Radiology Case Reports 19 (2024) 6591–6595

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journal homepage: www.elsevier.com/locate/radcr

Case Report

Mediastinal extension of pancreatic pseudocyst through the esophagus hiatus: A case report ☆

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ARTICLE INFO

Article history:
Received 5 August 2024
Revised 1 September 2024
Accepted 3 September 2024

Keywords:
Mediastinal cyst
Pancreatic pseudocyst
Chronic pancreatitis
Mediastinal extension
Esophagus hiatus
Roux-en-Y cystojejunostomy

ABSTRACT

Pancreatic pseudocysts have a high amylase concentration and are surrounded by a fibrous capsule without a true epithelial lining. They are most frequently located in the peripancreatic region, and rarely extend into the mediastinum. We report a case of a 46-year-old male patient with a history of pancreatitis due to eat and drink too much presented with nausea and vomiting, MRI of the abdominal demonstrated a cystic mass connecting the abdominal cavity to posterior mediastinum and compressing the heart and stomach, ultrasound-guided aspiration of the cystic mass revealed high levels of amylase, conffrming that the mass was a rare pancreatic pseudocyst extending into the mediastinum. He was admitted for expectant management and was successfully treated with cystojejunostomy. This case aims to illustrate the possibility of rare pancreatic pseudocysts when a cystic mass is found that penetrates the abdominal and thoracic cavities.

Introduction

Pancreatic pseudocysts are relatively common complications of chronic pancreatitis. The most common is that they expand into the surrounding structures, but sometimes can be localized in some unusual areas, one of which is the mediastinum. Mediastinal pancreatic pseudocyst (MPP) is a rare finding that typically presents with atypical symptoms. It may be caused by the formation of cysts during the initial attack of acute pancreatitis. Due to insidious symptoms and untreated time, exuded pancreatic juice erodes the diaphragmatic tissue around the esophageal and aortic foramen, resulting in physiological structural destruction, causing the pancreatic

☆ Competing Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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https://doi.org/10.1016/j.radcr.2024.09.017

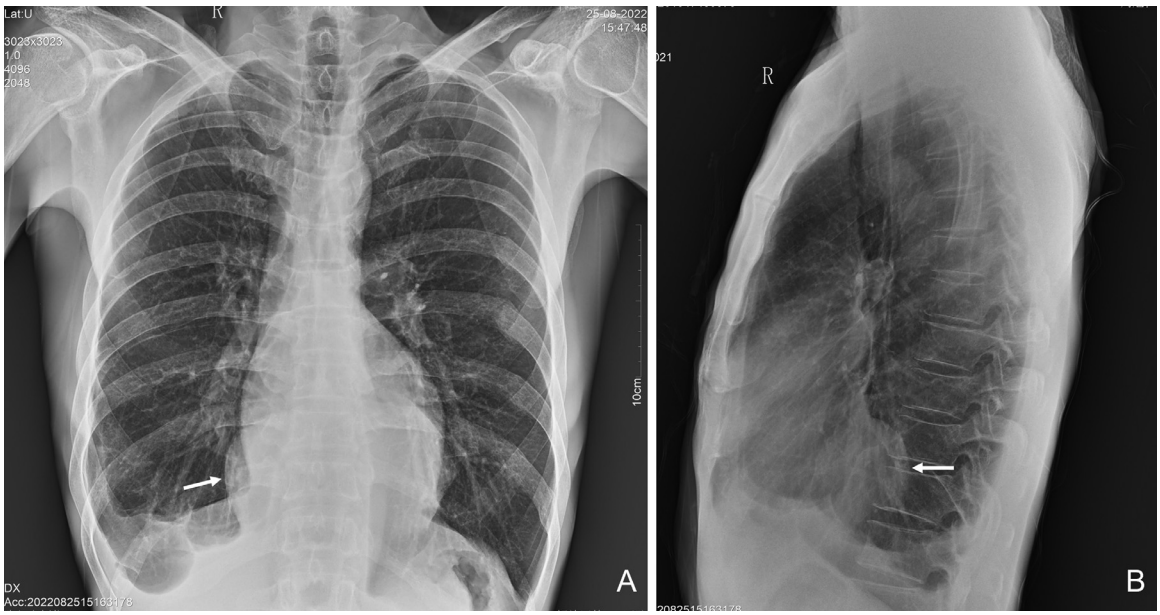

Fig. 1 – Orthostatic chest x-ray (A) shows circular high-density shadows overlapping in the cardiac shadow area (white arrow), and the lesion is located in the posterior mediastinum on lateral view (white arrow in B).

pseudocyst to expand upward into the posterior mediastinum [1]. We herein report a case of pancreatic pseudocyst extending to the mediastinum to deepen our understanding of this disease and reduce misdiagnosis and missed diagnosis.

