct biliary stenting can be a palliative treatment for CBD obstruction. (Jikeikai Med J 2018 ; 65 : 7-11)

Key words : metallic stenting, common bile duct obstruction, transcystic duct, biliary stenting

BACKGROUND

Most malignant tumors obstructing the bile duct have a poor prognosis. The obstruction can lead to jaundice, accompanying pruritus, and cholangitis. Therefore, prompt biliary drainage should be considered. For biliary drainage, the standard method is endoscopic retrograde biliary drainage (ERBD)[1,2]. However, ERBD might fail or is impossible if the obstruction is associated with severe biliary stricture, duodenal stenosis, or altered anatomy after surgery. In most such cases, a secondary tool is percutaneous transhepatic cholangial drainage (PTCD), which can also fail in cases with inadequate intrahepatic bile duct dilation or poor visualization with abdominal ultrasonography due to individual figures or colonic interposition between the liver and the diaphragm (Chilaiditi's sign)[3]. In addition, PTCD is difficult to perform if patients have severe coagulopathy or are receiving antiplatelet or anticoagulation drugs because major bleeding might occur after erroneous piercing of an intrahepatic artery or portal vein. Therefore, surgical biliary drainage should be considered only when patients undergo exploratory laparotomy and when tumors are regarded as unresectable[4]. If the ERBD or PTCD is technically difficult and the patient cannot undergo surgery, the available meth-

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河合　裕成，三澤　健之，笹屋　一人，青山　賀茂
Mailing address : Hironari KAWAI, Aoyama Hospital, 4-21-8, Ichiba, Funabashi-shi, Chiba 273-0001, Japan.
E-mail : h-kawai@jikei.ac.jp

ods for bile duct obstruction are limited. Herein we report successful percutaneous transcystic duct metallic stenting as a palliative treatment of malignant bile duct obstruction after the failure of ERBD and PTCD.

CASE PRESENTATION

An 82-year-old man presented with jaundice and anorexia. Hematologic examination revealed mild anemia (hemoglobin, 10.1 g/dl). Serum levels were elevated as follows : alanine aminotransferase, 58 IU/l ; alkaline phosphatase, 1,463 IU/l ; gamma glutamyl transpeptidase, 170 IU/l ; and direct bilirubin, 13.6 mg/dl. The values of HbA1c, CA19-9, and carcinoembryonic antigen were within normal limits. Contrast-enhanced computed tomographic examination of the abdomen revealed a nonuniform contrast-effect tumor with a diameter of 13 mm in the head of the pancreas which caused dilation of both the common bile duct (CBD) and the main pancreatic duct (Fig. 1). The maximum diameter of the CBD was 20 mm, and that of the main pancreatic duct was 9 mm. Because metastatic lesions were not observed in other organs or in lymph nodes, pancreaticoduodenectomy was considered. However, the patient was 82 years old and preferred the symptoms to be relieved without surgery.

To relieve the symptoms, we first performed ERBD, but the cannulation was not completed owing to severe bile duct stricture. We then performed PTCD as a secondary tool, but it also failed because of poor visualization with ultrasonography caused by colonic interposition between the liver and the diaphragm (Chilaiditi's sign) (Fig. 2). Because ERBD and PTCD were technically difficult, we performed temporary percutaneous transhepatic gallbladder drainage (PTGBD) with a 7F pigtail-type biliary drainage tube (Hanaco Medical Co., Ltd., Tokyo, Japan). Because the biliary drainage remained inadequate after PTGBD, we planned to insert a metallic stent into the CBD stricture through the cystic duct.

A week later after PTGBD, a 0.035-inch hard guidewire (Jagwire™ Super Stiff, Boston Scientific Japan, Tokyo, Japan) was advanced into the cystic duct and the CBD after injection of contrast medium into the gallbladder within the visualized cystic duct and CBD. The hard guidewire was then inserted into the duodenum through the bile duct stricture. Cholangiography revealed a 15-mm stricture of the bile duct. An uncovered self-expandable metal stent (Luminexx biliary stent, 8 mm in diameter and 60 mm in length ; Bard Peripheral Vascular, Inc., Tempe, AZ, USA) was placed in an appropriate positon over the stricture.

