

## CASE REPORT

# Pancreaticopleural Fistula: An Unusual Complication of Pancreatitis Diagnosed with Magnetic Resonance Cholangiopancreatography

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### ABSTRACT

**Context** Pancreaticopleural fistula is a rare complication of pancreatitis. Pleural effusion resulting from a pancreaticopleural fistula is extremely rare and accounts for less than 1% of cases. Due to non-specific clinical presentations of a pancreaticopleural fistula, imaging plays an important role. Magnetic resonance cholangiopancreatography (MRCP) is very useful in depicting parenchymal and ductal structural changes along with direct visualization of a pancreaticopleural fistula. **Case report** We present the case of a middle-aged male with moderate right pleural effusion who had a history of pancreatitis. MRCP showed chronic pancreatitis with a pancreaticopleural fistula. A brief review of the role of imaging in a pancreaticopleural fistula is discussed along with the case. **Conclusion** MRCP is a useful modality for diagnosing a pancreaticopleural fistula.

### INTRODUCTION

Pleural effusion associated with pancreatitis is usually sympathetic and inflammatory in nature. It is seen in approximately 3-17% of cases of pancreatitis and also changes the grading as well as the treatment options [1]. These effusions usually diminish uneventfully with the treatment of pancreatitis. Pleural effusion is uncommon in chronic pancreatitis and can occur as a consequence of a fistula [1]. These fistulous tracts result from communication between the pancreas and the pleural space or by the direct extension of a pseudocyst through the mediastinum. A pancreaticopleural fistula is a rare complication of pancreatitis with the reported incidence said to be only 0.4-4.5% [2].

### CASE REPORT

A 53-year-old male presented with shortness of breath, low grade fever, intermittent hemoptysis and chest pain of 4 months duration. He had been on category II ATT (antitubercular therapy) for the previous 5 months. He had had a history of pancreatitis 9 years previously for

which he had undergone an open laparotomy and drainage of a peripancreatic pseudocyst. On chest examination, there was dull note on percussion on right side of the chest with decreased air entry. Abdominal examination revealed mild hepatomegaly and mild epigastric tenderness. A chest X-ray showed massive right side pleural effusion, for which he underwent pleural tapping. The results of pleural fluid analysis were as follows: amylase 1,560 U/L (reference range: 0-180 U/L), protein 4.9 g/dL (reference range: 0-3.5 g/dL), glucose 226 mg/dL (reference range: 0-60 mg/dL), total leukocyte count 160 mm<sup>-3</sup> (reference range: 0-100 mm<sup>-3</sup>) and adenosine deaminase 26 U/L (ADA; reference range: 0-32 U/L). Cytology for malignant cells was negative, and gram staining and culture showed no acid fast bacilli. Blood examination showed serum amylase levels of 632 U/L (reference range: 0-100 U/L) and a random blood glucose level of 138 mg/dL (reference range: 70-140 mg/dL). CT showed right side pleural effusion with evidence of chronic calcific pancreatitis. Upper gastrointestinal endoscopy revealed normal esophagus and stomach (with antral gastritis).

Abdominal MRCP was performed using a 3T MRI machine (Magnetom Verio, Siemens Medical Systems, Erlangen, Germany) with a phased-array body coil. MRI of the abdomen and MRCP (Figures 1, 2, 3) showed a dilated main pancreatic duct and side branches with a few intrapancreatic pseudocysts in the pancreatic head. There was fistulous communication from the pancreatic head up to the right pleural cavity suggestive of a pancreaticopleural fistula. Based on the