Case report

We present a case of a 46-year-old man with a history of pancreatitis due to eat and drink too much, who was admitted to our department with repeated nausea and vomiting for 2 weeks. His blood count, the levels of cardiac and liver enzymes as well as the results of renal function tests were normal. Chest X-ray revealed a round-like high-density shadow overlapping the cardiac area, which was located in the posterior mediastinum on lateral view (Figs. 1A and B). Abdominal ultrasound (US) showed cystic mass above the tail of the pancreas, and a pancreatic pseudocyst was considered. On further evaluation with magnetic resonance imaging (MRI), we observed an encapsulated "8″ -shaped fluid collection measuring 11.7 cm × 11.7 cm × 9.8 cm, which was connected to the pancreas and extended to the posterior mediastinum, compressing the heart and deviating the esophagus as well as the stomach (Fig. 2A). Furthermore, obvious ring enhancement in the capsule and no enhancement in the center was observed (Fig. 2B). To relieve the patient's discomfort due to mass compression, ultrasound-guided drainage of the pancreatic pseudocyst was

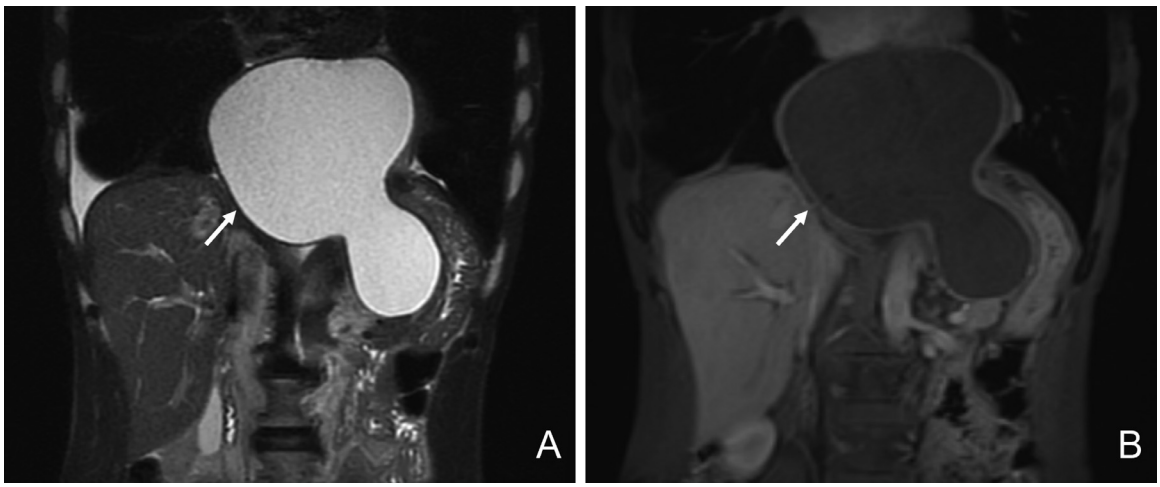

Fig. 2 – Abdominal MRI scan (coronal) reveals a pseudocys with long T2 signal extending from the tail of the pancreas to the posterior mediastinum (white arrow in A) and with ring enhancement on enhanced scan (white arrow in B).

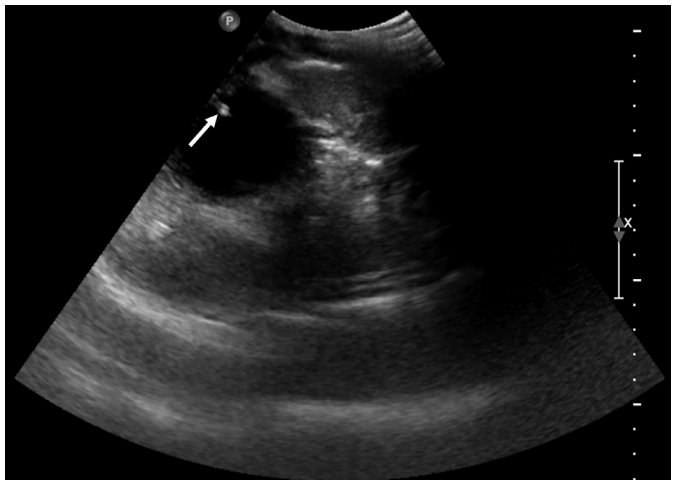

Fig. 3 – Endosonography-guided drainage of the pancreatic pseudocyst, with drainage tube ultrasonic image (white arrow) inside the cyst.

