Pancreaticoureteral Fistula: A Rare Complication of Chronic Pancreatitis

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Abstract

Context: Chronic pancreatitis is an inflammatory condition that may result in progressive parenchymal damage and fibrosis which can ultimately lead to destruction of pancreatic tissue. Fistulas to the pleura, peritoneum, pericardium, and peripancreatic organs may form as a complication of pancreatitis. This case report describes an exceedingly rare complication, pancreaticoureteral fistula (PUF). Only two additional cases of PUF have been reported. However, they evolved following traumatic injury to the ureter or pancreatic duct. No published reports describe PUF as a complication of pancreatitis. Case Report: A 69-year-old Hispanic female with a past medical history of cholecystectomy, pancreatic pseudocyst, and recurrent episodes of pancreatitis presented with severe, sharp, and constant abdominal pain. Upon imaging, a fistulous tract was visualized between the left renal pelvis (at the level of an upper pole calyx) and the pancreatic duct and a ureteral stent was placed to facilitate fistula closure. Following the procedure, the patient attained symptomatic relief and oral intake was resumed. A left retrograde pyelogram was repeated 2 months after the initial stent placement and demonstrating no evidence of a persistent fistulous tract. Conclusion: Due to PUF’s unclear etiology and possible variance of presentation, it is important for physicians to keep this rare complication of pancreatitis in mind, especially when evaluating a patient with recurrent pancreatitis, urinary symptoms and abnormal imaging within the urinary collecting system and pancreas.

Keywords: Chronic pancreatitis, complication, fistula, fistulous tract, pancreas, pancreatitis, pancreaticoureteral, pancreaticoureteral fistula (PUF), ureter

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Introduction

Chronic pancreatitis is an inflammatory condition that may result in progressive parenchymal damage and fibrosis. The destruction of pancreatic tissue can lead to exocrine as well as endocrine dysfunction in addition to biliary, duodenal or gastric obstruction, pseudocysts, pancreatic ascites, pleural effusion, splenic or portal vein thromboses, splenic artery pseudoaneurysm, cancer and pancreatic fistulae. Pancreatic fistulae have been reported to involve the pleura, peritoneum, pericardium, and other peripancreatic organs (i.e., esophagus, stomach, duodenum, and colon).[1-4] This case report describes a pancreaticoureteral fistula — An exceedingly rare complication of pancreatitis, manifested as a fistula between the pancreatic duct and the ureter.

Case Presentation

A 69-year-old Hispanic female with a history of recurrent episodes of pancreatitis and cholecystectomy...
presented with complaints of severe, sharp, and constant abdominal pain in the left upper quadrant (LUQ) and flank with radiation to the left lower quadrant (LLQ). The pain was associated with subjective fever, nausea, and nonbloody emesis and was exacerbated by oral intake. The patient denied additional gastrointestinal or genitourinary disturbances, sick contacts, travel, or consumption of unusual food.

Two months prior to presentation, she had an episode of pancreatitis complicated by pseudocyst formation along the greater curvature of the stomach, measuring $13 \times 9.5 \times 5.5$ cm. She underwent ultrasound-guided drainage of approximately 100 mL of cloudy fluid with subsequent placement of a 12-French pigtail catheter. External bag drainage was continued for 2 weeks and removed once the drainage was minimal.

One day after catheter removal, the patient developed progressive abdominal discomfort, which prompted repeat evaluation. Laboratory studies were only significant for an alkaline urine pH of 8.0. A computed tomography (CT) scan of the abdomen revealed a cystic structure with fistulous extension below the pancreas into the left para-aortic space. The reading further commented on the presence of mild left hydronephrosis due to the passage of the ureter near a cluster of lymph nodes and cystic structures from the fistula below the pancreatic tail measuring $2.2 \times 3.9 \times 4.5$ cm [Figure 1].

Magnetic resonance cholangiopancreatography (MRCP) was obtained to further evaluate the pancreatobiliary anatomy. It demonstrated an abnormal pancreatic duct in the body and tail of the pancreas with a complex multiloculated pseudocyst extending anteriorly into the lesser sac, posteriorly and medially to the level of the left kidney with possible ureteral fistula formation, and mild left-sided hydronephrosis [Figures 2 and 3]. An additional smaller fistula was noted to extend medially from the pseudocyst into a soft-tissue mass.

