



Pancreatic stones treated via an EUS-guided pancreaticogastrostomy with a fully-covered self-expandable metal stent

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CASE PRESENTATION

A 42-year-old man who had undergone a distal pancreatectomy 2 years earlier for chronic pancreatitis due to alcohol, with pancreatic stones, presented because of severe abdominal pain. Blood tests revealed elevated inflammatory markers (white blood cells: 8570/uL; C-reactive protein: 20.1 mg/dL) and pancreatic enzymes (amylase:

273 U/L; lipase: 340 U/L). CT depicted pancreatic stones up to 1 cm in size in the entire pancreatic parenchyma and main pancreatic duct (MPD) (Fig. 1). Obstructive pancreatitis caused by pancreatic stones was diagnosed. Transpapillary removal of the stones was attempted, but the MPD could not be approached because of the pancreatic stones near the duodenal papilla. Next, we attempted to approach the MPD via the transgastric route with EUS guidance.

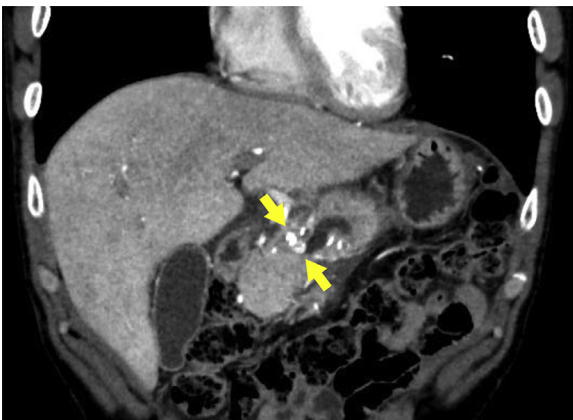


Figure 1. CT on admission depicted acute pancreatitis and pancreatic stones in the main pancreatic duct (yellow arrow).

PROCEDURE

EUS-guided pancreaticogastrostomy (EUS-PG) was performed. The distal MPD was punctured with a 19-gauge EUS fine-needle aspiration needle (EZ-Shot 3 plus; Olympus, Tokyo, Japan), and a 0.025-inch guidewire (Visiglide2; Olympus) was placed into the MPD. The fistula was dilated using a 6F diathermic dilator (Cysto-Gastro-Set; Endo-Flex, GmbH, Voerde, Germany) and a 6-mm balloon catheter (REN; biliary dilation catheter, Kaneka Co, Inc, Osaka, Japan), and a 7F plastic gastropancreatic stent (Flexima; Boston Scientific Corp, Marlborough, Mass, USA) was placed (Fig. 2). One week later, a catheter (MTW ERCP catheter; ABIS, Hyogo, Japan) was inserted through the side of the plastic gastropancreatic stent into the MPD,

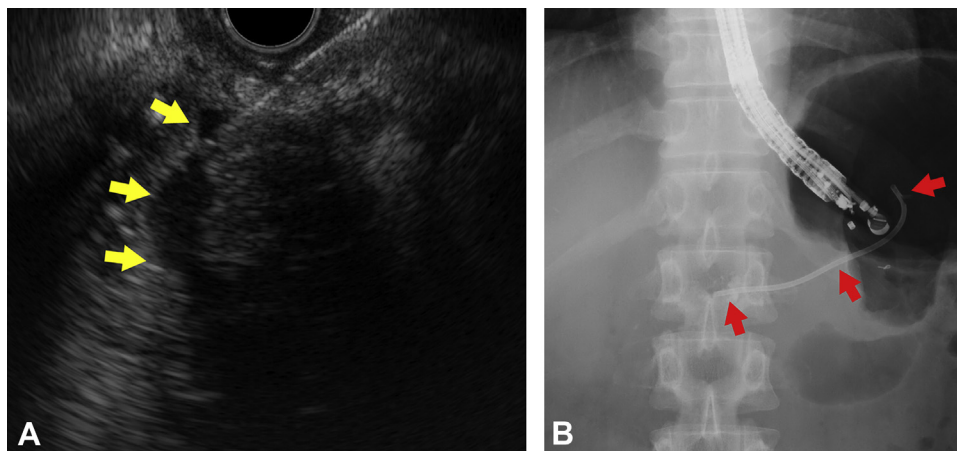


Figure 2. EUS-guided pancreaticogastrostomy was performed, and a plastic gastropancreatic stent was placed. **A**, Puncturing the main pancreatic duct (yellow arrow). **B**, Plastic gastropancreatic stent placement (red arrow).

