

Endoscopic Ultrasound-Guided Rendezvous Procedure for a Nondilated, Leaking Pancreatic Duct

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ABSTRACT

Pancreatic duct (PD) leak leading to pancreatic ascites is a serious complication of chronic pancreatitis. Endoscopic management with endoscopic retrograde cholangiopancreatography (ERCP) has been found to be successful; however, if selective cannulation of the PD is unsuccessful, an endoscopic ultrasound-guided rendezvous procedure can help in bridging PD leaks, provided the duct is dilated. We report a successful endoscopic ultrasound-guided rendezvous procedure in a patient with PD leak, pancreatic ascites, and a nondilated duct with failed ERCP who was a poor candidate for surgery. The pancreatic ascites resolved following the procedure.

INTRODUCTION

Pancreatic duct (PD) leak due to PD disruption and resultant ascites is a serious complication of chronic pancreatitis. It is uncommon for this condition to complicate acute necrotizing pancreatitis. While approximately 40% of patients with acute pancreatitis present with fluid collection, pancreatic ductal disruption is rare.¹ The management options for pancreatic ascites include medical therapy, endotherapy, or surgical management.

For medical treatment, the patient is kept nil-per-oral with total parenteral nutrition and parenteral somatostatin. The efficacy of medical management has been poor, and most patients require endoscopic or surgical management. The surgical approach consists of partial pancreatic resection, lateral pancreatico-jejunostomy, or Whipple resection.² However, surgery is associated with a mortality rate of 8-11% and a recurrence rate of 15%.³⁻⁵

Endoscopic management of PD leaks has been found to be safe and successful with a favorable outcome. Endoscopic management consists of endoscopic retrograde cholangiopancreatography (ERCP), selective cannulation of the PD, and pancreatic sphincterotomy followed by stent placement to bridge the disrupted PD.^{6,7} The outcome of endotherapy is highly variable and is influenced by multiple patient-related and procedure-related factors.⁷⁻⁹ Selective cannulation of the PD is a prerequisite for endotherapy. When ERCP fails to achieve selective cannulation, endoscopic ultrasound (EUS)-guided rendezvous procedure may be useful to access the PD for endotherapy. Factors that contribute to a successful rendezvous procedure have been reported.^{7,9} Among the various factors, a dilated PD seems to be essential for a successful EUS rendezvous procedure. A nondilated PD can be technically difficult and may pose a higher risk for trauma and pancreatitis.⁷ Moreover, EUS-guided rendezvous in a nondilated PD has not been reported in the literature.

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CASE REPORT

A 64-year-old man with a history of alcohol abuse presented with intermittent abdominal pain and progressive abdominal distension. He had significant weight loss of 10 kg along with steatorrhea. He was found to have an atrophic pancreas with calcifications and gross ascites on contrast-enhanced computed tomography of the abdomen. Magnetic resonance imaging (MRI) of the abdomen with magnetic resonance cholangiopancreatography (MRCP) showed a nondilated PD with a leak at the genu and no obvious stricture. Ascitic fluid analysis showed a high amylase of 20,000 IU/L. The patient was initially managed conservatively with nasojejunal feeds and subcutaneous octreotide 200 μ g every 8 hours. He had progressive distension of the abdomen with ascites requiring repeated large-volume paracentesis. ERCP with transpapillary stent placement through the major papilla with a standard sphincterotome and guidewire (0.035") technique was unsuccessful. Cannulation with a 3-Fr tapered-tip cannula and guidewire (0.018") was also unsuccessful. A needle-knife papillotomy also failed. Due to the failure of standard techniques, we turned our attention to the minor papilla for access to the duct of Wirsung of a pancreas divisum. This was also unsuccessful using a tapered-tip cannula and guidewire (0.018"), even with a minor papillotomy. PD cannulation was unsuccessful through the major and minor papillae. The patient was a poor candidate for surgery due to severe cachexia and hypoalbuminemia. We performed an EUS-guided rendezvous procedure to place an endo-prostheses to bridge the area of contrast extravasation into the peritoneal cavity.