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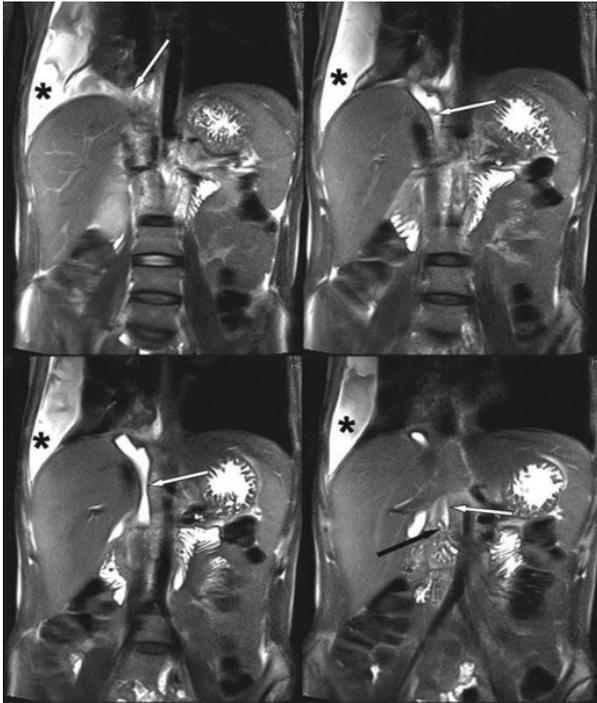
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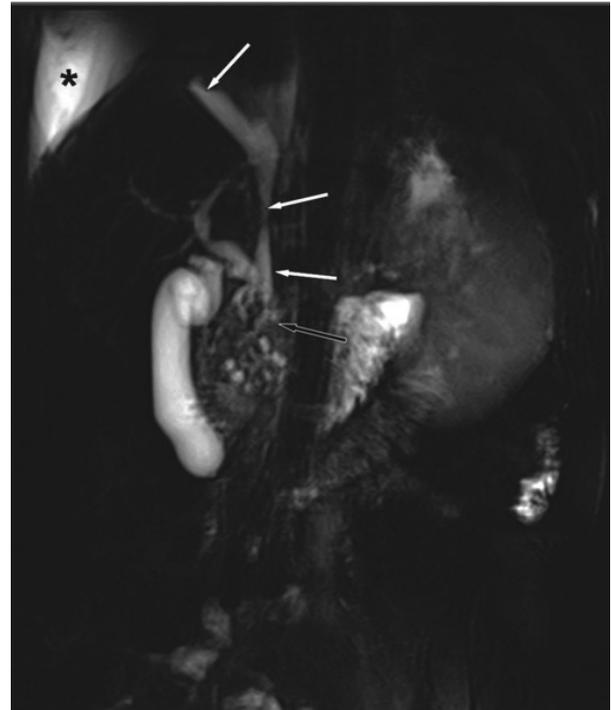
**Figure 1.** The T2-weighted 2D half-Fourier acquisition single-shot turbo spin echo (HASTE) coronal images showing fistulous communication (white arrows) extending from the pancreatic head region (black arrow) to the right pleural cavity which shows moderate effusion (asterisk). In addition, irregular dilations of the pancreatic duct side branches are also seen in the head region of pancreas.

clinical background, pleural fluid analysis and MRCP findings, a diagnosis of pancreaticopleural fistula was made. Endoscopic retrograde cholangiopancreatography (ERCP) showed bulging of the papilla. The pancreatic duct could not be selectively cannulated. Therefore, surgery was decided upon (pancreatico-jejunostomy).

## DISCUSSION

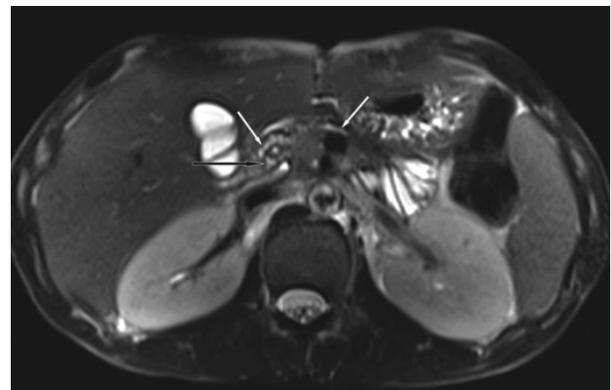
Pleural effusion associated with acute pancreatitis is usually small, left sided and described to be either chemically induced or sympathetic in nature, or due to the diffusion of pancreatic enzymes through diaphragmatic lymphatics [3, 4]. In chronic pancreatitis, pleural effusion occurs rarely by fistulization through a diaphragmatic hiatus of the aorta or esophagus [3, 4, 5]. Extrapancreatic communication of the pancreatic ducts or a pseudocyst in chronic pancreatitis can occur anteriorly into the peritoneum, in which case it forms a pancreaticoperitoneal fistula, or posteriorly into the retroperitoneum, forming an ascending pancreaticopleural fistula [6].

