



Biliary reintervention with endoscopic inversion technique in the duodenum with the use of short-type double-balloon endoscope in a patient with an indwelling duodenal stent

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Endoscopic biliary and duodenal metallic stent placement is a current mainstay of treatment for combined malignant biliary obstruction (MBO) and gastric outlet

obstruction (GOO).^{1,2} In patients with an indwelling duodenal stent (DuS), endoscopic biliary reintervention is technically challenging, and percutaneous transhepatic

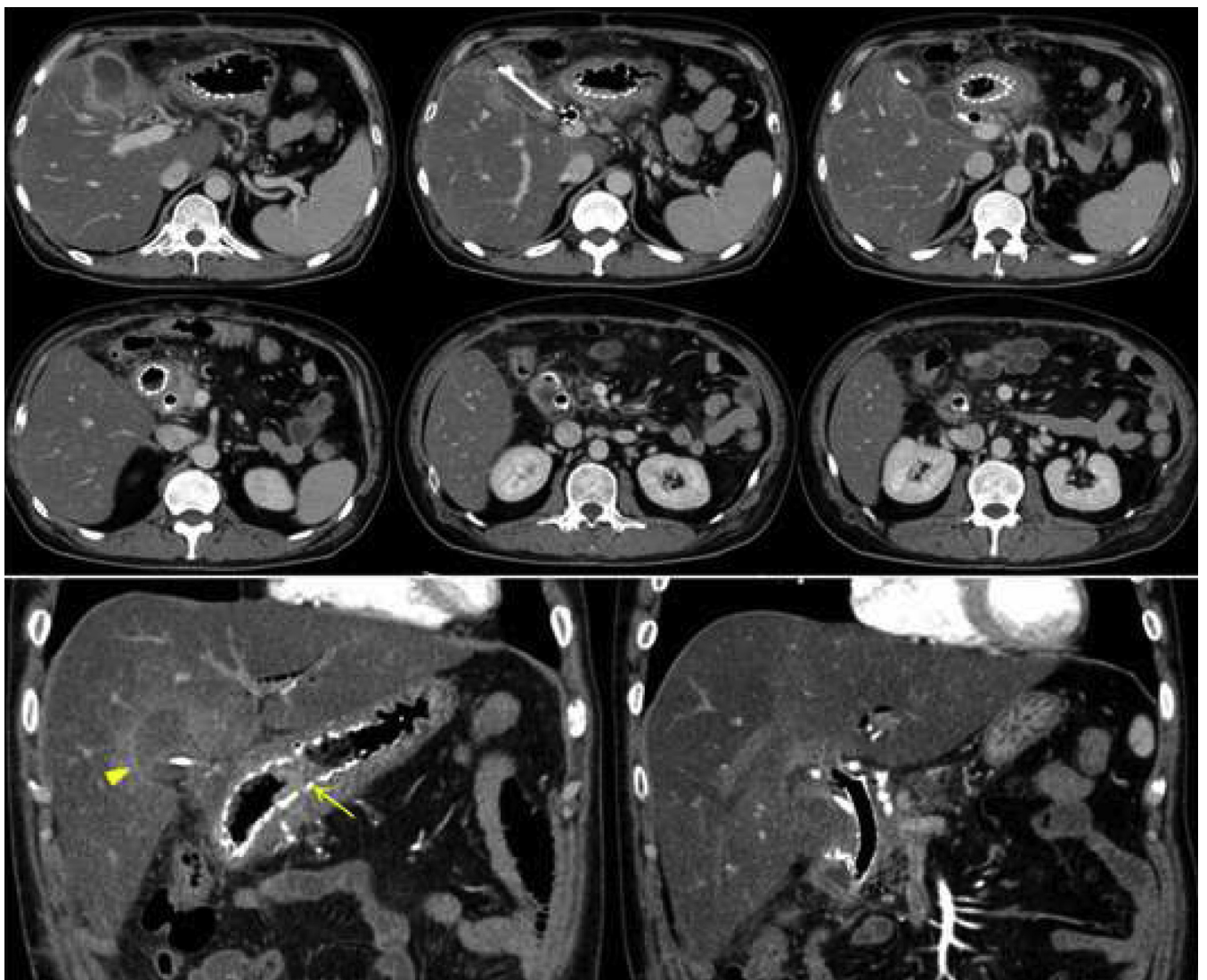


Figure 1. CT scan showing cholecystitis (*arrowhead*), suggesting gallbladder stent dysfunction. A biliary metallic stent and a gallbladder plastic stent had been transpapillary placed in a side-by-side fashion. The distal end of the duodenal stent was located proximal to the papilla, and tissue hyperplasia through the mesh was suspected at the midportion of the stent (*arrow*).