One week later after PTGBD, percutaneous transcystic duct metallic stenting was successfully performed without complications (Fig. 3b, 4). A new 7F straight drainage catheter was left in place proximal to the end of the metallic stent as a safety measure during the initial stent placement and was removed after resolution of cholestasis, and stent patency was confirmed 1 week after the procedure. The step-by-step approaches for transcystic duct metallic stenting are described in Figure 3. The bilirubin concentration decreased in 4 months from 18.3 to 0.9 mg/dl and

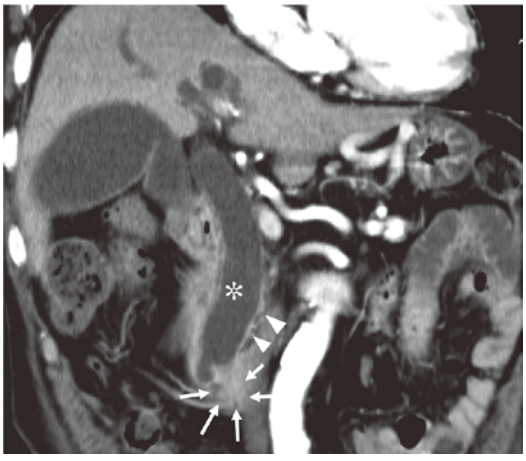

Fig. 1. Contrast-enhanced computed tomography of the abdomen revealed a nonuniform contrast effect tumor, with a diameter of 13 mm in the head of the pancreas (arrows), which caused dilation of both the common bile duct (asterisk) and the main pancreatic duct (arrowheads).

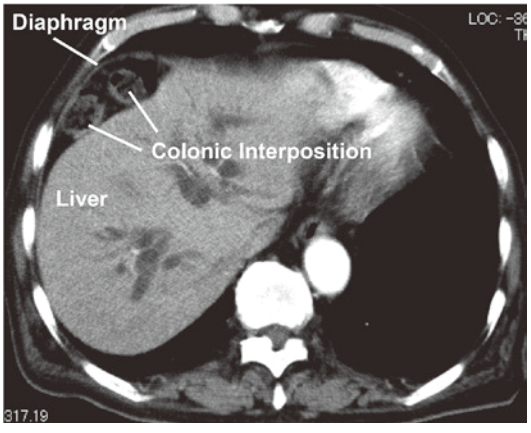

Fig. 2. Computed tomography revealed a colonic interposition between the diaphragm and the liver (Chilaiditi's sign).

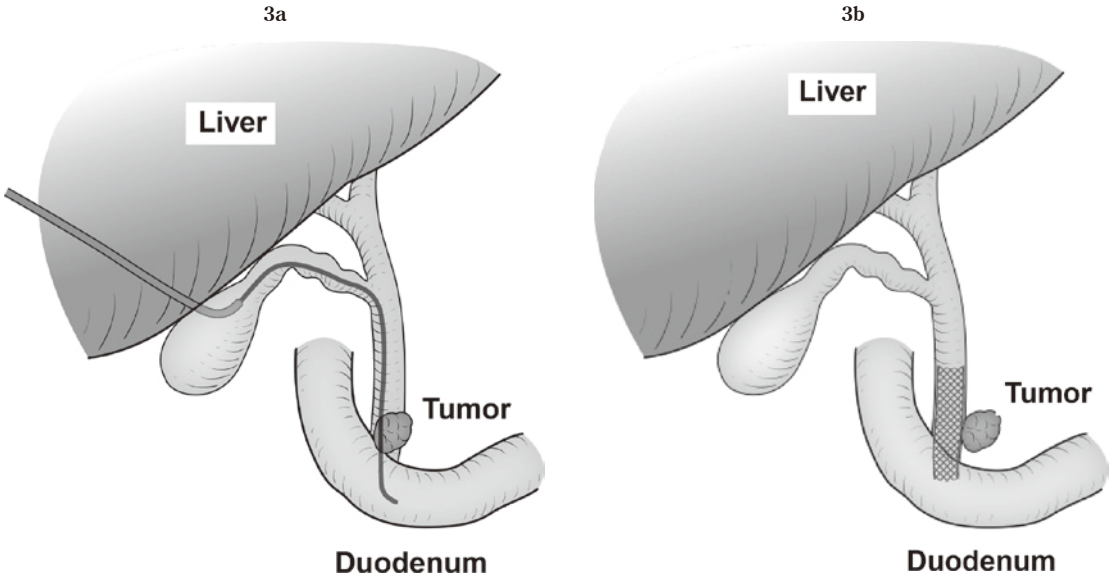

Fig. 3. Transcystic duct metallic stenting step-by-step approaches. a) After percutaneous transhepatic gallbladder drainage, a hard guidewire was inserted into the common bile duct through the cystic duct and was advanced into the duodenum over the stricture. b) A week after percutaneous transhepatic gallbladder drainage, a metallic stent was successfully placed in an appropriate position.