In an effort to optimize pancreatic drainage, a sphincterotomy was performed with pancreatic stent placement during an endoscopic retrograde cholangiopancreatography (ERCP). Additionally, a left retrograde pyelogram was performed to evaluate the level/degree of ureteral obstruction and further assess for the presence of a fistulous tract. A fistulous tract was in fact visualized between the left renal pelvis (at the level of an upper pole calyx) and the pancreatic duct and a ureteral stent was placed to facilitate fistula closure [Figure 4]. The patient was started on imipenem/cilastatin prophylaxis pending blood and pancreatic pseudocyst fluid cultures, which ultimately returned culture negative.
pancreatic and ureteral stents. In an effort to relieve compression of the stomach by the pseudocyst and to facilitate eating, she underwent a successful pancreatic cyst gastrostomy. Following the procedure, the patient attained symptomatic relief and oral intake was successfully resumed. A left retrograde pyelogram was repeated after 2 months demonstrating no evidence of a residual fistulous tract [Figure 5].

Discussion

Pancreaticoureretal fistulae (PUF) are exceedingly rare. Upon reviewing the literature only two case reports were identified.[5,6] However, unlike our case, those fistulae evolved following traumatic injury to the ureter or pancreatic duct. No reports were found to describe PUF as a complication of chronic pancreatitis. In trauma related cases, pancreatic fistula most likely form secondary to persistent leakage of pancreatic secretions from a disrupted pancreatic duct. This may lead to persistent inflammation and result in erosion into surrounding structures. Many etiologies, including pancreatitis, trauma, biopsy, or surgery, can result in pancreatic duct disruption.[1,7,8] One proposed etiology for the evolution of a PUF in our patient may involve recurrent inflammatory infiltrate progressively eroding surrounding structures and intimately extending into the retroperitoneal space.

Multiple modalities are available to diagnose pancreatic fistula. ERCP, MRCP, CT scan, and fistulography are often the main imaging studies implemented. ERCP was found to be 100% sensitive and specific in the diagnosis of pancreatic ductal rupture in one prospectively study and was superior to CT scan[9,10] and MRCP, which are reported to detect pancreatic duct abnormalities with similar accuracy.[11] In addition to the common complications of pancreatic fistulae, complications specific for PUF can include metabolic abnormalities (hyperchloremic metabolic acidosis, electrolytes imbalance), urological complications (chemical cystitis, urethritis, hematuria, urinary tract infection, and bladder stones), and reflux pancreatitis.[12-16] Metabolic complications are due to a loss of alkaline exocrine pancreatic secretions in the urine while pancreatic enzymes secreted in the urine may cause urological complications.

Up to 50% of internal pancreatic fistulas and 70% to 90% of external pancreatic fistulas may heal with conservative measures.[17] For patients presenting with a main pancreatic duct dilatation, without ductal disruption or stricture, conservative therapy (broad spectrum antibiotics, enteral nutrition, and correction of fluid and electrolyte imbalances) should be pursued.[18] Of note, enteral nutrition is associated with significantly higher closure rates and shorter time to closure, than parenteral nutrition.[19] Additionally, somatostatin analog administration is reported to promote pancreatic fistula closure by decreasing the volume of fistulous tract output.[20-22]

If conservative measures fail or if the fistula becomes complicated by infection or bleeding, endoscopic or surgical interventions are warranted.[1] ERCP is a safe and effective modality and can be considered the first-line therapy in the management of pancreatic fistulae. Early ERCP and pancreatic stent insertion promote fistula resolution and may allow delay or avoidance of surgical measures.[23-27] Due to their significant complication profile, surgical interventions should be reserved for cases not responsive to conservative measures.
Conclusion

Pancreatic fistula formation is a rare complication of pancreatitis. PUF, in particular, is an exceedingly unusual manifestation of a pancreatic fistula. A number of imaging modalities, such as ERCP, MRCP, CT scan, or fistulography, can assist in the diagnosis of PUF. Nonoperative modalities, including medical and endoscopic measures, may initially be pursued for the management of PUF. Failure of these conservative approaches may warrant pursuit of surgical measures.

Due to PUF’s unclear etiology and possible variance of presentation, it is important for physicians to keep this rare complication of pancreatitis in mind while evaluating patients with recurrent pancreatitis, urinary symptoms, and/or imaging suggestive of abnormalities within the urinary collecting system and pancreas.

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Conflicts of interest
There are no conflicts of interest.

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