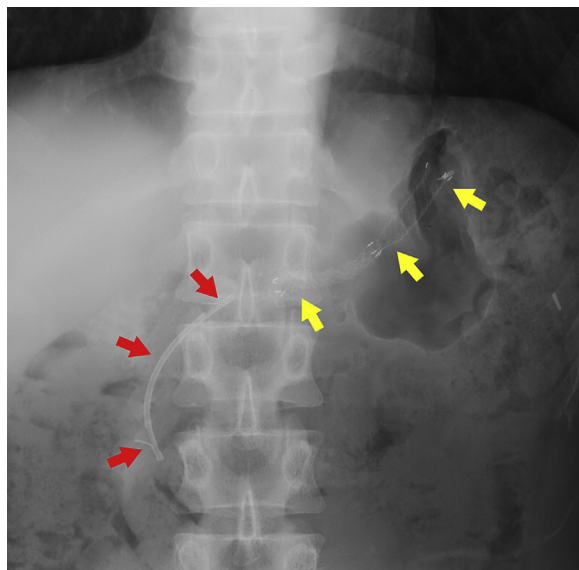


Figure 3. A fully covered self-expandable metal stent was placed transgastroscopically (yellow arrow), and a transpapillary plastic pancreatic duct stent was placed using a rendezvous technique (red arrow).

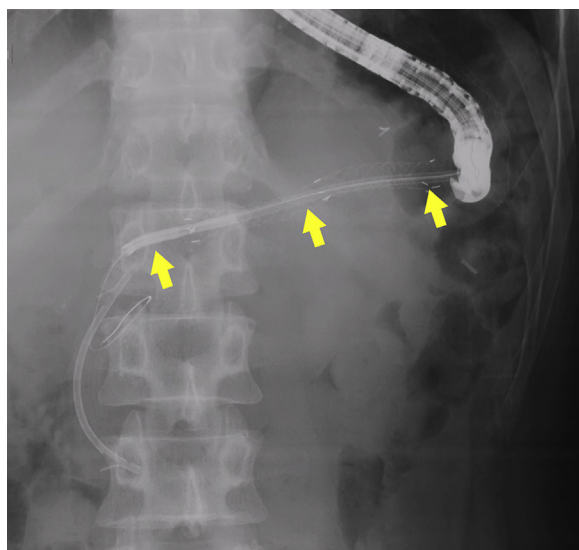


Figure 4. A digital single-operator pancreatoscope (yellow arrow) was inserted into the main pancreatic duct through the fully covered self-expandable metal stent.

and a 0.025-inch guidewire (Visiglide2) was placed into the duodenum. Next, a 7F plastic stent (Through & Pass; Gadelius Medical, Tokyo, Japan) was placed in a retrograde fashion into the MPD using the rendezvous technique. Two weeks later, a catheter (MTW) and a guidewire (Visiglide2) were inserted through the side of the plastic stent, and the guidewire was placed into the duodenum. The plastic gastropancreatic stent was removed and left in the stomach initially, an 8-cm × 8-mm fully covered self-expandable metal stent (FCSEMS) (HANAROSTENT; Bos-

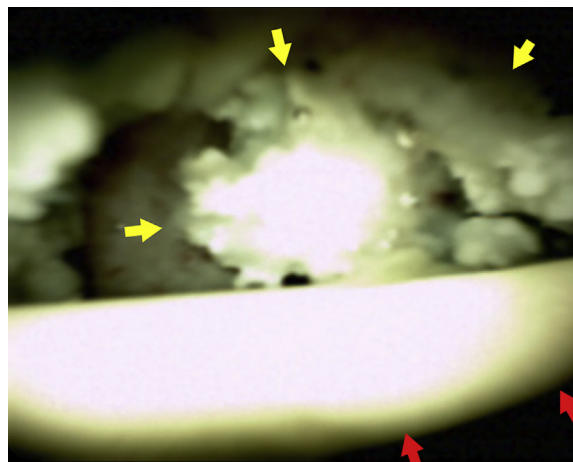


Figure 5. Pancreatoscopy revealed pancreatic stones in the main pancreatic duct (yellow arrow), and a transpapillary plastic pancreatic duct stent was placed (red arrow).