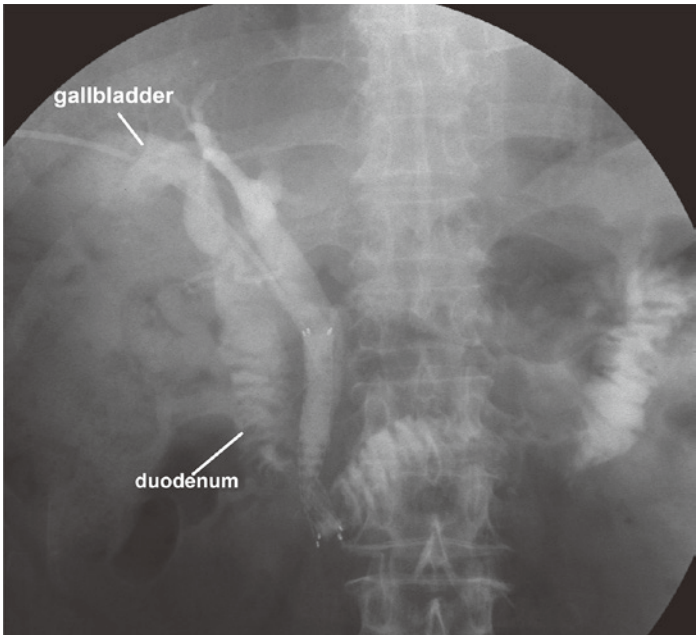

Fig. 4. Cholangiography after metallic stent placement. A metallic stent was placed in an appropriate position through the cystic duct. Contrast medium flowed into the duodenum.

helped improve the patient's quality of life.

Discussion

Image-guided percutaneous transcystic duct intervention for treatment of CBD stones was reported first in 1981[5]. Several decades ago, percutaneous transcystic duct intervention for treatment of malignant and benign CBD obstruction seemed to be frequently performed by interventional radiologists[6-9], but few reports have recently been

published. A reported 15-case series of transcystic duct metallic stent placement for malignant CBD obstruction[10] had a technical success rate of 100% (15 of 15 cases), a clinical success rate of 93% (14 of 15 cases), and a mean duration of stent patency of 10 months. The technical and clinical success rates were similar to or better than those of other methods of metallic stenting for PTCD or ERBD[4,11]. No complications have been reported to be caused by the catheterization of the cystic duct. Nevertheless, perforation of the cystic duct and hemobilia are possible adverse events, although these complications are usually self-limited and require no further treatment.

In a recent review article[12] for percutaneous biliary interventions through the gallbladder and the cystic duct, this technique is indicated for 1) existing cases of cholecystostomy, 2) failure or contraindication of PTCD or ERBD, and 3) acute cholecystitis due to cystic duct obstruction. This technique also has several limitations. The most important point is that the success of this procedure depends largely on the anatomy of the cystic duct. If the cystic duct is extremely tortuous, spiral, and narrow (less than 2 mm), inserting the wire through the cystic duct and into the CBD might be difficult. The anatomy of the cystic duct causes similar limitations for endoscopic transpapillary gallbladder drainage, which is an alternative gallbladder drainage method for acute cholecystitis[13-15], and cystic duct perforation related to endoscopic transpapillary gallbladder drainage has been reported[14]. However, even if the anatomy of the cystic duct is complex, this procedure can be performed once with careful attention of the cystic duct perforation or hemobilia. In the present case, the cystic duct was dilated and merged at the middle of the common bile duct ; therefore, the procedure was not difficult.

The appropriate time between PTGBD procedure and transcystic duct metallic stent placement is controversial. Transcystic duct metallic stenting has been reported to be performed 1 to 2 weeks after PTGBD to ensure that the tract has matured and to avoid bile leakage[10,12]. On the other hand, one-step insertion of a metallic stent through the PTBD route for obstructive jaundice is reportedly effective[16]. In regard to the appropriate time of drainage catheter removal, the catheter was removed 2 to 7 days after procedures following resolution of cholestasis, and stent patency has been confirmed in some reports[10,16]. In the present case, we performed transcystic duct metallic stenting 1 week later after PTGBD to avoid bile leakage and removed the drainage catheter 1 week after the procedure, when resolution of cholestasis and stent patency had been confirmed.

The endoscopic ultrasonography (EUS)-guided transluminal approach has recently been used by experienced endoscopists in tertiary care centers[17]. This approach allows internal transgastric and transjejunal drainage of the biliary tree in patients for whom conventional drainage is impossible, such as those with severe biliary stricture, duodenal stenosis, or altered anatomy after surgery. However, the EUS-guided transluminal approach increases the risk of bile leakage into the peritoneum or pneumoperitoneum and requires the endoscopist to have considerable expertise in EUS-guided interventions ; therefore, this approach is often unavailable at rural community hospitals. Unlike surgeons at tertiary care centers, surgeons at rural community hospitals must often perform PTCD and, occasionally, ERBD by themselves if an endoscopist is not present. Therefore, if ERBD and PTCD have failed, surgeons should consider percutaneous transcystic duct metallic stenting as an alternative for treating CBD obstruction.

Conclusion

The percutaneous transcystic duct metallic stenting is technically feasible for selected cases, and surgeons should consider this procedure as a palliative treatment for malignant biliary obstruction.

Competing Interests

Authors have no conflict of interest.

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