

CASE REPORT

Mediastinal Pseudocyst with Pericardial Effusion and Dysphagia Treated by Endoscopic Drainage

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ABSTRACT

Context Pancreatic pseudocysts located in the mediastinum are rare. Symptomatic mediastinal pseudocysts can present with dysphagia, dyspnea, airway obstruction and/or cardiac tamponade. Generally, the standard approaches are surgery and external drainage. Recently, there have been many reports of successful endoscopic drainage mainly using a transpapillary technique. However, there have only been a handful of reports involving successful transmural drainage of mediastinal pseudocysts.

Case report We report a case of a mediastinal pseudocyst developed after a severe blunt trauma. The patient presented with orthopnea and dysphagia. Multidetector computerized scanning of the abdomen and thorax revealed a thin, cystic, low-attenuation mass in the posterior mediastinum associated with compression of the esophagus and significant pericardial effusion. An endoscopic retrograde pancreatogram demonstrated a normal size pancreatic duct with an extravasation of contrast from the tail of the pancreas into the cyst. Ultimately, the cyst was successfully drained through gastric fundus.

Conclusion Symptomatic mediastinal pseudocysts communicating with the

pericardial sac can be successfully drained using a transmural endoscopic approach without the need for surgery or external drainage.

INTRODUCTION

Acute pancreatitis is a common condition. One of its complications is pseudocyst formation which is usually located in the abdomen. There have been several case reports of mediastinal extension of pancreatic pseudocysts but only a handful of cases report on dysphagia associated with mediastinal pseudocyst formation [1, 2, 3, 4]. Moreover, few cases of acute pancreatitis associated with pericardial effusion have been reported [5, 6]. To our knowledge, this is the first report of endoscopic treatment of a mediastinal pseudocyst causing dysphagia accompanied by pericardial effusion.

CASE REPORT

A 43-year-old Thai male with a history of cigarette smoking (2 packs/day) and 30 g/day of alcohol consumption for about 30 years was admitted to our hospital with a 2-week history of epigastric pain. He noticed that the pain started while he was lifting a heavy iron bar and reached its peak within a few minutes. This pain was in his left chest and

interscapular area and it consisted of a constant dull ache. He also had episodes of sharp shooting pain precipitated by deep breathing. Sitting and bending forward was the only position which could relieve his pain. He therefore went to sleep at night in an upright position.

At the beginning, he went to another hospital and was admitted for 9 days. An electrocardiogram revealed that he had supraventricular tachycardia (SVT) and an echocardiogram found a small amount of

pericardial effusion with a left ventricular ejection fraction of 67.5%. The SVT was converted by 6 mg of adenosine administered intravenously and his cardiac rhythm was stable after that. He was discharged with verapamil, digoxin, enalapril, aspirin, isosorbide dinitrate and omeprazole. Three days after discharge, he reported a worsening of his symptoms. Subsequently, he again developed solid food dysphagia.

His past medical history disclosed that he had once been admitted to another hospital, 7 months earlier for 5 days because a steel bar had hit him on his left chest causing left hemothorax. This had been treated by intercostal tube drainage. He also had a history of episodic postprandial epigastric discomfort, which was relieved by acid lowering drugs

Physical Examination

The patient appeared thin for his body size. His body weight was only 42 kg (BMI: 15.63 kg/m²). His vital signs were within the normal range. He had no jaundice. His skin showed no sign of chronic liver stigmata. Cardiac examination showed pericardial rub without physical signs of cardiac tamponade. Abdominal examination demonstrated a huge ill-defined abdominal mass with cystic consistency at the epigastrium with active bowel sound. He also had digital clubbing. The rest of the examination was unremarkable.

