

EUS-guided pancreatic duct drainage with rendezvous technique for post-Whipple pancreatic duct stone



Takeshi Okamoto, MD,^{1,2} Kenji Nakamura, MD, PhD,^{2,3} Ayaka Takasu, MD,² Hiroki Sunagawa, MD,⁴ Katsuyuki Fukuda, MD, PhD²

EUS-guided pancreatic duct (EUS-PD) drainage is a challenging procedure with a technical success rate of 81%, an adverse event rate of 21%, and a steep learning curve.^{1,2} In addition to difficulties in reaching and identifying the

pancreaticojejunal anastomosis (PJA), the lack of dedicated stone extraction devices for long-type double-balloon enteroscopes can make EUS-PD drainage rendezvous for pancreatic duct stones (PDS) particularly challenging.³ We present a

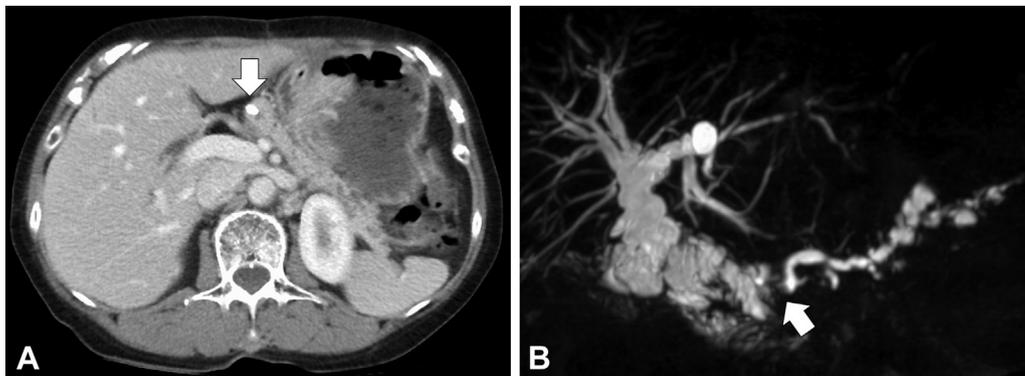


Figure 1. **A**, CT revealed a pancreatic duct stone near the pancreaticojejunal anastomosis (*arrow*). **B**, An obstructive pancreatic duct stone (*arrow*) and a dilated distal pancreatic duct were observed on magnetic resonance cholangiopancreatography.

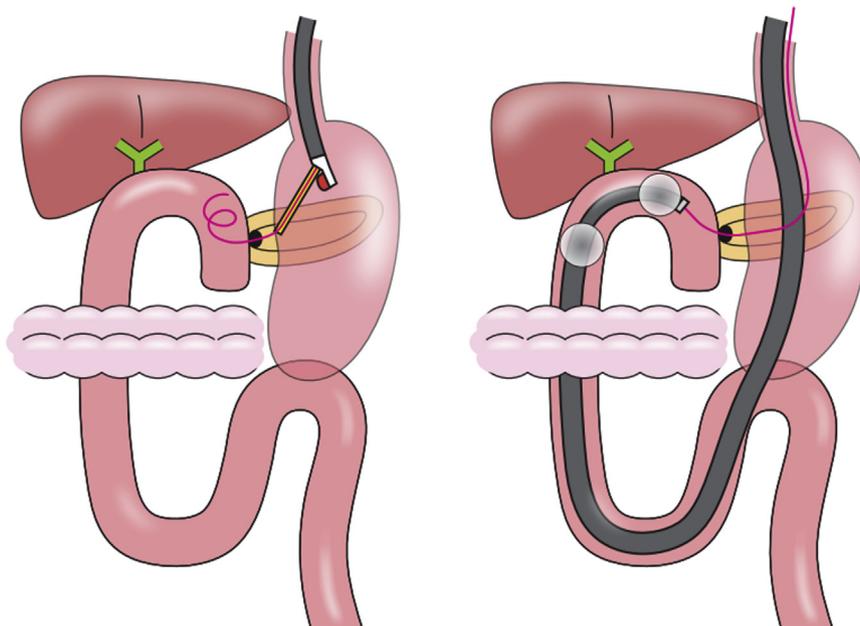


Figure 2. Schematic diagram of the procedure. **A**, The pancreatic duct was punctured from the stomach under endosonographic guidance, and a guide-wire was passed through the pancreaticojejunal anastomosis. **B**, A double-balloon enteroscope was then advanced to the anastomosis for the rendezvous technique, ultimately leading to plastic pancreatic stent placement.

