Pancreaticopleural Fistula: Diagnosis and Management of Three Cases

INTRODUCTION
Pancreaticopleural fistulas are uncommon complications of pancreatitis that occur when there is a disruption in the pancreatic duct, causing pancreatic fluid to track through the retroperitoneum and into the pleural cavities. Treatment of pancreaticopleural fistulas can include conservative medical therapy, ERCP intervention using pancreatic duct stent, and operative therapy which should be considered a last resort if all prior therapies fail. This manuscript serves to highlight why ERCP with pancreatic duct stenting should be considered first line therapy when treating a pancreaticopleural fistula.

CASE REPORT
Case #1
A 46-year-old male with a history of alcohol induced chronic pancreatitis and recurrent pleural effusions presented to the emergency department with severe septicemia, shortness of breath, chest pain and abdominal pain. On chest x-ray, patient was found to have a right-sided large pleural effusion and pleural empyema. Thoracentesis was performed, and the pleural fluid had high amylase level of 10,000 U/dL and the empyema was positive for Actinomycetes. In addition to chest drainage, the patient was referred for pancreatic duct stenting via ERCP to reduce the intraductal pressure and divert pancreatic secretions away from the fistulous tract. The ERCP showed dye extravasation at the level of the pancreatic tail. (Figure 1) Ventral pancreatic

(continued on page 78)
Discussion

Pancreaticopleural fistulas are a rare and severe manifestation of pancreatitis. They are most commonly associated with alcohol-induced acute or chronic pancreatitis but can be associated with trauma or iatrogenic injury, among other causes. The pathophysiology of a pancreatic fistula results from underlying inflammation that disrupts the pancreatic duct resulting in the formation of an alternative drainage pathway where pancreatic secretions, containing digestive enzymes and bicarbonate, take the path of least resistance.

If the disruption in the pancreatic duct tracks anteriorly, a pancreaticoperitoneal fistula can communicate freely with the peritoneal cavity, manifesting as pancreatic ascites. If the disruption occurs posteriorly, these fistulous tracts can dissect through the retroperitoneum and into the pleural cavity. Such communications can result in left or right pleural effusions that can require management and can be acute, subacute, or chronic.

There are substantial mortality risks associated with the development of a pancreaticopleural fistula. While patients can experience severe electrolyte losses related to loss of sodium and bicarbonate in pancreatic secretions, most deaths are attributable to sepsis or hemorrhage.

Patients with pancreaticopleural fistulas often present with chest pain, shortness of breath, respiratory distress and cough. Simultaneous pancreatic ascites is present in 20% of reported
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than 17 weeks were associated with a substantial increased risk of septic complications such as pleural empyema. Definitive interventional therapy is preferable in most cases.

ERCP is performed to decompress the pancreatic duct and reduce the ductal pressure. A pancreatic stent is commonly placed to divert pancreatic secretions away from the fistulous tract and out through the pancreatic duct to the duodenal lumen. Operative management may rarely be needed if other conservative therapies fail to close the fistulous tract or if the patient has high grade strictures, a disconnected pancreatic duct, or in the event of an unsuccessful ERCP. Morbidity and mortality rates must be weighed against potential complications of operative treatment. Early operative intervention of distal pancreatectomy with or without splenectomy after failed endoscopic management is associated with fewer septic complications, but represents maximally invasive therapy.

In a review reported by Altasan et al. 5%-15% of patients with acute pancreatitis will develop complications including pseudocyst, necrosis, or pancreaticopleural fistula. Pleural effusion was noted in 3%-17% of cases and was associated with a worse prognosis. The development of a fistulous tract is associated with pseudocyst formation in 77% of cases. Patient age of presentation ranged from 20-60 years in 95% of the reported cases. In a literature review reported by Ali et al. 52 cases of...
Pancreaticopleural fistulas were reported. Patients presented with dyspnea in 65% of cases, abdominal pain in (29%) cough (27%) and chest pain (23%). ERCP diagnosed fistulous tracts in 25 (78%) of 32 patients, CT scan was used to diagnose the pancreaticopleural fistula in 8 of 17 patients, and magnetic resonance cholangiopancreatography was used for diagnosis in 8 of 10 patients. Medical therapy was successful in as a primary intervention in 61% of the cases. ERCP with pancreatic duct stent placement was performed without first giving Octreotide intervention in 13 (25%) cases as initial therapy and surgical intervention as primary treatment was performed in 13% of cases. Conservative medical therapy failed in 65% of the cases but resolved with ERCP and surgical intervention.19

Medical therapy alone including drainage of chest fluid carries high failure rates and greatly increases the patient’s chances of needing more aggressive definitive intervention.20 While ERCP is more invasive than conservative medical treatment alone, it carries significantly fewer risks than operative therapy. During ERCP, pancreatic duct stents can be placed to bridge the ductal disruption (if possible) or simply be placed in a transampullary manner thereby diverting pancreatic secretions away from the fistulous tract and out to the duodenum. All of these effects help facilitate fistula healing.21 Most fistula tracts develop in the head or body of the pancreas where bridging with a pancreatic stent is accessible.6 If the fistulous tract is present in the tail of the pancreas, the pancreatic duct stent should be placed as close to the ductal disruption as possible if bridging across the disruption cannot be accomplished. In a study reported by Pai et al., 28 patients who presented with PPF, 92.8% of patients had complete resolution of pancreatic ascites or pleural effusion after they underwent endoscopic extraction with pancreatic sphincterotomy. Therapeutic interventions consisted of a 5mm sphincterotomy and placement of a 7 Fr pancreatic stent.22 A high percentage of pancreatic stents occlude within 3 months of placement some authors suggest placing pancreatic duct stent in addition to performing a sphincterotomy, although it must be said that individual techniques vary and there are no strict guidelines for this situation.23-24 Pai et al. were unable to conclude if sphincterotomy performed as a single intervention without subsequent pancreatic duct stenting was successful in resolution of the fistula. 20 Neher et al. reported successful treatment of a pancreaticopleural fistula with placement of a 7F nasopancreatic drain after the fistulous tract persisted following 7F stent placement. Nasopancreatic drains allow for repeated panreatograms without further procedures, although in practice they are rarely employed given the high level of patient inconvenience they create.25 Conservative medical therapy alone was previously only continued for 2 to 4 weeks. Due to the high success rate of conservative medical

(continued on page 82)
therapy combined with ERCP intervention, conservative management can be continued up to 2.5 to 6 months.19

In summary, pancreaticopleural fistulas resulting in pleural effusions are rare complications of pancreatitis. Pleural effusion with a history of alcohol use and/or pancreatitis should raise clinical suspicion for presence of a pancreaticopleural fistula. Nonoperative treatments are often successful in resolution of fistulous tracts, mostly via endoscopic means. ERCP and pancreatic duct stent placement with or without sphincterotomy should be considered first line therapy when approaching treatment of such fistulas.

References