Laboratory Findings

Hemoglobin 9.6 g/dL (reference range: 12.5-16.0 g/dL); hematocrit 28.9% (reference range: 39-45%); WBC 4.96x10³/μL (reference range: 1.5-7.5x10³/μL); 63% neutrophil (reference range: 40-75%) and 24% lymphocyte (reference range: 20-50%); platelet 284x10³/μL (reference range: 120-400x10³/μL); random plasma glucose 176 mg/dL (reference range: 80-110 mg/dL); BUN 5 mg/dL (reference range: 5-12 mg/dL); creatinine 0.7 mg/dL (reference range: 0.3-1.2 mg/dL); calcium 8.4 mmol/dL (reference

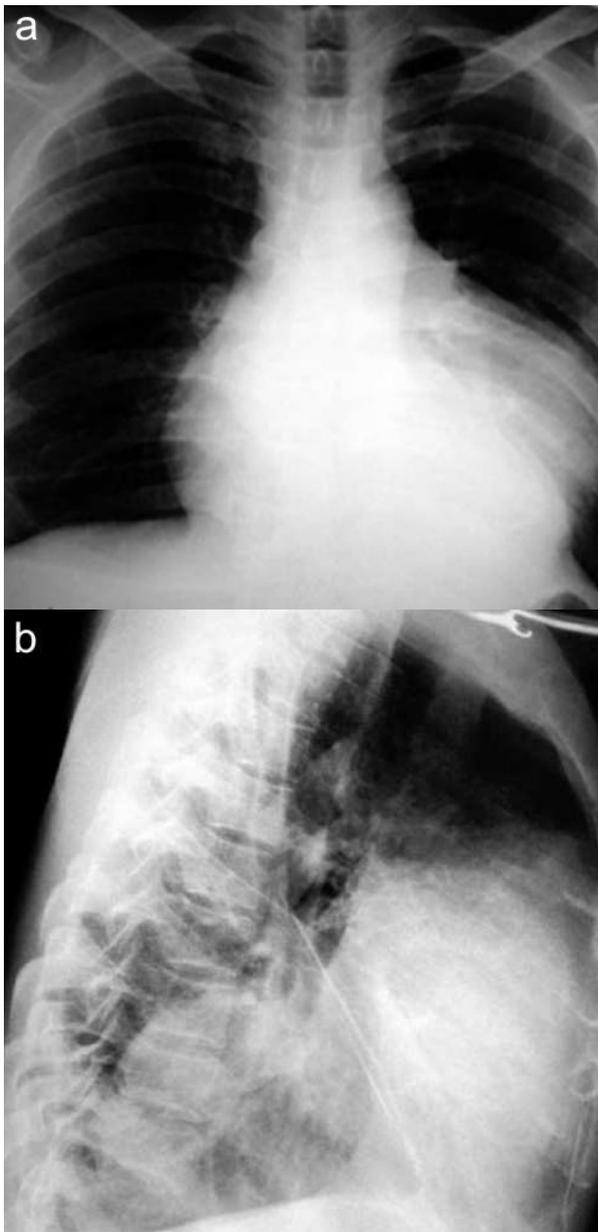


Figure 1. Chest radiographs showing an enlarged cardiac shadow with a large retro-cardiac mass-like lesion.

