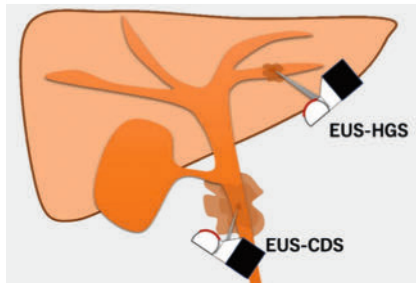
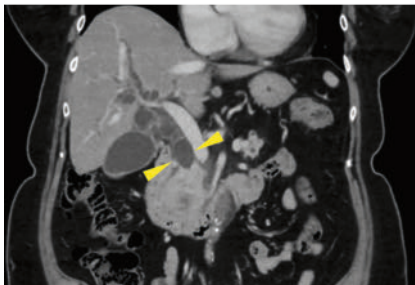


Balloon compression technique using an echoendoscopic balloon tip to prevent bile leakage in endoscopic ultrasound-guided choledochoduodenostomy

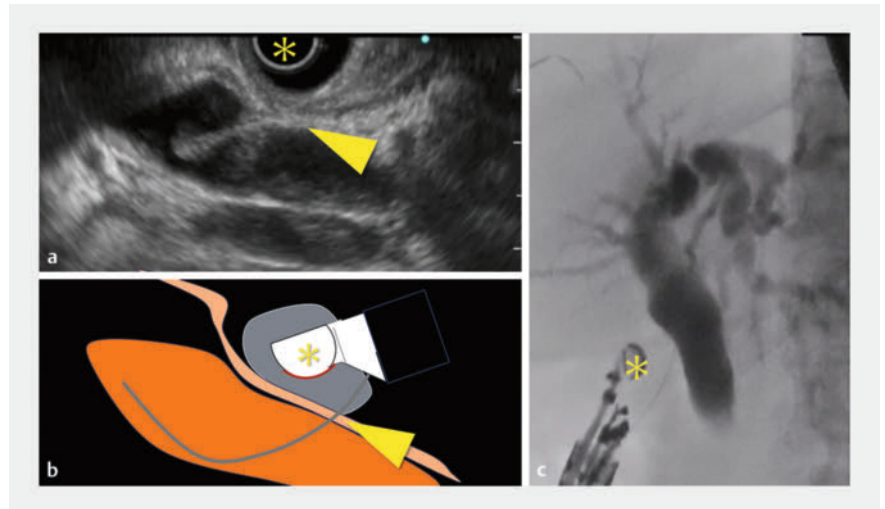


► **Fig. 1** The liver parenchyma surrounding the bile duct prevents bile leakage in endoscopic ultrasound guided-hepaticogastrostomy (EUS-HGS), whereas endoscopic ultrasound guided-choledochoduodenostomy (EUS-CDS) has a higher risk of bile leakage because of the absence of surrounding organ protection.



► **Fig. 2** Pre-procedural computed tomography scan demonstrating a dilated common bile duct (yellow arrowhead).

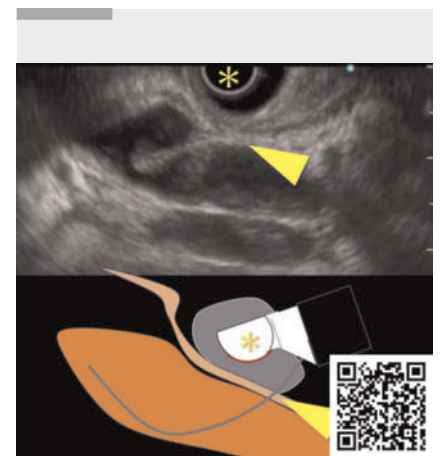
Endoscopic ultrasound-guided biliary drainage (EUS-BD) is an alternative treatment for patients with malignant biliary obstruction or those with failed endoscopic retrograde cholangiopancreatography (ERCP) [1–4]. Endoscopic ultrasound-guided choledochoduodenostomy (EUS-CDS), a specific type of EUS-BD, can cause complications, such as bile peritonitis [5]. Previous studies have reported bile leakage in 2.8% of cases and peritonitis in 1.4% of EUS-CDS procedures [2]. In EUS-guided hepaticogastrostomy, a longer length of the liver parenchyma is associated with a reduced