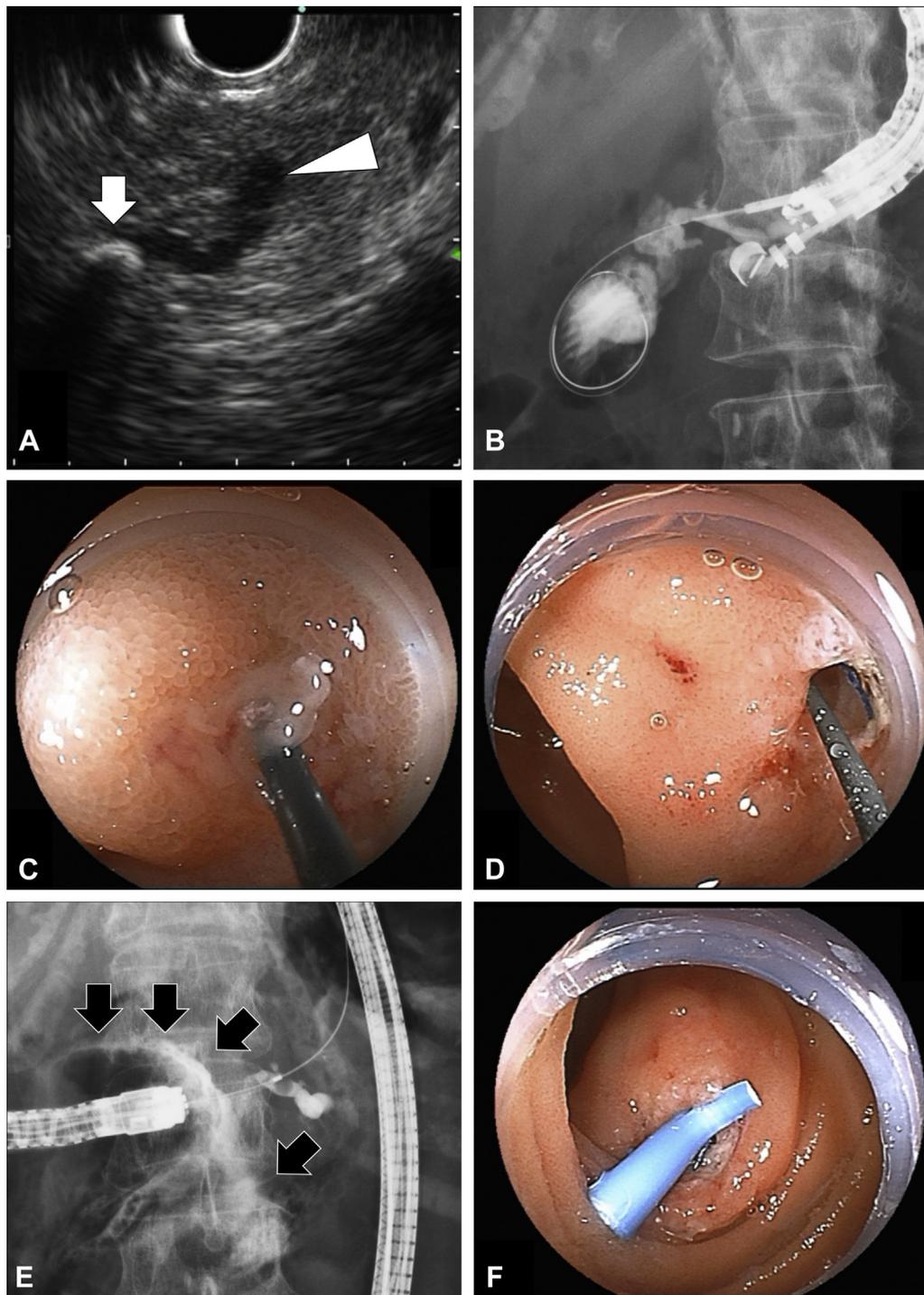


Figure 3. **A,** EUS revealed a 6-mm pancreatic duct stone (*arrow*) in a dilated pancreatic duct (*arrowhead*). **B,** After a transgastric puncture of the pancreatic duct, a guidewire was inserted through the pancreaticojejunal anastomosis. **C,** The enteroscope was advanced to the anastomosis and the guidewire was observed, revealing a stenosed pancreaticojejunal anastomosis. **D,** The anastomosis after a small incision using a sphincterotome and balloon dilation. Balloon dilation expanded the orifice to expose sutures from previous surgery, suggesting possible perforation. **E,** Fluoroscopy revealed contrast leakage into the retroperitoneum (*arrows*). **F,** A plastic stent was placed through the pancreaticojejunal anastomosis into the pancreatic duct.

case of EUS-PD drainage rendezvous in a patient with PJA stenosis and PDS.