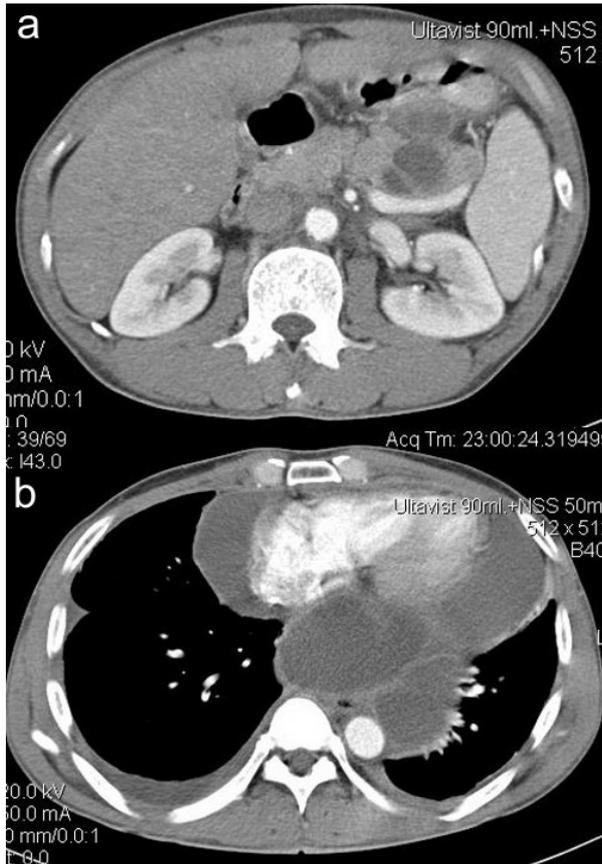


Figure 2. a. CT scan showing cystic lesions adjacent to pancreatic tail. There is no dilation of the pancreatic duct or calcification to suggest chronic pancreatitis. **b.** CT scan showing a thin, cystic, low-attenuation mass in the posterior mediastinum associated with compression of the esophagus. A large amount of pericardial effusion is noted. Left pleural effusion is also detected.

range 7.5-9.0 mmol/dL); albumin 3.0 g/dL (reference range: 3.0-5.5 g/dL); serum AST 13 IU/L (reference range: 0-38 IU/L) ; serum ALT 8 IU/L (reference range:0-38 IU/L) ; amylase 285 IU/L (references range: 0-160 IU/L) and lipase 250 IU/L (reference range: 0-160 IU/L).

Imaging Findings

Chest radiographs (Figure 1) revealed an enlarged cardiac shadow with a large retrocardiac mass-like lesion. Echocardiography demonstrated a large amount of pericardial effusion, measuring 25 mm thickness anteriorly and 30 mm posteriorly without any sign of cardiac tamponade. A CT scan showed a thin, cystic, low-attenuation

mass in the posterior mediastinum associated with esophageal compression and significant pericardial effusion. The pancreas appeared normal without any evidence of chronic pancreatitis such as a dilated pancreatic duct or calcification. There was a 4 cm cystic mass at the tail of the pancreas. This cyst appeared to communicate with the mediastinal cyst (Figure 2).

Due to the patient's severe discomfort, he underwent urgent ERCP for endoscopic drainage. The pancreatogram demonstrated a normal sized pancreatic duct from head to tail (Figure 3). There was a significant extravasation of contrast into a large cystic mass in the mediastinum connecting to the pericardial sac (picture not available).

Interventions and Follow-up

Since there was a prominent bulging area with mucosal inflammation at the gastric fundus, a transgastric puncture was performed without the need for endoscopic ultrasonography guidance. Then a 1.5 cm CRE balloon (Boston Scientific Cooperation, Water Town, MA, USA) was used to dilate the stoma. Immediately upon finishing stoma dilation, there was a gush of clear fluid coming out.

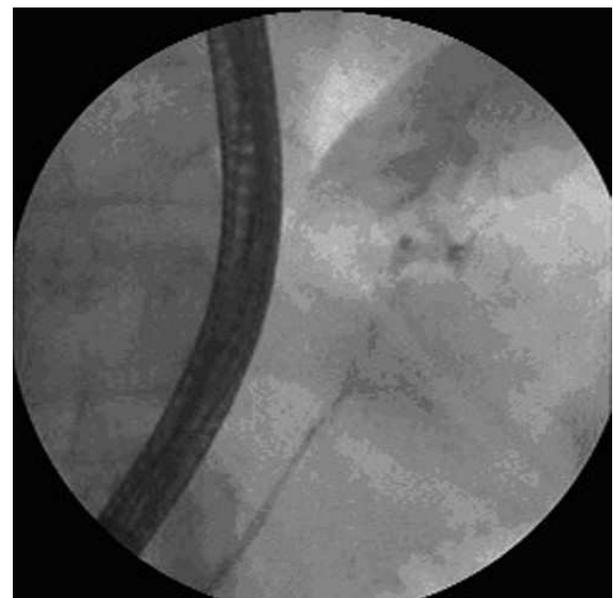


Figure 3. Pancreatogram demonstrating the normal size of a pancreatic duct from head to tail. There is a significant extravasation of contrast from the tail into a large cyst (white arrow).