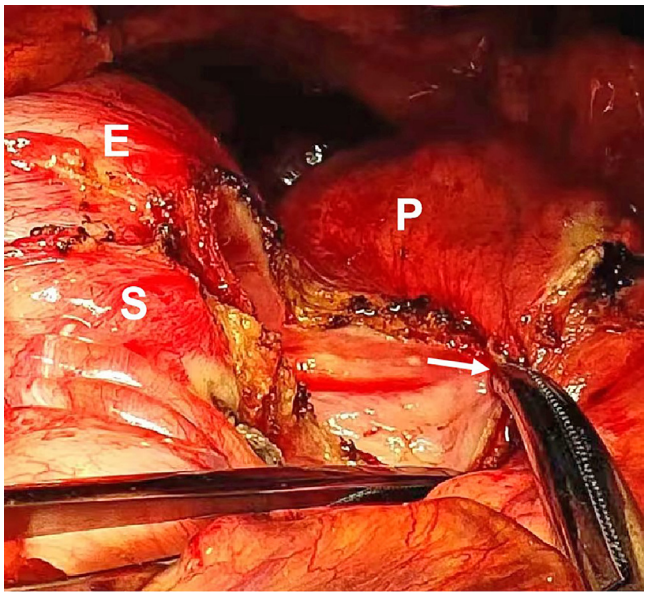

Fig. 4 – Intraoperative pictures of the pseudocysto-jejuno-anastomosis showed the pseudocyst communicated with pancreatic duct (white arrow). esophagus—E, stomach—S, pseudocyst—P.

performed and 800 mL of black brown fluid was removed and confirmed with high level amylase (15,774 U/L) (Fig. 3). Tumor markers were within normal ranges. Thus, the suspected diagnosis of pancreatic pseudocyst was confirmed. In order to eliminate the cyst and avoid recurrence, the surgeon finally decided to construct a Roux-en-Y cystojejunostomy. During the operation, they verified the passage to the chest through the esophageal hiatus and the pseudocyst communicated with the pancreatic duct with a sufficiently mature wall for a side-to-side anastomosis (Fig. 4). The postoperative recovery was satisfying. Two weeks after the procedure, the patient was discharged in good clinical condition and scheduled for outpatient observation. After 3 months, the follow up CT scan demonstrated near complete post-treatment resolution of the pancreatic pseudocyst (Fig. 5).

Discussion

Pseudocyst was considered as one of the early complications of acute pancreatitis in the newly revised Atlanta criteria [2]. Although 2% of pancreatitis results in pseudocyst formation, only 0.4% of cases show intrathoracic extension, which makes it a quite uncommon complication [3]. Recurrent attacks of acute pancreatitis result in rupture of the pancreatic duct and the pancreatic fluid is usually confined to the retroperitoneal space, occasionally, however, it slips through the esophagus or aortic hiatus into the posterior mediastinum, leading to the formation of pseudocysts [4]. They can occur at any age, and chronic alcoholism is a common cause in adults. These patients typically present with complaints of vague/diffuse epigastric pain, dyspnea, dysphagia, or retrosternal discomfort [5]. These symptoms can often be misleading as they are mostly a result of compression of the mediastinal structures. Pseudocysts may also rupture, bleed, or become infected, further complicating the clinical process [6]. Differential diagnoses to consider for posterior mediastinal cystic lesions include bronchial cyst, neurenteric cyst, schwannoma, hernia, and paraspinal abscess. In our case, although the cyst protruding into the mediastinum had a larger volume than the abdominal cavity, causing significant compression on the mediastinal structure, the patient presented with atypical gastrointestinal symptoms of nausea and vomiting. Since physical examination is mostly inconclusive, investigations play a greater role in determining the diagnosis. Blood investigations help to point the etiology toward a pancreatic origin as serum amylase is always elevated [7]. However, the diagnosis of a mediastinal pseudocyst is usually confirmed by various

