ABSTRACT

Pancreatico-pleural fistula-A rare sequelae of pancreatitis

INTRODUCTION: Pancreaticopleural fistula is an uncommon complication of pancreatitis, presenting both diagnostic and therapeutic challenges. The following case report highlights the distinctive difficulties associated with pancreaticopleural fistula. The objective is to provide valuable insights to the scientific literature by detailing the case of a middle-aged gentleman suffering from sequelae of acute pancreatitis and left sided pleural effusion.

MATERIALS AND METHOD: A 41-year-old gentleman with a history of acute pancreatitis and chronic alcohol use presented with breathlessness, fever, chest pain, and abdominal pain. Computed tomography showed a pseudocyst involving the tail of pancreas & Spleen, a large left-sided pleural effusion and a moderate right-sided pleural effusion, along with signs of pneumonitis. Analysis of the pleural fluid from left pleural cavity revealed markedly elevated levels of Amylase. A MRCP (Abbrev) confirmed the findings & suggested a pancreaticopleural fistula.

RESULTS: Following a multidisciplinary consensus, an intercostal drainage tube was inserted into the left pleural cavity preoperatively. He was started on Octreotide therapy, and underwent nutritional & pulmonary optimization for elective surgery. He underwent a distal pancreato-splenectomy. Postoperative period was uneventful. He is doing well on 6 months of follow up.

CONCLUSION: The management of pancreaticopleural fistula demands a comprehensive and individualized approach. Recognition guided by high clinical suspicion coupled with appropriate investigations and a careful balance between medical and surgical interventions is crucial for achieving favorable outcomes. This case report adds to the scientific literature by providing insights into the complexities of sequelae of pancreatitis and emphasizes the importance of individualized strategies in their management.

Key points

1.Pancreatico pleural fistula being rare complication of pancreatitis

2. Clinical features mimics signs of breathlessness and fever which may cause delay in accurate diagnosis and their appropriate management

Key words
Pancreatitis, pancreatico pleural fistula, pleural effusion breathlessness psuedocyst

INTRODUCTION

- Pancreaticopleural fistula has been recognized as a clinical entity since case reports were published in late 1960s [1]. Since that time, pancreaticopleural fistulae and pancreatic ascites have been termed as internal pancreatic fistulae which share common pathogenesis which includes the disruption of main pancreatic duct, resulting in leakage of pancreatic fluid [2–6]. This rare entity may be seen in patients with acute and chronic pancreatitis or may follow traumatic and surgical disruption of the pancreatic duct [2–6]. Pancreaticopleural fistula is a rare complication of chronic pancreatitis consequent to posterior disruption of the pancreatic duct. The fistulous track ascends into the pleural cavity and gives rise to large volumes of pleural fluid. To further complicate the matter, abdominal pain is seldom the presenting or significant feature.It is characterized by massive pleural fluid and has a tendency to recur following treatment. While conservative management with pancreatic duct stenting and inhibition of pancreatic secretion with octreotide may achieve closure of fistula in 31 to 45% of cases, surgery leads to healing in 80 to 90% of cases but carries a mortality up to 10% [2–6].

  Pleural effusion resulting from a pancreaticopleural fistula is exceptionally rare, occurring in less than 1% of cases [7]. It is observed in

approximately 3% to 7% of patients with pancreatitis [8]. The combined incidence of internal pancreatic fistulae—which includes both pancreatic ascites and pancreaticopleural fistulae—ranges from 0.4% to 7% in individuals with chronic pancreatitis, and from 6% to 14% in those with pancreatic pseudocysts Among these, pancreaticopleural fistulae are less common than pancreatic ascites. Clinically, they often manifest as large, recurrent pleural effusions, typically affecting one side of the chest, with the left side being more frequently involved—reported in about 76% of cases.

Pancreaticopleural fistula typically arises from a leak associated with a partially formed or ruptured pancreatic pseudocyst, though in a smaller subset of cases, it results from a direct leak of the pancreatic duct . The fistulous tract may traverse the diaphragm via the aortic or esophageal hiatus or penetrate directly through the diaphragm. The underlying pathophysiology and etiology are similar for both pancreatic ascites and pancreatic pleural effusion. When the disruption of the pancreatic duct occurs anteriorly without being contained, it can lead to the formation of a pancreaticoperitoneal fistula, manifesting as ascites . Conversely, if the ductal disruption occurs posteriorly, pancreatic secretions may track into the retroperitoneum and ascend through the aortic or esophageal hiatus into the mediastinum. This can result in a pleural fistula directly or through the formation of a mediastinal pseudocyst, which may subsequently rupture into the pleural cavity, establishing a pleural fistula.