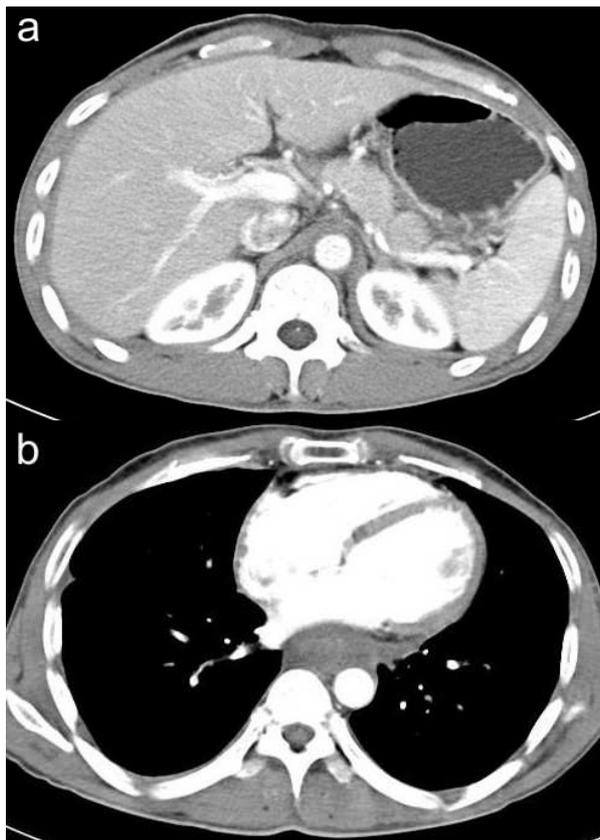


Figure 4. a. Abdominal CT scan 1 month later showing the complete resolution of the abdominal part of the pseudocyst. **b.** Thoracic CT scan showing undetectable pericardial fluid.

The amount of fluid aspirated during this process was 1.5 L. Subsequently, a 10 Fr 10 cm double pigtail stent (Boston Scientific Cooperation, Water Town, MA, USA) was placed to keep the stoma open. The patient reported immediate relief of his symptoms and was able to lay supine at the end of the procedure. Subsequently, he was discharged 9 days after this endoscopic drainage.

A repeat CT scan one month later confirmed a nearly complete resolution of the pseudocyst, and pericardial fluid was undetectable (Figure 4). The stent was removed 2 months later. During a 6-month follow up, there were no any recurrent symptoms. He was able to eat normally and gained 12 kg.

DISCUSSION

A pseudocyst is one of the most common complications of acute and chronic pancreatitis. The majority of pseudocysts are

located in the abdomen. The main cause is pancreatic juice leakage. The juice can leak from anywhere around the pancreas. Pseudocyst formation can take place wherever tissue plane has the least resistance.

The extra-abdominal extension of a pancreatic pseudocyst is uncommon. The present case demonstrated that the pseudocyst was in the posterior mediastinum. In general, mediastinal pancreatic pseudocysts tend to extend through the aortic and esophageal hiatus; therefore, the posterior mediastinum is the most common location [7, 8, 9]. Less commonly, pseudocysts located in the anterior mediastinum can come from the foramen of Morgagni. Rarely can pseudocysts directly erode through the diaphragm causing mid-mediastinal mass [9]. Other atypical sites include the liver, spleen and stomach wall. Natural pathways for their development include hepatoduodenal, gastrohepatic and gastrosplenic ligaments [5].

The pathogenesis of the extra-abdominal extension of pancreatic pseudocysts is that the pseudocysts extend along the fascial planes which offer the least resistance and may result in mediastinal pseudocyst formation. Most researchers have reported cases associated with alcohol-associated pancreatitis. In this patient, the etiology of the pancreatic duct leak is believed to be secondary to the abdominal blunt injury. There was no pancreatic duct dilation or calcification by CT scan or ERCP to support evidence of chronic pancreatitis. However, chronic pancreatitis could not be excluded since our patient had a history of a significant amount of alcohol consumption and endoscopic ultrasonography was not performed to diagnose chronic pancreatitis. The symptoms of mediastinal pseudocysts include abdominal pain, back pain, chest pain, dyspnea, dysphagia, odynophagia, pseudoachalasia, cardiac tamponade, and weight loss [9, 10]. It is very unusual that dysphagia and cardiac symptoms were presented together in one individual such as our patient.