The procedure was done under general anesthesia with the patient in a prone position. Using a curved linear array echoendoscope (GF-UCT 180, Olympus Medical Systems, Upper Saucon Township, PA), the PD was visualized from the stomach and measured 2.6 mm in diameter. A PD diameter \geq 5 mm is considered to be a dilated PD.⁷ The PD was punctured, and contrast was injected using a 19-G EUS fine-needle aspiration (FNA) needle (ECHO HD 19A, Cook Medical, Bloomington, IN). Pancreatography showed leakage of contrast from the PD at the genu (Figure 1). There was no stricture or calculi in the PD. A 0.025-in guidewire (VisiGlide, Olympus Medical Systems) was passed via the FNA needle into the PD. As it was advanced, the wire exited through the minor papilla, suggestive of pancreas divisum (Figure 2).

The EUS scope and the FNA needle were removed with the guidewire in place. A side-viewing duodenoscope (TJF-Q 180 V, Olympus Medical Systems) was then passed into the duodenum. Instead of grabbing the guidewire with a snare and advancing it through the ERCP channel, a 5-Fr ERCP cannula (Boston Scientific, Marlborough, MA) was introduced through the biopsy channel of the duodenoscope. The tip of the cannula was refashioned to form a v-shaped wedge so that it could "rail-road" over the guidewire exiting the minor papilla

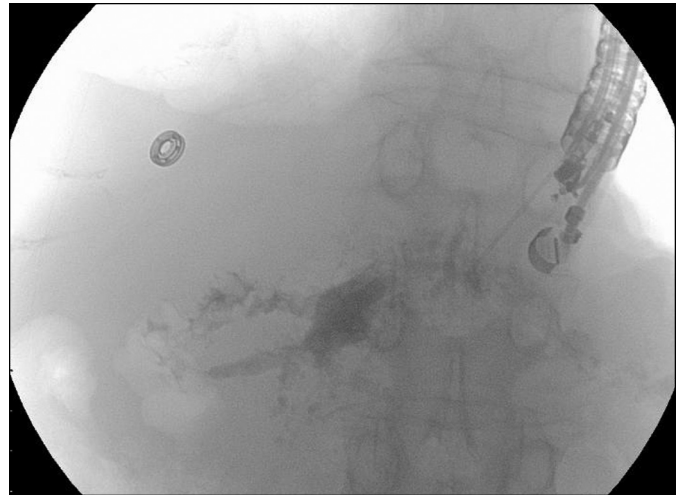


Figure 1. Endoscopic ultrasound-guided transgastric pancreatogram showing PD leak from the genu.

(Figure 3). With this technique, the catheter was easily introduced into the dorsal PD through the minor papilla. Another 0.025-in guidewire (VisiGlide, Olympus Medical Systems) was advanced through the cannula into the pancreatic duct and then negotiated across the leak (Figure 4).

The guidewire that was already stationed in the dorsal duct through the EUS endoscope was then removed. The second guidewire was maneuvered into the tail of the pancreas, and a plastic stent (7-Fr, 12-cm Amsterdam stent) was successfully deployed (Figure 5). The patient had no immediate or delayed complications, and his ascites completely resolved in 7 days.

DISCUSSION

PD disruption and resultant leaks or fistulae are uncommon complications of chronic pancreatitis and severe acute

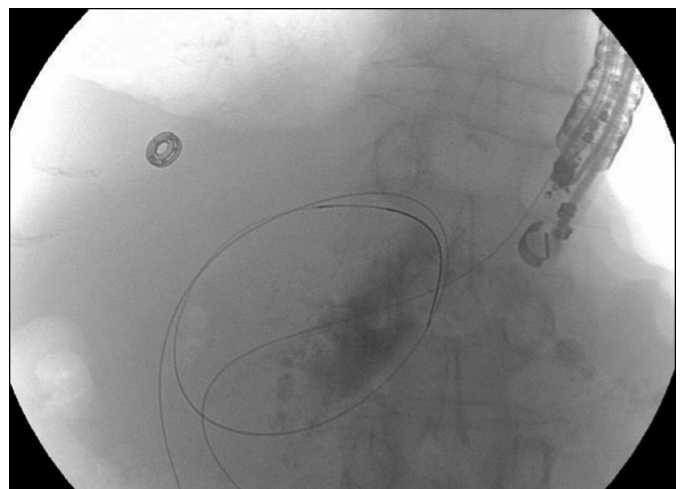


Figure 2. Guidewire advanced across the minor papilla into the duodenum.