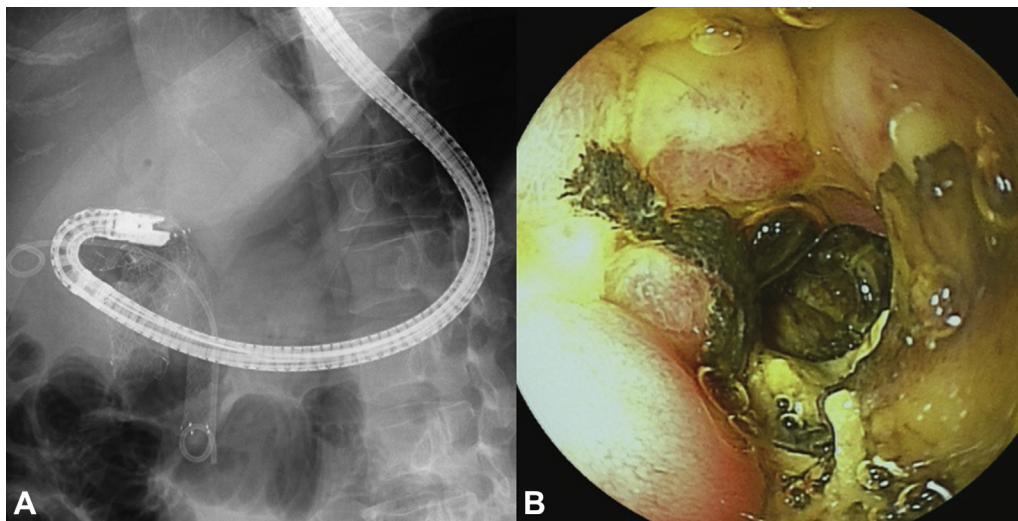


Figure 2. A side-viewing duodenoscope could not pass through the duodenal stent because of tissue hyperplasia. **A**, Fluoroscopic image. **B**, Endoscopic image of tissue hyperplasia.



Mechanical properties of the short-type double-balloon endoscope system		
	Endoscope (EI-580BT)	Overtube (TS-13101)
Working length	1550 mm	950 mm
Total length	1850 mm	1050 mm
Distal end diameter	9.4 mm	13.2 mm
Flexible portion diameter	9.3 mm	-
Working channel diameter	3.2 mm	-
Advanced force-transmission function	Yes	-
Adaptive bending system	Yes	-

Figure 3. Mechanical properties of the short-type double-balloon endoscope and its overtube.