A 73-year-old woman with a history of pylorus-preserving pancreaticoduodenectomy with Billroth-II reconstruction

for early stage ampullary adenocarcinoma presented with epigastric pain. Proton pump inhibitors and pancrelipase did not provide symptomatic relief. Laboratory values including tumor markers were within their normal ranges.

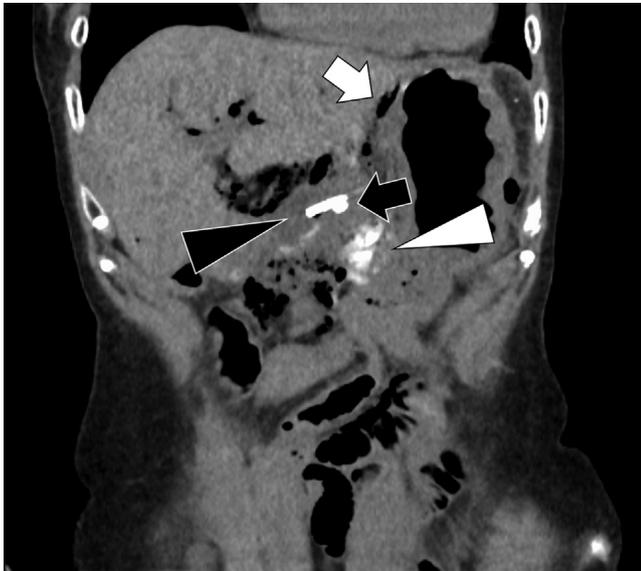


Figure 4. Follow-up CT (coronal view). Free air (*white arrow*) and contrast (*white arrowhead*) were observed in the retroperitoneum. The plastic stent (*black arrow*) and pancreatic duct stone (*black arrowhead*) are also visualized.

CT and magnetic resonance imaging revealed a PDS in a dilated pancreatic duct, without signs of pancreatitis (Fig. 1A and B). ERCP was attempted using a short type double balloon endoscopy (EN-580T, Fujifilm Holdings Corp, Tokyo, Japan). However, the anastomosis could not be reached owing to sharp bowel angulation resulting from adhesions. Despite reports of similar insertion success with short- and long-type double balloon endoscopy after Whipple resection,⁴ we switched to the long-type double balloon endoscopy (EI-580T, Fujifilm). The end of the afferent loop was reached, but the PJA could not be identified. Consent for EUS-PD drainage was therefore obtained (Fig. 2; Video 1, available online at www.giejournal.org).

A convex endosonoscope (GF-UCT260, Olympus Corp, Tokyo, Japan) was used to puncture the gastric stomach with a 19-gauge EUS-guided FNA needle (EZ Shot 3 Plus, Olympus) under EUS guidance. EUS and fluoroscopy both revealed a 6-mm PDS with distal pancreatic duct dilatation (Fig. 3A). A 0.025-inch guidewire (Visiglide2, Olympus) was advanced through the PJA. With the wire left in place, the endosonoscope was replaced with a long-type double balloon endoscopy (Fig. 3B). After the enteroscope was advanced to the anastomosis, the guidewire was grasped with biopsy forceps and retracted through the endoscopic channel (Fig. 3C). A small incision was made at the anastomosis using a sphincterotome (CleverCut 3V, Olympus), followed by balloon dilation (REN, 6 mm, Kaneka Medix Corp, Osaka, Japan) (Fig. 3D). Balloon dilation expanded the orifice to expose sutures from previous surgery, suggesting possible perforation. The Uneven Double Lumen Cannula (Piolax Medical Devices, Kanagawa, Japan) was

used to introduce a second guidewire. Fluoroscopy revealed contrast leakage into the retroperitoneum, confirming perforation (Fig. 3E). The transgastric wire was removed, and rapid attempts at PDS removal were made with a stone extraction basket and balloon. Because both proved unsuccessful, a plastic stent (Geenen, 7F, 5 cm, Cook Medical, Bloomington, Ind, USA) was placed (Fig. 3F).