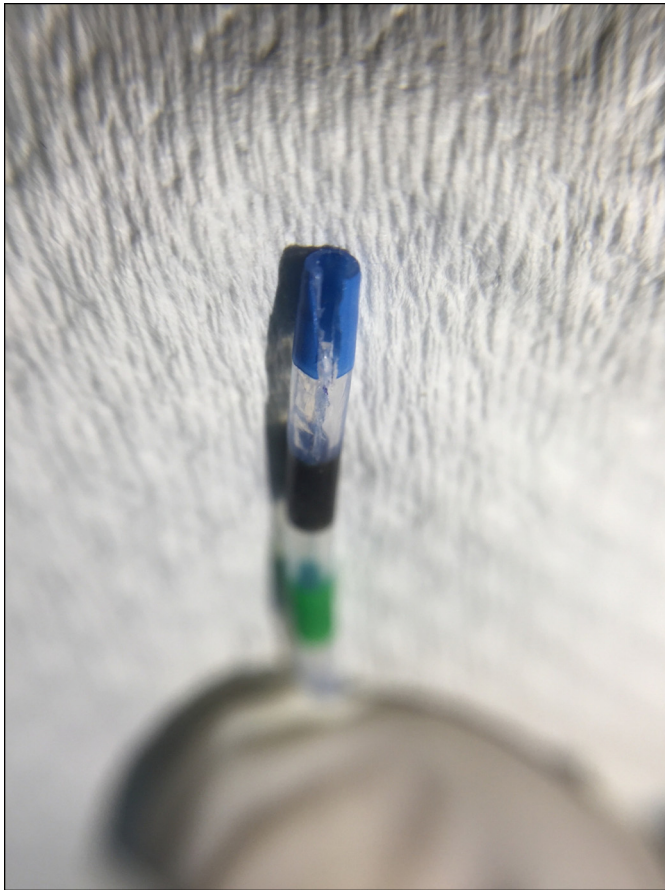


Figure 3. Modification of the ERCP cannula into a wedge.

necrotizing pancreatitis.¹ In chronic pancreatitis, the leak may be complicated with a stricture or calculi. Clinical manifestations of the leak depends upon its location and size. The initial presentation is abdominal pain with abdominal distension or shortness of breath, as well as anorexia/cachexia.¹

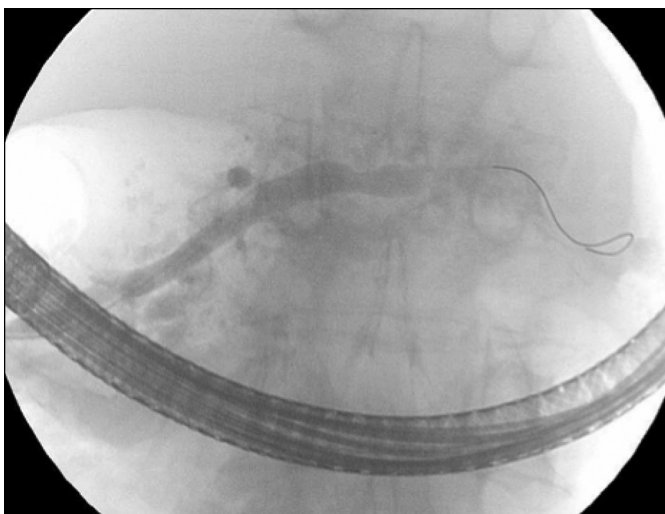


Figure 4. Transpapillary placement of the guidewire to bridge the PD leak.

