RESEARCH PAPER

Recurrent Left Pleural Effusion Unveiling Pancreaticopleural Fistula

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ABSTRACT

Pancreaticopleural fistula (PPF) is a rare complication of chronic pancreatitis, often presenting with predominant respiratory symptoms that can obscure the underlying pancreatic pathology. This case report details a patient 52 year old male present with complaints of epigastric region pain and breathlessness with recurrent left-sided pleural effusion, in whom the diagnosis of PPF was established through a combination of contrast-enhanced computed tomography and pleural fluid analysis. Imaging revealed chronic pancreatitis with peripancreatic fluid collections and a fistulous communication extending from the pancreatic tail to the subdiaphragmatic region, with subsequent spread into the left pleural cavity. The pleural fluid demonstrated a markedly elevated amylase level, confirming its pancreatic origin. The patient underwent CT-guided pigtail catheter drainage of the effusion. This case highlights the critical diagnostic challenge posed by PPF when it manifests with atypical respiratory symptoms and underscores the need for a high index of suspicion in patients with unexplained recurrent pleural effusion. A timely diagnosis, facilitated by appropriate imaging and pleural fluid analysis, is essential to initiate effective treatment, reduce morbidity, and prevent long-term respiratory compromise.

Keywords: Pancreaticopleural fistula, Chronic pancreatitis, Recurrent pleural effusion, Contrast-enhanced CT, Pleural fluid amylase

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Introduction

Pancreaticopleural fistula (PPF) is an uncommon yet serious complication of pancreatitis, arising from a pathological communication between the pancreatic ductal system and the pleural cavity. The reported incidence of PPF in patients with pancreatic disease is approximately 0.4%, and it constitutes less than 1% of all pleural effusions. The condition is most frequently associated with chronic alcohol-induced pancreatitis, where repeated episodes of inflammation and ductal disruption lead to the formation of pseudocysts that may erode through surrounding structures, including the diaphragm.

A key clinical challenge in diagnosing PPF is its atypical presentation. Unlike classic pancreatitis, which is characterized by epigastric pain, patients with PPF often present with respiratory symptoms such as dyspnea, pleuritic chest pain, or a persistent cough. As a result, the underlying pancreatic etiology may be overlooked, leading to diagnostic delays and repeated hospitalizations for recurrent pleural effusions of unclear cause.

The diagnosis of PPF is based on a combination of imaging findings and pleural fluid analysis. High-resolution imaging, including contrast-enhanced computed tomography (CT) and magnetic resonance cholangiopancreatography (MRCP), can reveal pancreatic ductal dilation, pseudocyst formation, and the fistulous tract itself. However, pleural fluid analysis is confirmatory; the presence of an exudative effusion

with a markedly elevated amylase level (often exceeding several thousand units per liter) is pathognomonic for a pancreatic source. The management of PPF ranges from conservative measures, such as bowel rest, total parenteral nutrition (TPN), and somatostatin analogs, to endoscopic intervention with pancreatic duct stenting, and in refractory cases, surgical repair or pancreatic resection. This case report presents a patient with recurrent left pleural effusion that was ultimately attributed to a pancreaticopleural fistula. It serves to reinforce the importance of clinical suspicion for PPF in patients with unexplained pleural effusion and a history of chronic pancreatitis, highlighting the diagnostic role of imaging and pleural fluid biochemistry.

Case Presentation

A 52 year male who presented with complaints of epigastric region pain and breathlessness presented with recurrent left pleural effusion of unclear aetiology. The patient's clinical history was significant for chronic pancreatitis, as evidenced by imaging findings. A plain CT scan of the abdomen (axial and coronal sections) revealed several characteristic features of chronic pancreatic disease. The uncinate process of the pancreas showed a few specks of calcification, a common finding in chronic pancreatitis. More importantly, the distal body and tail of the pancreas were bulky, measuring approximately 3.0 cm and 3.2 cm, respectively, with surrounding fat stranding indicative of ongoing inflammation (Fig. 1a and 1b).

The CT scan also identified two distinct hypodense collections. The first was a subdiaphragmatic collection measuring approximately 6.5 x 4.8 x 3.5 cm, also associated with fat stranding. The second was a perigastric collection measuring about 3.6 x 3.3 x 3.1 cm, similarly accompanied by inflammatory changes. A left pleural effusion was noted concurrently (Fig. 1a and 1b).

Further imaging with contrast-enhanced CT (Fig. 2a and 2b) provided more detailed anatomical information. A hypodense collection measuring 1.3 x 1.5 cm was identified in the tail of the pancreas. This collection was seen traversing along the greater curvature of the stomach and communicating directly with the subdiaphragmatic collection. Additionally, a well-defined hypodense collection with an enhancing wall was noted in the left subdiaphragmatic region. This collection measured 8.7 x 6.2 x 4.2 cm with a volume of approximately 117.0 mL. Crucially, a suspicious fistulous communication was observed between this subdiaphragmatic collection and the left pleural cavity, confirming the diagnosis of a pancreaticopleural fistula (Fig. 2a and 2b).

