

DEN Video Article

Endoscopic ultrasound examination of the intrapancreatic pancreatobiliary ducts using the gel immersion method in patients with periampullary duodenal diverticula

Haruka Toyonaga,  Toshifumi Kin  and Akio Katanuma 

Center for Gastroenterology, Teine Keijinkai Hospital, Hokkaido, Japan

BRIEF EXPLANATION

THE GEL IMMERSION (GI) method was introduced for endoscopic hemostasis;¹ viscous gel secures the

endoscopic visual field without mixing with blood. GI endoscopic ultrasound (GI-EUS) has also been reported to maintain better acoustic coupling by filling the esophagus with viscous gel.^{2,3} However, there are few reports on its

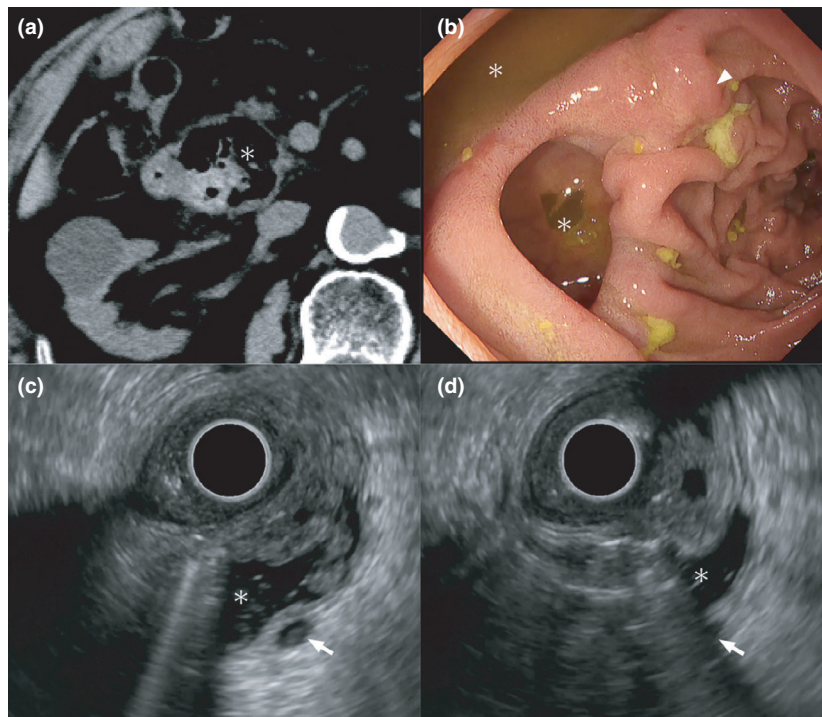


Figure 1 (a) Computed tomography image of a patient who underwent pancreatobiliary endoscopic ultrasound (EUS) reveals a large periampullary diverticulum (asterisk). (b) Endoscopic image of the periampullary diverticula and the papilla (arrowhead). (c, d) EUS image shows that air trapped in periampullary diverticula disturb acoustic coupling, and delineating the biliary duct and pancreatic duct (arrow) was difficult.

Corresponding: Haruka Toyonaga, Center for Gastroenterology, Teine Keijinkai Hospital, 1-40, 12-chome, 1-jou, Maeda, Teine-ku, Sapporo, Hokkaido 006-8555, Japan. Email: toyonaga.pc@gmail.com

Received 31 May 2021; accepted 20 June 2021.