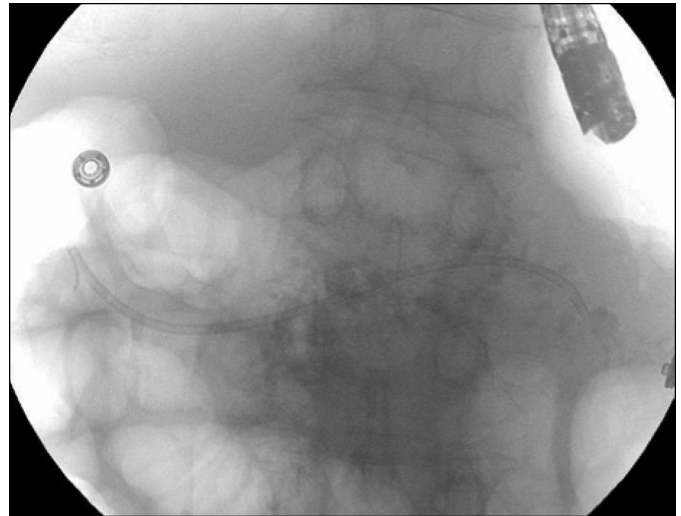


Figure 5. A 7-F PD stent deployed across the PD leak.

Diagnosis of a ductal disruption with leak is often difficult and may require multiple imaging studies.^{1,6} A fluid collection that is increasing in size could imply an active leak. Ascitic/pleural fluid analysis with high amylase levels are strongly suggestive of a leak, but this is seldom helpful in localization.^{1,3} MRI with MRCP appears to be the best noninvasive test in identifying leaks. In one series, 23 patients with suspected PD disruptions were evaluated with MRI and MRCP, and the PD disruption was correctly identified and localized in 21 (91%) of the patients.^{10,11} With smaller leaks, MRCP alone identified the leak in only 67% of the patients.¹² ERCP with contrast injection demonstrating contrast extravasation is the gold standard for the diagnosis of a PD leak. It can give additional information such as the location of the leak and the presence of stones or strictures in the PD. Nevertheless, unsuccessful cannulation and inadequate pancreatography is a major problem that is seen in 10% of the patients undergoing ERCP.¹³⁻¹⁵

Successful endoscopic management of PD leaks depends on multiple factors such as size and location of the leak, presence of strictures/stones, and the endoscopist's expertise. The reported clinical and technical success rates range from 55-100% and 82-100%, respectively.^{6,16-19} The major reasons for technical failure have been failure of selective cannulation of the PD and an inability to advance the guidewire beyond a stricture/site of leak.^{6,20,21}

When selective cannulation of the PD is unsuccessful, EUS-guided PD access and the rendezvous technique can be employed. Several investigators have described EUS-guided rendezvous procedures with successful deployment of stents in chronic pancreatitis with dilated PD. In a review of 12 case series ($n = 52$ patients) involving EUS-guided rendezvous PD stenting, all but one case had successful pancreatic rendezvous procedures. However, it is important to note that all patients had a dilated PD.⁷ There are no reports of a

successful rendezvous procedure for PD leaks with a PD diameter of <3 mm. In a case report in which an EUS-guided rendezvous procedure was attempted in a nondilated PD, although the puncture was achieved using a 22-G needle and a 0.018-in guidewire was introduced, the guidewire could not be manipulated across the papilla into the duodenum.²²

In our case, the patient had a duct leak from the genu of the PD and pancreatic ascites. ERCP performed by an experienced endoscopist had failed through the major and minor papillae, and surgical management was not possible due to the poor functional status of the patient. Our facility performs >900 ERCP and EUS procedures annually, with a successful PD cannulation rate of >95%. EUS-guided rendezvous was successful with transgastric access of the PD, which was not dilated.

In addition, we used a novel technical modification for the selective cannulation of the PD over the existing guidewire. The wedge-shaped cannula tip facilitated easy “rail-roading” over the guidewire. This technique facilitates cannulation over the wire and can reduce procedure time. During the conventional rendezvous technique, the guidewire is brought out through the biopsy channel of the scope by applying a constant traction on it and ensuring the wire is taut throughout the whole process. This may produce trauma to the papilla and the mucous membranes of the duodenum, stomach and esophagus. This can be avoided using the rail-road cannulation technique in which the guidewire remains free in the duodenum.

DISCLOSURES

Author contributions: A. Prakash and H. Rao B drafted the manuscript. A.K. Anoop performed the endoscopic retrograde pancreaticography. R.P. Venu revised the manuscript and is the article guarantor.

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Informed consent was obtained for this case report.

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