To manage the significant pleural effusion, a CT-guided pleural tapping procedure was performed (Fig. 3). A preliminary axial CT scan of the thorax was used to localize the pleural collection and plan a safe access route. Under strict aseptic precautions and local anesthesia, a percutaneous approach was chosen along the posterolateral chest wall. A needle was advanced into the pleural space under intermittent CT guidance, carefully avoiding the adjacent lung parenchyma and vascular structures. Following confirmation of correct intrapleural needle position by aspiration of fluid, a guidewire was introduced using the Seldinger technique. The tract was serially dilated, and a pigtail catheter was inserted into the pleural cavity. The catheter tip was seen coiled within the pleural space on CT, confirming correct positioning, and the catheter was then connected to an underwater seal drainage system (Fig. 3).

Analysis of the pleural fluid revealed a yellowish, non-purulent appearance (Fig. 4). Biochemical analysis showed a significantly elevated amylase level, positive for pancreatic enzymes, confirming the pancreatic origin of the pleural effusion (Fig. 4).

Discussion

This case exemplifies the diagnostic challenge that pancreaticopleural fistula presents, as the clinical picture is dominated by respiratory symptoms rather than the typical abdominal pain of pancreatitis. In many reported cases, patients with PPF may not have a history of a recent acute attack of pancreatitis, and the abdominal component can be subtle or even absent, further obscuring the diagnosis. Consequently, a high index of suspicion is essential in any patient with a history of chronic pancreatitis or alcohol use disorder who presents with a recurrent or unexplained pleural effusion, especially if it is large, recurrent, and predominantly left-sided.

Imaging plays a pivotal role in both the diagnosis and management of PPF. While chest X-ray may reveal a pleural effusion, contrast-enhanced CT of the abdomen and chest is the initial modality of choice for identifying pancreatic ductal abnormalities, pseudocysts, peripancreatic inflammation, and the fistulous tract. In the present case, CT imaging was instrumental in demonstrating the bulky distal pancreas with peripancreatic fluid collections and, crucially, the communication between the tail of the pancreas and the left subdiaphragmatic region, as well as the fistulous connection to the pleural cavity. When CT findings are equivocal, MRCP can provide superior visualization of

the pancreatic ductal anatomy and may better delineate the fistulous tract. Endoscopic retrograde cholangiopancreatography (ERCP) remains the gold standard for definitive diagnosis and is also therapeutic, as it allows for pancreatic sphincterotomy and stent placement across the ductal disruption.

Pleural fluid analysis is confirmatory. An exudative effusion with a very high amylase level is pathognomonic for a pancreatic source. Amylase levels are typically markedly elevated, often exceeding 1,450 U/L, and are usually several times higher than the corresponding serum amylase level. In the reported case, the pleural fluid was exudative, non-purulent, and revealed a significantly elevated amylase level, consistent with the diagnosis.

The management of PPF has evolved significantly, with a shift towards minimally invasive endoscopic techniques as first-line therapy. Conservative medical management includes bowel rest, TPN to reduce pancreatic stimulation, administration of somatostatin analogs (e.g., octreotide) to suppress pancreatic enzyme secretion, and therapeutic thoracentesis or chest tube drainage of the pleural effusion. This approach may be successful in a proportion of patients, particularly when the ductal disruption is partial or the fistula is small. However, in cases of persistent or recurrent effusion, endoscopic intervention is indicated. ERCP with pancreatic duct stenting has been shown to be successful in approximately 70-82% of patients, by diverting pancreatic juice away from the site of ductal disruption. For patients who fail medical and endoscopic management, or who have complete ductal disruption in the pancreatic tail, surgical options such as distal pancreatectomy, pancreaticojejunostomy, or fistula repair may be necessary, with success rates as high as 94%.

The prognostic implications of PPF are generally favorable if the diagnosis is made promptly and appropriate treatment is instituted. Delayed diagnosis can lead to significant morbidity, including respiratory compromise, recurrent pleural infections, empyema, and the development of a persistent pancreaticopleural fistula. Therefore, a multidisciplinary approach involving gastroenterologists, interventional radiologists, pulmonologists, and pancreatic surgeons is essential to optimize patient outcomes.