Follow-up CT showed free air and contrast in the retroperitoneum (Fig. 4). Mild abdominal pain and elevations in inflammatory markers and pancreatic amylase were observed, all of which improved after 3 days of conservative treatment. Because the patient's epigastric pain resolved completely, a second attempt at PDS removal was made 1 month later, this time using the short-type double balloon endoscopy. Although the PJA was finally reached after 80 minutes, PDS removal with stone extraction baskets and balloons was unsuccessful. However, PJA stenosis and pancreatic duct dilation had improved owing to the previous procedure, and the PDS was no longer obstructing the anastomosis. The plastic stent was therefore removed without replacement. The patient remains asymptomatic at 6 months of follow-up.

EUS-PD drainage rendezvous is generally a last resort among endoscopic procedures, owing to its difficulty. An early report had a 33% success rate in 12 cases, with failures resulting from difficulties in EUS needle insertion and stricture passage.⁵ A recent report achieved 85% clinical success by combining double balloon endoscopy-assisted endoscopic retrograde pancreatography and EUS-PD drainage in patients with surgically altered anatomy.⁶ Drainage for PJA stricture and complete PDS removal were achieved in 91% and 80% of cases, respectively. Eleven patients had PJA strictures and PDS, as in our case, of which 1 was treated successfully with EUS-PD drainage rendezvous. With the advent of dedicated devices for EUS-PD drainage,⁷ higher success rates and lower adverse event rates may be expected in the future.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: EUS-PD, EUS-guided pancreatic drainage; PDS, pancreatic duct stone; PJA, pancreaticojejunal anastomosis.

REFERENCES

- Bhurwal A, Tawadros A, Mutneja H, et al. EUS guided pancreatic duct decompression in surgically altered anatomy or failed ERCP: a systematic review, meta-analysis and meta-regression. *Pancreatology* 2021;21:990-1000.
- Tyberg A, Bodiwala V, Kedia P, et al. EUS-guided pancreatic drainage: a steep learning curve. *Endosc Ultrasound* 2020;9:175-9.
- Matsushita M, Shimatani M, Ikeura T, et al. Single-balloon or short double-balloon enteroscope for ERCP in patients with surgically altered anatomies. *Gastrointest Endosc* 2011;73:415-6.

4. Itokawa F, Itoi T, Ishii K, et al. Single- and double-balloon enteroscopy-assisted endoscopic retrograde cholangiopancreatography in patients with Roux-en-Y plus hepaticojejunostomy anastomosis and Whipple resection. *Dig Endosc* 2014;26(Suppl 2): 136-43.
5. Barkay O, Sherman S, McHenry L, et al. Therapeutic EUS-assisted endoscopic retrograde pancreatography after failed pancreatic duct cannulation at ERCP. *Gastrointest Endosc* 2010;71:1166-73.
6. Kogure H, Sato T, Nakai Y, et al. Endoscopic management of pancreatic diseases in patients with surgically altered anatomy: clinical outcomes of combination of double-balloon endoscopy- and endoscopic ultrasound-guided interventions. *Dig Endosc* 2021;33: 441-50.
7. Matsunami Y, Itoi T, Sofuni A, et al. Evaluation of a new stent for EUS-guided pancreatic duct drainage: long-term follow-up outcome. *Endosc Int Open* 2018;6:E505-12.

Department of Hepato-Biliary-Pancreatic Medicine, Cancer Institute Hospital of Japanese Foundation for Cancer Research, Tokyo, Japan (1), Department of Gastroenterology, St. Luke's International Hospital, Tokyo, Japan (2), Department of Gastroenterology, Tokyo Dental College, Ichikawa General Hospital, Chiba, Japan (3), Department of Gastrointestinal Surgery, Nakagami Hospital, Okinawa, Japan (4).

If you would like to chat with an author of this article, you may contact Dr Okamoto at tak@afia.jp.

Copyright © 2021 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.vgie.2021.08.004>

Facebook

Follow *VideoGIE* on Facebook to receive the latest news, updates, and article links. Visit <https://www.facebook.com/videogiejournal/> and keep checking back to view our most recent posts.