Management of a postoperative fistula after pancreatic left resection using percutaneous endoscopy-assisted transpapillary pancreatic duct drainage via its stump

Viliam Masaryk, MUDr., Uwe Will, Prof. Dr. med., Frank Fueldner, Dr. med., Frank Meyer, Prof. Dr. med.

Postoperative pancreatic fistula is a potential adverse event after pancreatic resection. Pancreatic duct drainage (endoscopic, percutaneous) is a therapeutic option. We describe a new approach via percutaneous endoscopy.

CASE

A 67-year-old patient underwent left pancreatic resection for ductal adenocarcinoma. Additional resection of the gastroenterostomy (status post-Billroth-II gastric resection) was performed with subsequent reconstruction according to Roux-en-Y.

On the 10th postoperative day, there was an increase in inflammation parameters. A CT scan was performed, and a peripancreatic and encapsulated fluid accumulation was found caudal of the left hepatic lobe, highly suspicious of an abscess (Fig. 1). After puncture (*Candida glabrata* was cultivated), a CT-guided percutaneous 10F drainage was inserted. Over several days, the drainage fluid showed high pancreatic ferment activity (initial lipase level, 0.7 μmol/L; on the 19th postoperative day, 1238 μmol/L), so it was assumed that a secondary pancreatic duct leakage at the resection line had occurred. An endoscopic attempt at transpapillary or EUS-guided drainage failed.

After administration of contrast (Peritrast 300/60%, 400 mg amidotrizoic acid-lysine salt, 330 mg sodium amidotrizoate; Dr. Franz Köhler Chemie, Bensheim, Germany) via percutaneous drainage, peripancreatic fluid with communication to the pancreatic duct and a stenosis in the area of papilla of Vater was observed. We decided to drain the pancreatic duct via the percutaneous route (Fig. 2).

Inserting a wire (Jagwire, 0.035-inch; Boston Scientific, Marlborough, Mass, USA) into the pancreatic duct under high pancreatic ferment activity (initial lipase level, 0.7 μmol/L; on the 19th postoperative day, 1238 μmol/L), so it was assumed that a secondary pancreatic duct leakage at the resection line had occurred. An endoscopic attempt at transpapillary or EUS-guided drainage failed.

After administration of contrast (Peritrast 300/60%, 400 mg amidotrizoic acid-lysine salt, 330 mg sodium amidotrizoate; Dr. Franz Köhler Chemie, Bensheim, Germany) via percutaneous drainage, peripancreatic fluid with communication to the pancreatic duct and a stenosis in the area of papilla of Vater was observed. We decided to drain the pancreatic duct via the percutaneous route (Fig. 2).

Figure 2. Fluoroscopy shows intra-abdominal cavity (former surgical field) filled with contrast medium (Peritrast 300/60%; 400 mg amidotrizoic acid lysine salt, 330 mg sodium amidotrizoate; Dr. Franz Köhler Chemie, Bensheim, Germany) via percutaneous drainage 10 days after the drainage. The pancreatic duct and the stenosis in the papillary region are contrasted. The cause of the stenosis is unclear. Abdominal ultrasound and CT revealed no abnormalities in this area. Endoscopic visualization was not possible.
fluoroscopic control failed. A bougienage of the percutaneous access to 21F was then performed. The attempt to access the pancreatic duct with a 10F digital cholangioscope (Boston Scientific, Marlborough, Mass, USA) failed because of fluid and debris obscuring the view. By random probing, the wire was inserted through a false passage (Fig. 3).

Using a thin gastroscope (GIF-XP190N; Olympus, Tokyo, Japan) with an outer diameter of 5.4 mm and a working channel of 2.2 mm, we could achieve sufficient irrigation and suction with subsequent inspection of the cavity. Suture material and necroses were found (Fig. 4). After several attempts at probing in different directions, we found the porus to the pancreatic duct, and passage

Figure 3. Fluoroscopy: initial probing with Spyglass DS (Boston Scientific, Marlborough, Mass, USA) after bougienage of the percutaneous access. It was not possible to probe the pancreatic duct. The tip of the wire was positioned through a false passage.

Figure 4. Endoscopic view of the cave with visible sutures (white arrow). The porus of the pancreatic duct stump (black arrow) was only discovered through multiple manipulation attempts with the wire.

Figure 5. Successful insertion of the guide wire (Jagwire; Boston Scientific, Ratingen, Germany) probing to the duodenum via the stump of the pancreatic duct (shown in further fluoroscopy sequences).

Figure 6. Wire-guided balloon dilatation (10-mm dilatation balloon, CRE, PRO Wireguided 10 mm; Boston Scientific, Marlborough, Mass, USA) of the stenosis to 10 mm. Fluoroscopy shows the balloon is completely blocked.
of a wire up to the small intestine via the papilla of Vater was possible (Fig. 5).