Pancreaticopleural fistula most commonly occurs in middle-aged men between the ages of 40 and 50, particularly those with a history of chronic alcohol use and pancreatitis. However, approximately 50% of affected individuals do not have a documented history of pancreatitis. Trauma is a much less frequent cause, accounting for only about 0.5% of cases. Pancreatic pseudocysts are present in 69% to 77% of patients who develop a pancreaticopleural fistula.

The clinical presentation can be misleading, as symptoms are typically related to a large pleural effusion. Common complaints include dyspnea, cough, chest pain, fever, and occasionally sepsis. Pulmonary symptoms are more prominent than abdominal ones and are often the initial presenting features, with dyspnea being the most frequently reported symptom. Classic abdominal pain associated with acute pancreatitis is rarely reported. On average, symptoms persist for about 5.6 weeks before diagnosis.

Pleural effusion are predominately left sided; however, right-sided and bilateral effusion occurs in 19% and 14% of patient's, respectively. Pleural effusion of this nature tends to be large and recurrent despite repeated thoracocentesis. Many patients go through extensive pulmonary evaluation before pancreas is identified as the site of primary pathology. The pleural effusion is associated with ascites in 20% and pericarditis in 4% [9].

CASE REPORT

- A 41-year-old male farmer presented to our hospital with a 2-week history of progressively worsening shortness of breath, a dry cough, and leftt-sided chest pain. He denied experiencing recent abdominal pain, distension, nausea, or vomiting. The patient reported having undergone two thoracocentesis procedures for left-sided pleural effusion at an outside facility over the past four months, which provided symptomatic relief.
- On physical examination, decreased breath sounds and dullness to percussion were noted on the left side of the chest, indicating the presence of a pleural effusion. On admission, his vital signs were: temperature 38.0°C, blood pressure 130/80 mmHg, pulse rate 95 bpm, respiratory

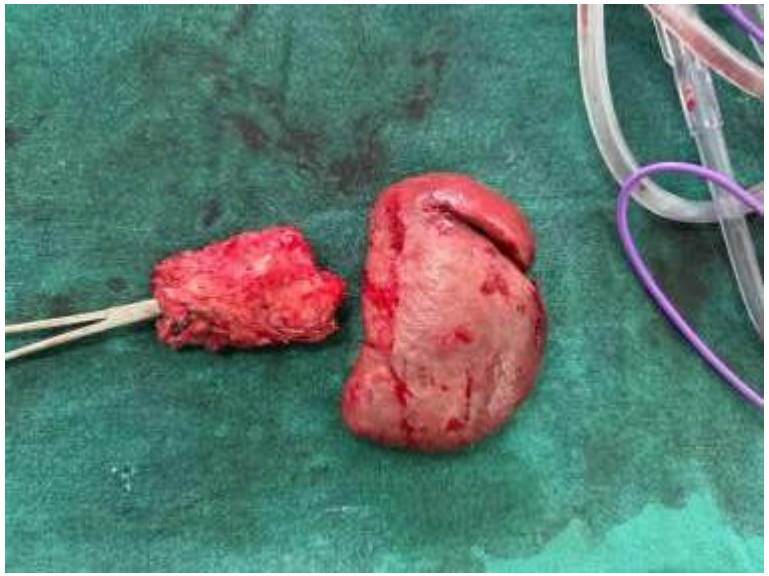
rate 22 breaths per minute, and oxygen saturation of 92% on room air. The patient was tachypneic. He has history of smoking He had a history of regular alcohol consumption (approximately 120 ml twice weekly for 20 years), which he discontinued 2 months prior to presentation. Six months ago, he experienced an acute episode of abdominal pain and was diagnosed with pancreatitis, which was managed conservatively.

- Computed tomography showed a pseudocyst involving the tail of pancreas & Spleen, a large left-sided pleural effusion along with signs of pneumonitis.
- Analysis of the pleural fluid from left pleural cavity following insertion of a intercostal drainage tube revealed markedly elevated levels of Amylase. A Magnetic Resonance Cholangio-Pancreaticography confirmed the findings & suggested a Left sided pancreaticopleural fistula

MANAGEMENT

Initial treatment focused on symptomatic relief and reduction of pancreatic secretions. An intercostal chest tube drainage was placed in the right pleural cavity to alleviate the pleural effusion. Octreotide injection was administered to inhibit pancreatic secretions after the cause of pleural effusion was attributed to PPF. The patient was provided total parenteral nutrition (TPN) to allow the pancreas to rest. A pancreatic duct stent was placed on ERCP to promote fistula closure . In addition to these interventions, the patient was given prophylactic antibiotic cover to prevent secondary infections.

- Following a multidisciplinary consensus underwent nutritional & pulmonary optimization for elective surgery. He underwent a distal pancreatosplenectomy because of large number of collaterals which had developed between the tail of pancreas and the spleen
- Postoperative period was uneventful. He is doing well on 6 months of followup.