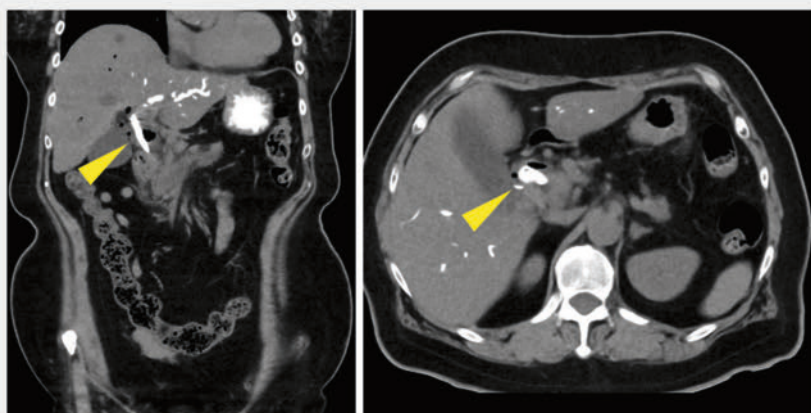
► **Fig. 3** a Endoscopic image demonstrating the inflated balloon tip (yellow asterisk) compressing the fistula site (yellow arrowhead) following dilation. b Schematic representation of the balloon compression technique demonstrating the spatial relationship between the echoendoscope, balloon tip, and fistula. c Cholangiography demonstrating bile duct compression using a balloon tip.

risk of bile leakage [3]. In contrast, EUS-CDS lacks surrounding organ support, potentially increasing the risk of peritonitis if bile leakage occurs (► **Fig. 1**). We developed a novel technique using balloon compression at the fistula site with an echoendoscope balloon tip to prevent bile leakage-induced peritonitis (► **Video 1**).

A 70-year-old woman presented with pancreatic cancer-caused obstructive jaundice. Pre-procedural computed tomography (CT) revealed a dilated common bile duct (► **Fig. 2**). ERCP was unsuccessful because of tumor invasion of the papilla. Therefore, EUS-CDS was performed as an alternative intervention. Using an echoendoscope (GF-UCT260; Olympus Medical Systems), the dilated common bile duct was visualized from the duodenal bulb. An EZ Shot 3 Plus 19G needle (Olympus Medical Systems) was used for puncture, and a 0.025-inch guidewire was successfully inserted. The



► **Video 1** During endoscopic ultrasound-guided choledochoduodenostomy, balloon compression at the fistula site using the echoendoscope tip before stent placement may prevent bile leakage-associated complications.



► **Fig. 4** Post-procedure computed tomography scan demonstrating a properly positioned self-expandable metallic stent (yellow arrowhead) without any bile leakage.

puncture site was subsequently dilated to 4 mm using REN (Kaneka Medix Corporation).

Following fistula dilation, to prevent potential bile leakage, the balloon at the tip of the echoendoscope was inflated to compress the puncture site before metal stent insertion (► **Fig. 3**). Subsequently, a self-expandable metallic stent (Niti-S EUS-BD system; Century Medical) was placed. Post-procedural CT confirmed the absence of bile leakage (► **Fig. 4**). Fistula site compression using the echoendoscope balloon tip after fistula dilation and before metal stent placement may reduce bile leakage complications in EUS-CDS.

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Conflict of Interest

The authors declare that they have no conflict of interest.

The authors

Takashi Koriyama^{1,2}, Shunsuke Omoto³, Mamoru Takenaka³, Michihito Kono^{1,2}, Akito Furuta^{1,2}, Taro Inoue^{1,2}, Wataru Ono^{1,5}

¹ Departments of Gastroenterology, Kishiwada Tokushukai Hospital, Kishiwada, Japan

- ² Departments of Gastroenterology, Kobe Tokushukai Hospital, Kobe, Japan, Kishiwada, Japan
- ³ Department of Gastroenterology and Hepatology, Kindai University Faculty of Medicine, Osaka-Sayama, Japan

Corresponding author

Shunsuke Omoto, MD, PhD

Department of Gastroenterology and Hepatology, Kindai University Faculty of Medicine, 377-2 Ohno-Higashi, Osaka-Sayama, 589-8511, Japan
shunsuke.oomoto@gmail.com

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