There is often a delay in diagnosis as these kinds of cases are rare and patients usually present more with thoracic symptoms than with abdominal symptoms. The presence of large, recurrent, rapidly accumulating, refractory pleural effusion in the clinical setting of pancreatitis should raise the suspicion of a pancreaticopleural fistula. Pancreaticothoracic fistulation can occur between the pancreas and pleural



**Figure 2.** The oblique coronal 3D MRCP sequence showing a pancreaticopleural fistula (white arrows) seen as a high-signal intensity structure arising from the pancreatic head (black arrows) reaching up to right pleural cavity (asterisk).

cavity or the mediastinum. When found in the mediastinum, a fistula can communicate with the pericardium (pancreaticopericardial), the tracheo-bronchial tree (pancreaticobronchial) or it can rupture into the esophagus [7]. The pleural fluid amylase content is significantly increased and the effusion is exudative in these conditions. But other causes of increased pleural fluid amylase levels should be excluded, such as acute pancreatitis, pulmonary tuberculosis, esophageal perforation, female genital tract malignancy, hydronephrosis, primary lung carcinoma, metastatic carcinoma, lymphoma, leukemia and liver cirrhosis [1, 2]. Pleural fluid amylase is much



**Figure 3.** The T2-weighted turbo spin echo (TSE) axial image showing a dilated main pancreatic duct and its side branches (white arrows) with a few small intrapancreatic pseudocysts in the pancreatic head (black arrow) which shows irregular contours and diffusely inhomogeneous signal intensity.

higher in comparison to serum amylase, the hallmark in these cases. The reason is that serum amylase is mainly increased through the transpleural absorption of amylase into the blood [4, 5].

Several techniques/methods are used to demonstrate a pancreaticopleural fistula. In the past, visualization of pancreaticopleural fistula was attempted with intrapleural injection of contrast media [4]. ERCP was the preferred and most widely used examination for demonstrating a pancreaticopleural fistula. Its advantages include direct visualization of the papilla and the adjacent anatomy, its ability to over-inject certain parts of the ducts where fistulae or strictures can occur and also to perform simultaneous endoscopic therapeutic procedures. However, it has certain drawbacks since it is invasive in nature, and is unable to see beyond the strictures. Visualization of a pancreaticopleural fistula can be achieved using CT. However, the sensitivity of CT is poor [3]. CT can demonstrate the pancreatic parenchymal atrophy, calcification, duct dilatation and pseudocysts. MRCP is the investigation of choice nowadays because of its non-invasive nature and its ability to visualize beyond the strictures. Moreover, in chronic pancreatitis, it can depict parenchymal atrophy, ductal anatomy and small intrapancreatic or extrapancreatic pseudocysts, peripancreatic collections or pancreaticopleural fistula if any [8]. Its disadvantages include a lack of therapeutic options and a lack of distension by contrast. In the indexed case, T2-weighted axial, coronal and MRCP images demonstrated the site of fistulization and exact anatomical relationship. This information is invaluable for surgical intervention. ERCP can be carried out in confusing cases as well as for treatment [1]. Fistulous communication can be demonstrated using ERCP; however, this is an invasive method. Hence, MRCP is the current investigation of choice because of its superiority as compared to CT [8].

Current available treatment methods are either medical or surgical options [9]. No controlled trials are available because of the rarity of cases. Amongst the medical therapeutic options, conservative management with thoracocentesis and somatostatin or its analogues have been tried in some cases. Forty to fifty percent of patients managed this way respond to treatment [3]. In cases of failure, some authors have used pancreatic

ductal stenting as the next line of treatment [2]. Cases of recurrence and failure underwent surgical management. Surgical procedures which are carried out for management of a pancreaticopleural fistula include pancreatic resection and drainage of the pseudocyst with or without enteropancreatic anastomosis [2].

Though a pancreaticopleural fistula is a rare condition, it should be included in the differential diagnosis of patients with pancreatitis and pleural effusion. MRCP is a very helpful modality in depicting the location and extent of a pancreaticopleural fistula, thereby helping in patient management as well as treatment.

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**Conflict of interest** The authors have no potential conflicts of interest

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