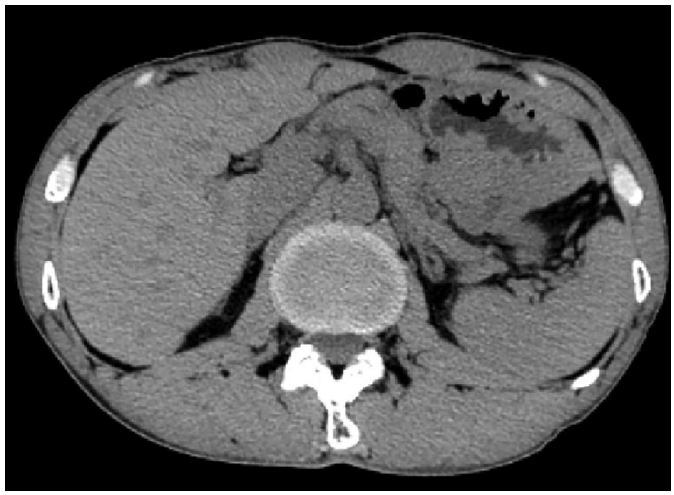

Fig. 5 – 3 months after treatment, the CT scan contrast demonstrated near complete post-treatment resolution of the pancreatic pseudocyst.

radiologic investigations such as computed tomography (CT), ultrasound, and magnetic resonance cholangiopancreatography (MRCP). Abdomen ultrasound can easily demonstrate a peripancreatic collection, but may not have much advantage in delineating a mediastinal pseudocyst due to its location. CT scans of the abdomen and chest with contrast enhancement can not only outline pancreatic anomalies but also detect mediastinal components. However, abdominal MRI provides detailed information about the morphology of the pancreatic ducts, meanwhile, MRCP is the best way to detect stricture/dilatation of duct and communication with pseudocyst. Endoscopic ultrasound can be used as a diagnostic and therapeutic tool as it can not only detect the mediastinal extension of pseudocysts, but also be used for cyst aspiration [8,9]. When high levels of amylase are found within the fluid following ultrasound-guided aspiration, the diagnosis is confirmed. Our patient had a history of pancreatitis and the definitive diagnosis was made through enhanced abdominal MRI scan, when high amylase levels were found in the liquid after ultrasound-guided aspiration, the diagnosis was further confirmed.

Spontaneous regression of mediastinal pancreatic pseudocysts is extremely rare. Therefore, medical, surgical, and endoscopic interventions are usually required [10]. There are various treatment options to choose from, but there is currently no consensus on the best treatment method for mediastinal pancreatic pseudocysts [11]. According to the etiology, pancreatic duct abnormalities, patient symptoms and experience in diagnosis and treatment, the main goals of conservative treatment for all patients should be abstinence from alcohol, diet, and enzyme supplementation [12]. Further treatment depends on the size, quantity, location, relationship with adjacent anatomical structures, severity of symptoms, presence of infection, and connectivity between the pseudocyst and the pancreatic duct [13]. Drainage of a mature pseudocyst is the preferred treatment choice, which can be performed through resection, external drainage, internal drainage, or endoscopic drainage. It has been reported that there is no significant difference in the resolution of the pseudocysts between surgical and endoscopic techniques, thus, the minimally invasive cystogastrostomy was recommended [14]. Although surgical treatment is invasive, however, Watanabe S, et al. suggested that all unstable patients with life-threatening complications should undergo open surgical treatment. In addition, surgical treatment is particularly advisable for pseudocysts accompanied by infection, obstruction, rupture, or bleeding [15]. In our case, the patient had obvious compression symptoms such as nausea and vomiting, which affected eating. After comprehensive evaluation, B-ultrasound-guided drainage of pancreatic pseudocyst was performed, in order to completely cure and avoid repeated infection within the cyst, Roux-en-Y cystojejunostomy was ultimately adopted, but there was also a potential risk of long-term anastomotic stenosis. Fortunately, the patient has been followed up for 1 year and has recovered well.

Conclusions

The difficulty of mediastinal pancreatic pseudocyst lies in the nonspecific clinical manifestations. For patients with atypical gastrointestinal symptoms such as nausea, vomiting, and swallowing difficulties, combined with a history of pancreatitis, high vigilance should be exercised against the possibility of mediastinal pancreatic pseudocyst, and timely diagnosis and treatment should be carried out to avoid more serious life-threatening complications such as empyema, pseudocyst esophagus, or pseudocyst tracheal fistula.

Authors' contributions data compilation

Data compilation: Gang Chen, Hou-Tan Sun; Supervision and image editor: Li-Na Yue, Kang Liu; Writing—original draft: Yu-Feng Bai, Juan-Qin Niu; Writing—review and editing: Jian-Ying Shangguan, Si-Yang Zuo. Bai YF and Niu JQ contributed

equally to this project as co-first authors. All authors read and approved final version of this manuscript.

Patient consent

Written informed consent was obtained from the patient for the publication of patient information in this article.

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