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Forward-viewing echoendoscope plus gel immersion technique in a patient with Billroth II reconstruction

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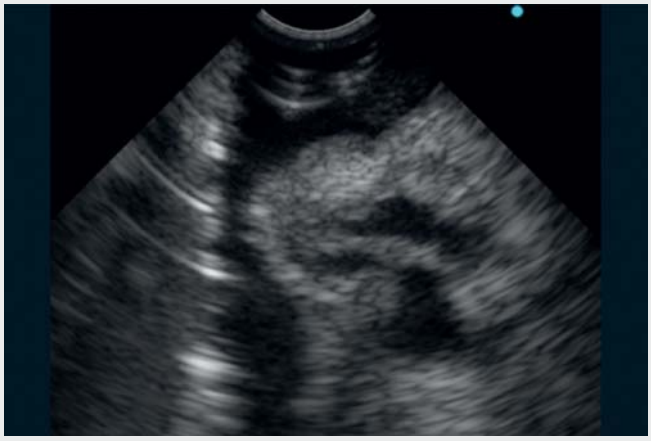
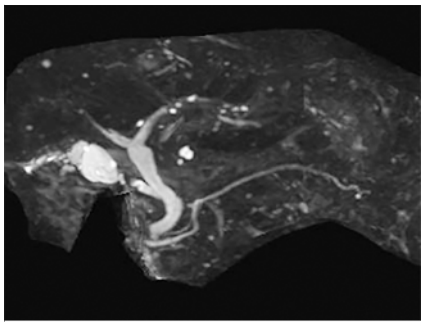


Video 1 The intrapancreatic pancreaticobiliary ducts and papilla were successfully observed in a patient with Billroth II reconstruction using forward-view echoendoscopy and the gel immersion technique.

Endoscopic ultrasound (EUS) in patients with surgically altered anatomy is often difficult, and forward-view echoendoscopy (FV-EUS) has proven to be useful in such cases [1]. Recently, the gel immersion technique has been used for various endoscopic diagnostic and therapeutic procedures [2–4]. In the case reported here, the bile ducts and papilla were successfully observed in a patient with a Billroth II reconstruction using FV-EUS and the gel immersion technique (▶ **Video 1**).

An 82-year-old man who had undergone distal gastrectomy with Billroth II reconstruction for a gastric ulcer was referred to our center with elevated hepatobiliary enzymes and suspected cholangitis. Blood tests had not revealed an identifiable cause of hepatitis, while abdominal ultrasonography, computed tomography, and magnetic resonance cholangiopancreatography showed no bile duct dilatation and no obvious origin of the obstruction (▶ **Fig. 1**).

EUS was performed using a linear echoendoscope; however, scope insertion into the afferent limb was difficult and the bile ducts could not be visualized in the stomach region. By switching to FV-EUS (TGF-UC260J; Olympus Medical Systems Corp., Tokyo, Japan), we safely guided the scope to the afferent limb with visualization of the anastomosis and successfully reached the ampulla of Vater. FV-EUS revealed mild dilatation of the common bile duct, with no obvious stones. The peripapillary delineation was unclear, making it difficult to detect the presence of small stones or tumors (▶ **Fig. 2**). For gel immersion, the duodenum was filled with gel (VISCOCLEAR; Otsuka Pharmaceutical Factory, Tokushima, Japan) via the scope working channel. The intrapancreatic pancreaticobiliary ducts and papilla could then be delineated clearly (▶ **Fig. 3**). Therefore, with the absence of stones/tumors confirmed, endoscopic retrograde cholangiopancreatography was deemed unnecessary. Thereafter, the patient's hepatobiliary enzyme levels slowly decreased. In the afferent limb, the gel tended to pool at the blind end and could be clearly observed.



▶ **Fig. 1** Magnetic resonance cholangiopancreatography demonstrated no apparent obstruction of the bile ducts.

▶ **Fig. 2** View during forward-view echoendoscopy showing that, although visualization of the intrapancreatic bile ducts and papilla was possible, detailed evaluation was difficult.

FV-EUS plus gel immersion was considered to be the best combination for pancreaticobiliary examination in such patients with surgically altered anatomy.

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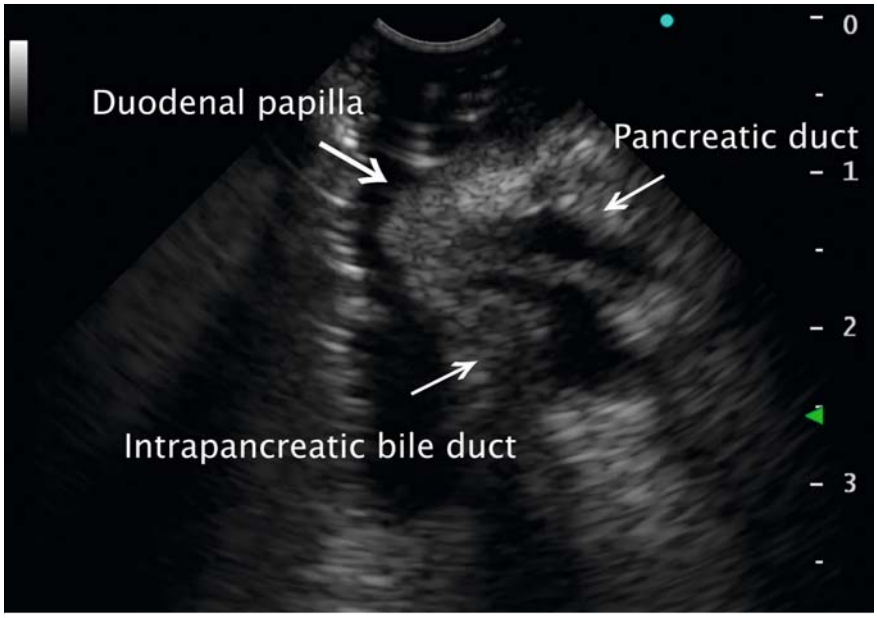
Competing interests

A. Katanuma has received speaker's fees from Olympus Co., Tokyo, Japan. The remaining authors declare that they have no conflict of interest.



▶ **Fig. 3** Gel immersion endoscopic ultrasound view clearly showing the papilla and intrapancreatic bile duct.

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