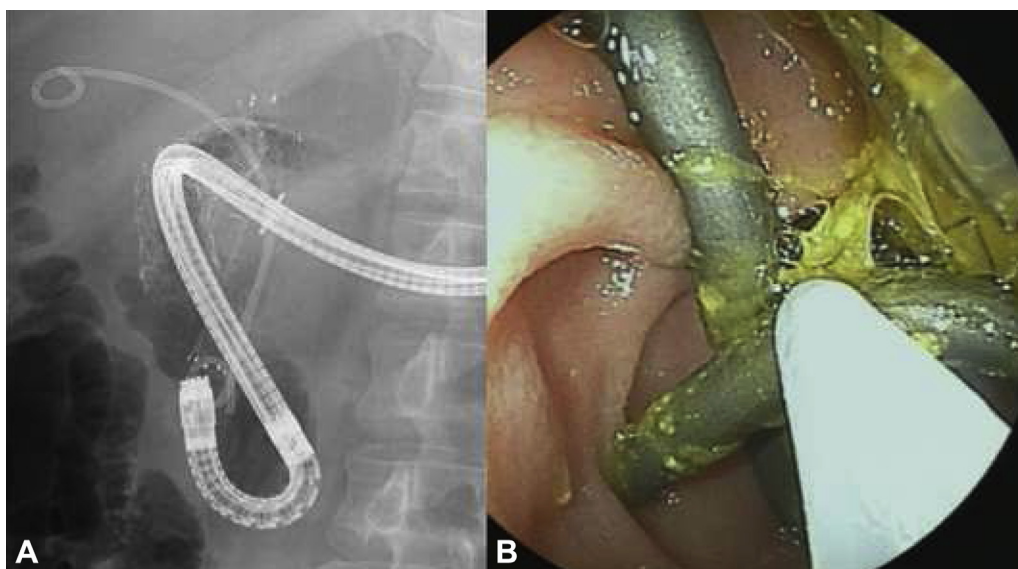


Figure 4. The double-balloon endoscope completely passed the duodenal stent. The gallbladder plastic stent was successfully removed through the working channel with a snare. **A**, Fluoroscopic image. **B**, Endoscopic image of the gallbladder plastic stent removal.

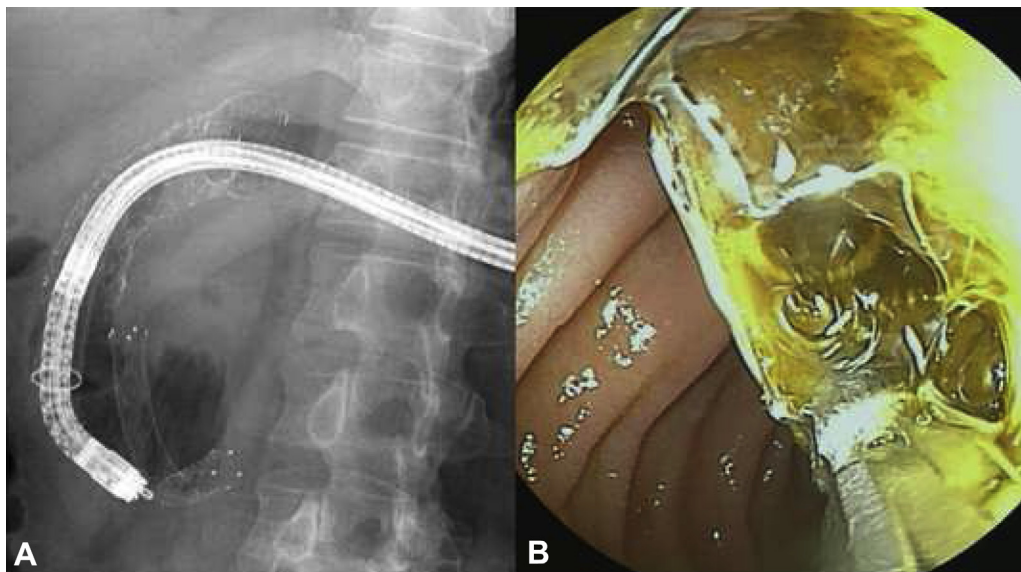


Figure 5. The biliary metallic stent was grasped by an alligator forceps and safely removed along with the endoscope through the overtube. **A**, Fluoroscopic image. **B**, Endoscopic image of the biliary metallic stent removal.