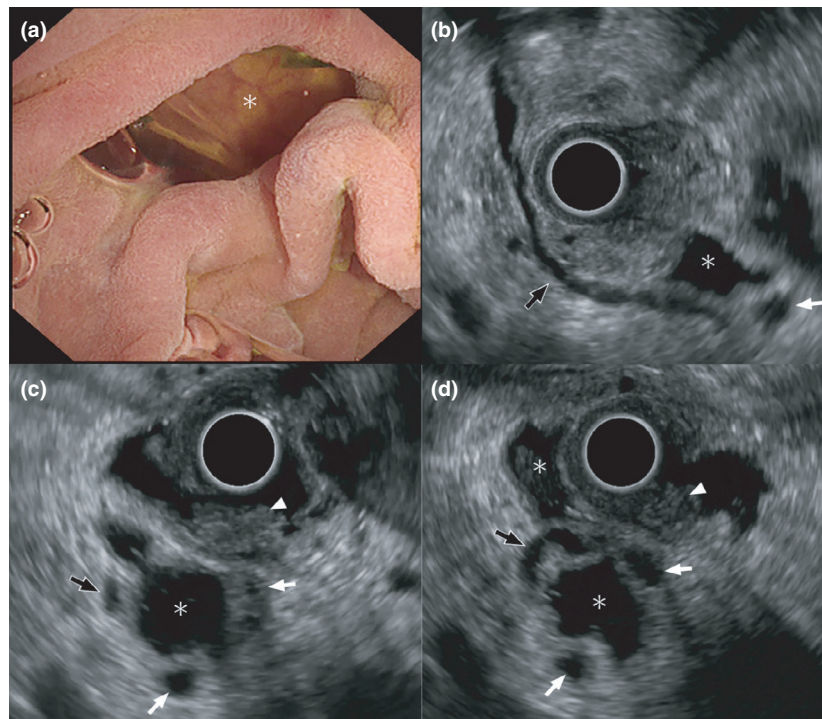


Figure 2 (a) Endoscopic image of the duodenum and perampullary diverticula (asterisk) after filling with viscous gel. (b) Endoscopic ultrasound (EUS) image of the pancreatic duct (arrow) and longitudinal view of the bile duct (black arrow) running behind the diverticula filled with the gel. (c, d) With the gel-filled diverticula, the pancreatobiliary ducts are delineated without interference by air. The papilla (arrowhead) was also gains better acoustic coupling without being compressed by the EUS probe.

use at the duodenum. Since the duodenum does not easily hold water due to anatomical factors, and is especially prone to air retention in patients with perampullary diverticula (PAD), GI-EUS was suggested to be effective (Fig. 1).

We evaluated eight consecutive patients (median age, 70 years; range 48–87 years) with PAD who underwent GI-EUS among 192 patients who underwent EUS between December 2020 and April 2021 in our hospital. Before starting GI-EUS, we removed any food residue stored in the perampullary diverticula and aspirated air in the duodenum. After detecting the pancreatic head on EUS, we filled the duodenum with gel (VISCOCLEAR; Otsuka Pharmaceutical Factory, Tokushima, Japan) via the scope working channel until the duodenal wall adequately extended (Fig. 2, Video S1).

Then, the intrapancreatic pancreatobiliary ducts and the papilla could be delineated without interference from air in the perampullary diverticula in all patients. GI-EUS procedures and this retrospective study were performed after approval by the Teine Keijinkai Hospital Institutional Review Board (approval number: 2-020408-00; registered date: 22 April 2021). Informed consent for study

participation was obtained in the form of an opt-out on the hospital's web-site.

The median amount of used gel was 90 (50–150) mL, median observational time was 6.5 (4.3–10.1) min. None of the patients experienced any complications. The final diagnoses were no biliary obstruction in five patients, low-grade branched-type intraductal papillary mucinous neoplasm in two, and suspected Lemmel's syndrome in one.

Gel immersion-EUS is safe and useful to delineate the intrapancreatic pancreatobiliary ducts in patients with perampullary duodenal diverticula.

CONFLICT OF INTEREST

A.K. RECEIVED HONORARIA as a lecture fee from Olympus Co., Tokyo, Japan, and is an Associate Editor of *Digestive Endoscopy*. All other authors declare no conflict of interest for this article.

REFERENCES

- 1 Yano T, Nemoto D, Ono K *et al.* Gel immersion endoscopy: A novel method to secure the visual field during endoscopy in

- bleeding patients (with videos). *Gastrointest Endosc* 2016; **83**: 809–11.
- 2 Hanaoka N, Ishihara R, Matsuura N *et al*. Esophageal EUS by filling water-soluble lubricating jelly for diagnosis of depth of invasion in superficial esophageal cancer. *Gastrointest Endosc* 2015; **82**: 164–5.
 - 3 Miyamoto S, Takahashi K, Ohya TR. New method of esophageal endoscopic ultrasonography with injected gel: Endoscopic ultrasonography-gel filling method. *Dig Endosc* 2021; **33**: e49–50.

SUPPORTING INFORMATION

ADDITIONAL SUPPORTING INFORMATION may be found in the online version of this article at the publisher's web site.

Video S1 This video shows the efficacy of the gel immersion method in pancreatobiliary endoscopic ultrasound in patients with periampullary duodenal diverticula.