DISCUSSION

Pleural fistulas develop due to abnormal communication of the pleural space with various structures in its vicinity, often due to iatrogenic causes, malignancy, or necrotizing infective processes(10). The different forms of pleural fistula include relatively common bronchopleural fistula, esophagopleural fistula and gastro pleural fistula, uncommon pancreaticopleural fistula, and hepatopleural fistula, and rarely encountered duropleural (subarachnoid-pleural) and nephropleural fistulas. Pleural space has negative pressure and deep recesses with large areas of surface contact with various structures, making it vulnerable to fistula formation. Pancreaticopleural fistulas (PPF) are uncommon and are usually linked to pancreatic trauma, pancreatitis, pancreatic surgery (such as pancreaticoduodenectomy), or ruptured pancreatic pseudocysts (11). Most patients with PPF are middle-aged men, typically between 40 and 50 years old, with a history of chronic alcohol consumption and pancreatitis. PPF is usually seen in patients with necrotizing and recurrent pancreatitis; however, PPF may have insidious development in cases of pancreatitis with persistent inflammation. The fistulous tract may pass directly through the diaphragm—though this is uncommon—or through diaphragmatic openings such as the aortic or esophageal hiatus . Anterior disruption of the pancreatic duct (PD), when uncontained, typically results in a pancreaticoperitoneal fistula, often presenting as ascites . In contrast, posterior PD disruption can allow pancreatic secretions to spread into the retroperitoneal space, potentially reaching the mediastinum via the esophageal or aortic hiatus and leading to a pancreaticopleural fistula (PPF) . Another possible pathway involves the formation of a mediastinal pseudocyst that eventually ruptures into the pleural cavity, creating a PPF(12). Serum amylase and lipase levels are also often elevated in patients with pancreatic pseudocysts, as was seen in our case. Serum amylase and lipase levels are also often elevated in patients with pancreatic pseudocysts, as was seen in our case. Clinical signs linked to a recurrent large pleural effusion typically include

dyspnea, cough, fever, chest discomfort, and septicemia . Dyspnea is the most common presentation of pleuropulmonary symptoms in PPF, which are more common than abdominal symptoms. Patients rarely report the characteristic abdominal pain associated with pancreatitis, and many patients undergo an extensive pulmonary evaluation with delayed diagnosis of PPF.A plain chest radiograph is typically the first diagnostic tool used to identify pleural effusion, which may appear unilaterally—most often on the left—or bilaterally. Thoracocentesis is performed to relieve symptoms and to obtain pleural fluid for analysis. In cases of pancreaticopleural fistula (PPF), pancreatic enzymes leak into the pleural space, resulting in pleural effusions rich in amylase and lipase, with pleural fluid amylase levels often exceeding 1,000 U/L . Elevated pleural fluid amylase can also be seen in other conditions, such as acute pancreatitis, gastropleural and esophagopleural fistulas, pulmonary tuberculosis, liver cirrhosis, and certain malignancies . However, markedly elevated amylase levels—above 10,000 U/L—are more characteristic of PPF or ruptured pancreatic pseudocysts, with levels surpassing 50,000 U/L typically indicating PPF (12). In the current case, persistent and rapid re-accumulation of pleural fluid—despite 2 previous thoracocentesis draining over a liter each time—prompted further investigation into rarer causes. The markedly elevated pleural fluid amylase and lipase levels were critical diagnostic clues pointing toward a pancreatic origin. The management of PPF typically involves a combination of medical, endoscopic, and sometimes surgical interventions. Initial treatment includes chest tube drainage of the pleural effusion, octreotide administration to reduce pancreatic secretions, and nutritional support through total parenteral nutrition (TPN) to rest the pancreas. Surgical management is curative, with a success rate of up to 90%, and is typically done in patients who fail to respond to conservative treatment.

CONCLUSION

- This case highlights the necessity of considering pancreaticopleural fistula (PPF) in the differential diagnosis of recurrent pleural effusion, particularly in patients with a history of pancreatic disease or relevant risk factors. Early diagnosis and appropriate therapeutic intervention are crucial for improving clinical outcomes.

- The management of pancreaticopleural fistula demands a comprehensive and individualized approach. Recognition guided by high clinical suspicion coupled with appropriate investigations and a careful balance between medical and surgical interventions is crucial for achieving favorable outcomes.
- This case report adds to the scientific literature by providing insights into the complexities of sequelae of pancreatitis and emphasizes the importance of individualized strategies in their management. It also emphasizes the essential role of advanced imaging and endoscopic techniques in the accurate diagnosis and effective management of this uncommon but significant clinical entity

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