Conclusion

Pancreaticopleural fistula should be considered in the differential diagnosis of any patient with a history of chronic pancreatitis who presents with a recurrent, unexplained pleural effusion. The diagnosis requires a high index of suspicion, as respiratory symptoms often overshadow abdominal complaints. Contrast-enhanced CT is a key imaging modality for identifying pancreatic pathology and the fistulous tract, while pleural fluid analysis demonstrating a markedly elevated amylase level is confirmatory. Early recognition and a multidisciplinary management strategy, often involving endoscopic intervention with pancreatic duct stenting, are crucial for achieving favorable outcomes and preventing long-term complications. This case underscores the importance of considering an abdominal source in patients with recurrent pleural effusion of unclear etiology.

Figures and Figure Legends

Fig. 1a and 1b: Plain CT abdomen (axial and coronal sections) showing chronic pancreatitis with specks of calcification in the uncinate process. The distal body and tail of the pancreas are bulky with surrounding fat stranding. Hypodense collections are seen in the subdiaphragmatic and perigastric regions, and a left pleural effusion is noted.

Fig. 2a and 2b: Contrast-enhanced CT images demonstrating a hypodense collection in the tail of pancreas that traverses along the greater curvature of the stomach and communicates with a large subdiaphragmatic collection. A well-defined hypodense collection with an enhancing wall is seen in the left subdiaphragmatic region, with a suspicious fistulous communication extending into the left pleural cavity.

Fig. 3: CT-guided pleural tapping procedure. A pigtail catheter is seen coiled within the left pleural space, positioned under CT guidance, and connected to an underwater seal drainage system.

Fig. 4: Pleural fluid analysis. The fluid is yellowish and non-purulent. Biochemical analysis shows a markedly elevated amylase level, confirming its pancreatic origin.

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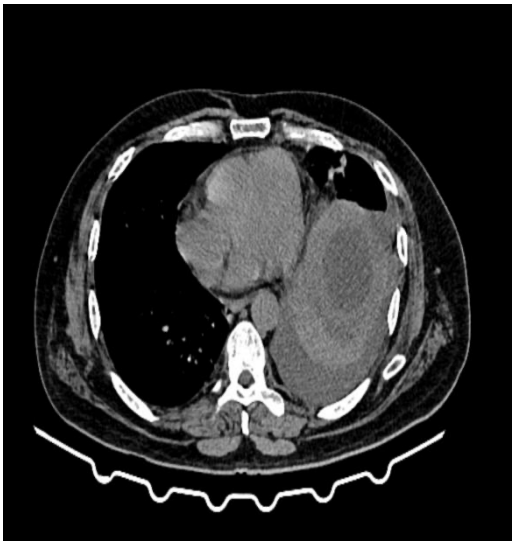
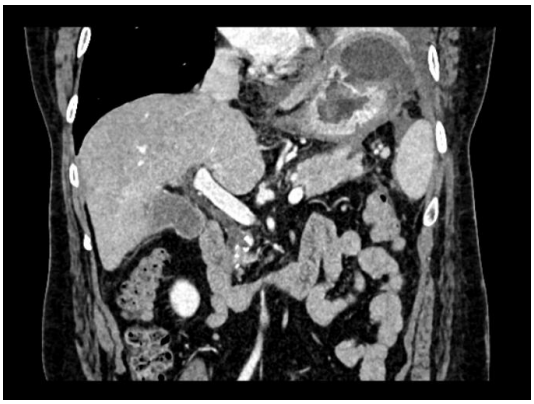


Figure 1a and 1b



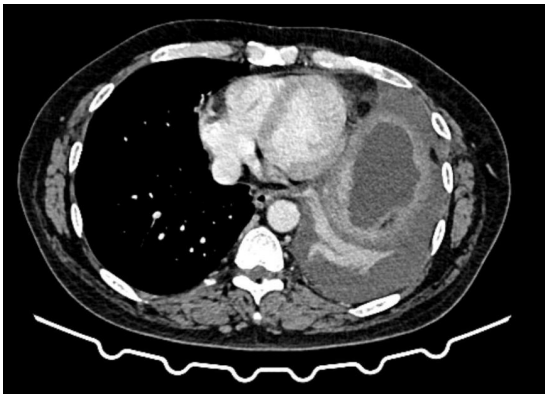


Figure 2a and 2b

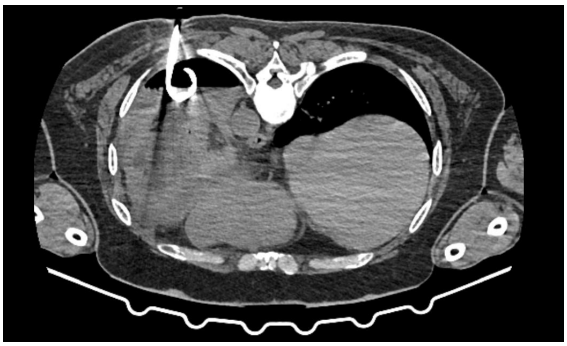


Figure 3: Ct guided pleural tapping:

Figure 4