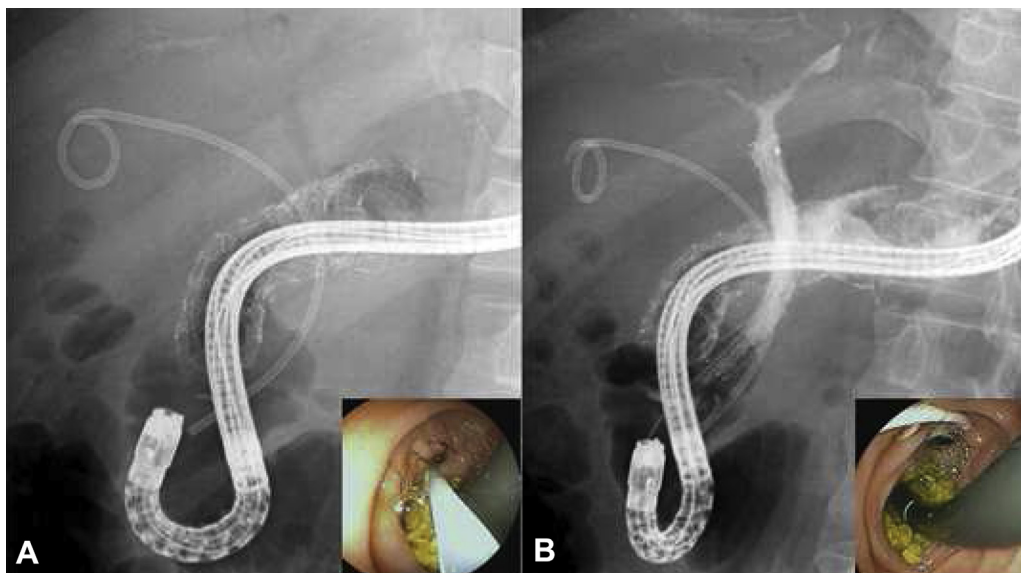


Figure 6. By the inversion technique of the double-balloon endoscope in the duodenum, biliary access was achieved, and a gallbladder plastic stent and a biliary metal stent were successfully placed. **A**, Fluoroscopic and endoscopic images of the gallbladder plastic stent insertion. **B**, Fluoroscopic and endoscopic images of the biliary metallic stent insertion.

biliary drainage (PTBD) is frequently required as a salvage treatment.³⁻⁶ However, PTBD can be contraindicated in patients with massive ascites or severe coagulopathy, and is associated with deterioration of quality of life and with an increased risk of adverse events.⁷ Here, we report a case of successful endoscopic transpapillary biliary reintervention through an indwelling DuS by use of a double-balloon endoscopic (DBE) inversion technique.

A 51-year-old man was referred to us for management of MBO and GOO resulting from cancer of the pancreatic

head. A biliary covered metallic stent and gallbladder plastic stent had been placed for MBO and concomitant cholecystitis, followed by DuS (Niti-S ComVi stent; Taewoong, Gimpo, Korea) placement for GOO. Three months later, cholecystitis recurred because of dysfunction of the gallbladder plastic stent (Fig. 1). Because the patient refused percutaneous cholecystostomy, we decided to perform ERCP through the DuS and to exchange both biliary and gallbladder stents (Video 1, available online at www.VideoGIE.org). Because a duodenoscope (ED-580T;

Fujifilm, Tokyo, Japan) could not pass the DuS as a result of tissue hyperplasia (Fig. 2), we exchanged the duodenoscope for a short-type DBE (EI-580BT; Fujifilm). This system consists of a thin, flexible scope with a 3.2-mm working channel and equipped with an overtube and balloons, ensuring advanced scope insertability with stabilization and subsequent interventions with the use of standard ERCP devices (Fig. 3).⁸ A DBE completely passed through the DuS, and the gallbladder stent was successfully removed through the working channel (Fig. 4). Then, the biliary metallic stent was safely removed, along with the scope, through the overtube (Fig. 5). With the endoscopic inversion technique in the second portion of the duodenum (just distal to the DuS), we could easily achieve biliary access and the stent exchange. A pigtail plastic stent (7F × 15 cm; Hanaco Medical, Saitama, Japan) for the gallbladder and a biliary metallic stent (10 mm × 8 cm; Zilver, Cook, Tokyo, Japan) were positioned in a side-by-side fashion (Fig. 6).

Recently, a new short-type DBE (EI-580BT) was developed to facilitate pancreaticobiliary interventions in patients with surgically altered anatomy. This thin, flexible endoscope features an advanced forced-transmission insertion tube and adaptive bending, which allows easy passage of the endoscope through the narrow, angulated GI tract and the DuS. Furthermore, the small bending radius of the endoscope tip enables an approach to the papilla by making a retroflex position in the duodenum.⁹ Therefore, despite the disadvantage of its longer length and lack of an elevator system, this endoscope can be applicable to biliary interventions in patients with normal anatomy but with an indwelling DuS.

DISCLOSURE

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Abbreviations: DBE, double-balloon endoscopy; DuS, duodenal stent; GOO, gastric outlet obstruction; MBO, malignant biliary obstruction; PTBD, percutaneous transhepatic biliary drainage.

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