Chest X-ray may reveal cardiac enlargement, pleural effusion (most commonly left-sided), posterior mediastinal mass or retrocardiac

mass [9]. A cystic posterior mediastinal mass which develops over a short period of time in a patient with pancreatitis is a finding which could help in the diagnosis [7]. An enlarged cardiac shadow in our patient represented pericardial effusion.

CT scan and ERCP are useful for diagnosis and planning treatment strategies. Moreover, ERCP can offer endoscopic transpapillary or transgastric drainage of a pseudocyst. The pseudocyst almost always occurs in the lower part of the posterior mediastinum [7]. However, an abdominal component is common but is not always present [7].

Mostly, in several case reports, the majority of large mediastinal pancreatic pseudocysts have successfully been treated by surgical means [11, 12]. Endoscopic drainage can be performed using either the transpapillary or the transmural technique. There are very few series [13, 14, 15, 16] and in only one series did Bhasin *et al.* report a successful resolution of a mediastinal pseudocyst and pleural effusion by transpapillary drainage [13]. Mohl *et al.* demonstrated that transhiatal drainage of a mediastinal pseudocyst can be performed safely without the need for surgery [14]. Endoscopic drainage was chosen as a mode of treatment in this patient for many reasons: 1) it can be done in an urgent situation; 2) the esophagus can be evaluated since our patient had a history of dysphagia; 3) communication between the pancreatic duct and the cyst can be demonstrated by a pancreatogram.

Endoscopy demonstrated that one side of the mediastinal pseudocyst was located adjacent to the gastric fundic wall appearing as a large bulging area; therefore, endosonography was not required. This, in turn, led to a successful endoscopic cystogastrostomy. In addition, the fluid in the pericardial cavity was found to communicate with the mediastinal pseudocyst. Therefore, pericardiocentesis was not necessary. In contrast, pericardial tapping alone is not adequate and can cause a fistula if there is direct communication between the pericardial sac and the pancreatic duct. Pseudocyst and mediastinal infection was also a concern. A larger series demonstrated that the risk of infection from this procedure is

low and acceptable [17]. Recently, a group from the Mayo Clinic reported that endoscopic transmural drainage of a pseudocyst can be performed safely and effectively in selected outpatients [18]. Fortunately, our patient did well without evidence of infection after the procedure. However, intravenous ceftriaxone was given for 7 days until he was discharged from the hospital.

Currently, there are many advanced modalities to facilitate pseudocyst drainage. Endosonography can identify the site to be punctured in a non-bulging pseudocyst. It also can help the endoscopist to avoid major vessels at the site punctured [19]. In addition, a magnetic retrograde pancreatogram (MRP) is also a useful method of diagnosing a pancreatic duct injury and leak [20]. Its use may be appropriate in a patient with a disconnected pancreatic duct. However, the use of MRP in routine pseudocyst evaluation is not yet a standard practice. Our patient reported immediate improvement of his symptoms. A chest radiograph showed a marked decrease in cardiac shadow and an echocardiogram performed on the same day after the endoscopic drainage showed a significant reduction in the amount of pericardial effusion, 5 mm anteriorly and posteriorly. The patient was able to resume a normal diet within 5 days. He was discharged from the hospital on the 9th day after this endoscopic drainage.

In summary, a mediastinal pseudocyst is rare but a combination of mediastinal pseudocyst and pericardial effusion is much rarer. This case report has shown that endoscopic drainage is a very useful method for patients having a mediastinal pseudocyst with pericardial effusion who presented with esophageal dysphagia and orthopnea. In addition, pericardiocentesis can be avoided if there is communication between the pericardial sac and the pseudocyst.