ton Scientific Corp) was placed at the fistula, and the removed plastic stent was retrieved (Fig. 3). Three days later, a digital single-operator pancreatoscope (SpyGlass DS; Boston Scientific Corp) was inserted into the MPD through the FCSEMS (Fig. 4). Pancreatic stones were identified in the MPD but could not be safely fragmented with electronic hydraulic lithotripsy (EHL) because of the narrow and curved lumen of the MPD (Fig. 5; Video 1, available online at www.giejournal.org). The pancreatic stones were removed using a basket catheter (FG-V435P; Olympus) and a balloon catheter (Multi-3V Plus; Olympus) through the FCSEMS under fluoroscopic guidance. After treatment of the pancreatic stones, the transpapillary plastic stent was left in place and the self-expandable metal stent (SEMS) was replaced with a 5F plastic nasobiliary drainage tube (SilkyPass; Boston Scientific Corp) as a pancreatic duct drainage stent. The next day, the plastic tube was removed and the pancreaticogastrostomy closed without any intervention. Six months later, the patient's abdominal pain had resolved, and no pancreatic stones were detected in the MPD by CT images (Fig. 6).

DISCUSSION

Endoscopic treatment is minimally invasive and is preferred for pancreatic stones associated with chronic pancreatitis,¹ but pancreatic stones are sometimes difficult to treat via a standard transpapillary approach. A transgastric approach is an alternative route,^{2,3} and EUS-PG with an FCSEMS as well as a plastic stent has been reported in recent years.⁴ A few cases have been reported in which pancreatoscopy was performed through EUS-PG.^{5,6} In these cases, it took more than 6 weeks after EUS-PG to insert the pancreatoscope into the MPD, and balloon dilation for the fistula was also required to perform the

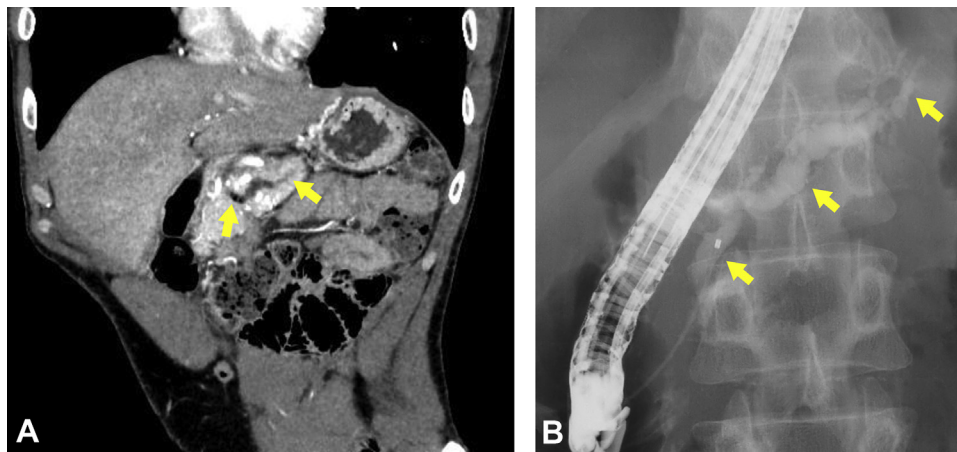


Figure 6. Pancreatic stones were no longer evident in the main pancreatic duct 6 months after EUS-guided pancreaticogastrostomy (yellow arrow). **A,** CT image. **B,** ERCP image.

pancreatoscopy. Insertion of the pancreatoscope into the MPD after only balloon dilation may carry the risk of pancreaticogastrostomy breakage. Furthermore, if there is insufficient space between the pancreatoscope and the pancreaticogastrostomy, the intraductal pressure of the MPD may increase injection of water from the pancreatoscope, increasing the risk of pancreatic duct damage and pancreatitis. In the current case, an FCSEMS was placed to prevent pancreaticogastrostomy collapse, and pancreatoscopy for pancreatic stone removal was safely performed 2 weeks after EUS-PG. Next, the water injected from the pancreatoscope flowed into the stomach through the SEMS and into the duodenum through the transpapillary stent, and a good field of view was obtained by injecting water without increasing the intracavitary pressure of the MPD. Although EHL could not be performed in the current case because of the morphology of the MPD, it may be useful to remove pancreatic stones after performing EHL in some cases of intractable intraductal pancreatic stones. Removal of pancreatic stones via a transgastric route with an FCSEMS created by EUS-PG is a useful and safe treatment option in patients in whom a conventional transpapillary approach is unsuccessful.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: EHL, electronic hydraulic lithotripsy; EUS-PG, endoscopic ultrasound-guided pancreaticogastrostomy; FCSEMS, fully-covered self-

expandable metal stent; MPD, main pancreatic duct; SEMS, self-expandable metal stent.

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<https://doi.org/10.1016/j.vgie.2021.05.014>