After difficult positioning of the 10-mm dilatation balloon (CRE, PRO Wireguided 10 mm; Boston Scientific) at the stenotic segment, the stenosis could be dilated (Fig. 6). Subsequently, an 8.5F double-pigtail drainage (Biliary Stent SU; ENDO-FLEX GmbH, Voerde, Germany) was inserted. The distal end of the pigtail was placed in the duodenum and the proximal end in the walled-off necrosis, with resulting splinting of the pancreatic duct (Fig. 7). Next, the percutaneous drainage could be removed. Ultrasound control revealed only a collection of residual fluid. Because of substantial clinical improvement, a control CT scan was not favored. There was no exacerbation of the pancreatic leakage, and the patient could be discharged on the fifth postinterventional day.

Three months later, the pigtail was electively removed. Endoscopically (PCF-PH190L, Olympus), no visualization of the papilla could be achieved, but the drainage could be removed with grasping forceps (Fig. 8). Thus, the cause of the papilla-associated stenosis remained unclear.

No recurrence of the fistula or the tumor occurred in the 11-month follow-up period (Video 1, available online at www.giejournal.org).

DISCUSSION

We determined that percutaneous (internal) pancreatic duct drainage is a possible approach to control pancreatic fistulas when conventional endoscopic therapy is not possible. An endoscopic percutaneous access into the peri-

pancreatic fluid allows for visual control and easier locating of the pancreatic duct. We found that internal drainage is clearly beneficial for patient comfort and for preventing tissue-altering enzymatic effects.

DISCLOSURE

All authors disclosed no financial relationships.

REFERENCES

1. Watanabe Y, Ueda K, Nakamura S, et al. Endoscopic transpapillary pancreatic duct stent placement for symptomatic peripancreatic fluid collection caused by clinically relevant postoperative pancreatic fistula after distal pancreatectomy. Surg Laparosc Endosc Percutan Tech 2019;29:261-6.
2. Mizandari M, Azrumelashvili T, Kumar J, et al. Percutaneous image-guided pancreatic duct drainage: technique, results and expected benefits. Cardiovasc Intervent Radiol 2017;40:1911-20.
3. Larsen M, Kozarek R. Management of pancreatic ductal leaks and fistulae. J Gastroenterol Hepatol 2014;29:1360-70.
4. Gmeinwieser J, Holstege A, Zirngibl H, et al. Successful percutaneous treatment of infected necrosis of the body of the pancreas associated with segmental disruption of the main pancreatic duct. Gastrointest Endosc 2000;52:413-5.
5. Ota Y, Kikuyama M, Suzuki S, et al. Percutaneous pancreatic-duct puncture with rendezvous technique can treat stenotic pancreaticojejunostomy. Dig Endosc 2010;22:228-31.
6. Satoh T, Kikuyama M, Yokoi Y, et al. Dual drainage using a percutaneous pancreatic duct technique contributed to resolution of severe acute pancreatitis. Clin J Gastroenterol 2017;10:191-5.
7. Hirota M, Kanemitsu K, Takamori H, et al. Percutaneous transfistulous pancreatic duct drainage and interventional pancreaticojejunostomy
as a treatment option for intractable pancreatic fistula. Am J Surg 2008;196:280-4.
8. Kamo M, Miyazawa R, Nisiyama T, et al. Percutaneous transgastric pancreatic duct drainage for pancreaticojejunal leak after pancreaticoduodenectomy. Diagn Interv Radiol 2019;25:471-2.
9. Will U, Földner F, Reichel A, et al. EUS-guided drainage of the pancreatic duct (EUPD)–promising therapeutic alternative to surgical intervention in case of symptomatic retention of the pancreatic duct and unsuccessful ERP. Zentralbl Chir 2014;139:318-25.
10. Will U, Reichel A, Füldner F, et al. Endoscopic ultrasonography-guided drainage for patients with symptomatic obstruction and enlargement of the pancreatic duct. World J Gastroenterol 2015;21:13140-51.
11. Zerem E, Imsirović B, Loga-Zec S, et al. Treatment of recurrent pancreatic pseudocysts with proven communication between pseudocyst and pancreatic duct by long-term percutaneous drainage. Ann Acad Med Singap 2015;44:542-4.

Department of Gastroenterology, Hepatology and General Internal Medicine, Municipal Hospital ("SRH Wald-Klinikum Gera GmbH"), Gera, Germany (1), Department of General, Abdominal, Vascular and Transplant Surgery, University Hospital, Magdeburg, Germany (2).

If you would like to chat with an author of this article, you may contact Dr Will at Uwe.Will@srh.de.

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.2020.12.006

**VideoGIE Quiz**

Think you can outsmart VideoGIE? Try your luck with our new Quiz series. Using cases published in VideoGIE, we post questions designed to improve the education of our fellows. Go to http://www.videogie.org to submit your answer, and keep checking back for more quizzes!