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Keywords Drainage; Endoscopy; Pancreatic Pseudocyst; Pericardial Effusion

Abbreviations MRP: magnetic retrograde pancreatogram; SVT: supraventricular tachycardia

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References

1. Chettupuzha AP, Harikumar R, Kumar SK, Thomas V, Devi SR. Pancreatic pseudocyst presenting as odynophagia. *Indian J Gastroenterol* 2004; 23:27-8. [PMID 15106715]
2. Obuszko Z, Beggs D. Dysphagia due to pancreatic pseudocyst with mediastinal extension. *Eur J Cardiothorac Surg* 1998; 13:316-8. [PMID 9628385]
3. Colarian JH, Sekkarie M, Rao R. Pancreatic pseudocyst mimicking idiopathic achalasia. *Am J Gastroenterol* 1998; 93:103-5. [PMID 9448185]
4. Shah A, Schwartz H. Echocardiographic features of cardiac compression by mediastinal pancreatic pseudocyst. *Chest* 1980; 77:440-3. [PMID 7357952]
5. Leggett JJ, Mainie I, Mackle E, McAteer E, Convery RP. An unusual case of travel sickness. *Chest* 2003; 124:1594-7. [PMID 14555595]
6. Pezzilli R, Billi P, Bertaccini B, Gullo L. Pericardial effusion and left ventricular function in acute pancreatitis. *Am J Gastroenterol* 1996 ; 91:997-1000. [PMID 8633595]
7. Jeung MY, Gasser B, Gangi A, Bogorin A, Charneau D, Wihlm JM, et al. Imaging of cystic masses of the mediastinum. *Radiographics* 2002; 22:S79-93. [PMID 12376602]
8. Casson AG, Inculet R. Pancreatic pseudocyst. An uncommon mediastinal mass. *Chest* 1990; 98:717-8. [PMID 2394146]
9. Zeilender S, Turner MA, Glauser FL. Mediastinal pseudocyst associated with chronic pleural effusions. *Chest* 1990; 97:1014-6. [PMID 2323237]
10. Rose EA, Haider M, Yang SK, Telmos AJ. Mediastinal extension of a pancreatic pseudocyst. *Am J Gastroenterol* 2000; 95:3638-9. [PMID 11151907]
11. Tsuei BJ, Schwartz RW. Current management of pancreatic pseudocysts. *Curr Surg* 2003; 60:587-90. [PMID 14972194]
12. Bali A, Walker DA, Iredale JP, Johnson CD. Respiratory compromise relieved by laparotomy. *Postgrad Med J* 2000; 76:448-50. [PMID 10878217]
13. Bhasin DK, Rana SS, Chandail VS, Nanda M, Sinha SK, Nagi B. Successful resolution of a mediastinal pseudocyst and pancreatic pleural effusion by endoscopic nasopancreatic drainage. *JOP. J Pancreas (Online)* 2005; 6:359-64. [PMID 16006688]
14. Mohl W, Moser C, Kramann B, Zeuzem S, Stallmach A. Endoscopic transhiatal drainage of a mediastinal pancreatic pseudocyst. *Endoscopy* 2004; 36:467. [PMID 15100970]
15. Mallavarapu R, Habib TH, Elton E, Goldberg MJ. Resolution of mediastinal pancreatic pseudocysts with transpapillary stent placement. *Gastrointest Endosc* 2001; 53:367-70. [PMID 11231406]
16. Kim DJ, Chung HW, Gham CW, Na HG, Park SW, Lee SJ, et al. A case of complete resolution of mediastinal pseudocyst and pleural effusion by endoscopic stenting of pancreatic duct. *Yonsei Med J* 2003; 44:727-31. [PMID 12950133]
17. Cahen D, Rauws E, Fockens P, Weverling G, Huijbregtse K, Bruno M. Endoscopic drainage of pancreatic pseudocysts: long-term outcome and procedural factors associated with safe and successful treatment. *Endoscopy* 2005; 37:977-83. [PMID 16189770]
18. Gibbs CM, Baron TH. Outcome following endoscopic transmural drainage of pancreatic fluid collections in outpatients. *J Clin Gastroenterol* 2005; 39:634-7. [PMID 1600093]
19. Baron TH. Endoscopic drainage of pancreatic fluid collections and pancreatic necrosis. *Gastrointest Endosc Clin N Am* 2003; 13:743-64. [PMID 14986796]
20. Fulcher AS, Turner MA, Yelon JA, McClain LC, Broderick T, Ivatury RR, Sugerman HJ. Magnetic resonance cholangiopancreatography (MRCP) in the assessment of pancreatic duct trauma and its sequelae: preliminary findings. *J Trauma* 2000; 48:1001-7. [PMID 10866243]