

Case report - Thoracic non-oncologic Thoracoscopic drainage of ascending mediastinitis arising from pancreatic pseudocyst

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Abstract

Acute mediastinitis is a life-threatening disease. Common etiologies include surgical infection, esophageal perforation, and descending necrotizing mediastinitis from the oral cavity or pharynx. Mediastinitis caused by pancreatic disease is rare. The most common thoracic complication of pancreatic disease is reactive pleural effusion. We report a case of acute mediastinitis and bilateral empyema thoracis arising from a pancreatic pseudocyst. We utilized thoracoscopy to drain the mediastinum without drainage of the intra-abdominal cyst. The patient recovered well after operation.

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Keywords: Mediastinitis; Pancreatic pseudocyst; Thoracoscopy

1. Introduction

Acute mediastinitis is a life-threatening disease. Common causes of acute mediastinitis include surgical infection, esophageal rupture, and descending infection from the pharynx. Ascending infection from an intra-abdominal focus to the mediastinum is very rare. We report a case of acute mediastinitis arising from a pancreatic pseudocyst.

2. Clinical summary

A 41-year-old man was admitted to our emergency department after presenting with intense persistent precordial chest pain radiating to the back, and lasting one day. On admission, he also had high fever (40.4 °C), tachycardia, and dyspnea. There was no past history of trauma, or of symptoms related to the respiratory system or gastrointestinal tract. However, he suffered from alcoholic liver disease and hypertension that had not been treated adequately.

On physical examination, he had mild abdominal pain without peritoneal signs. Chest wall expansion and breathing sounds were symmetric and clear. Lab testing showed leukocytosis with a left shift (white blood cells (WBC): 17,310/ μ l, neutrophils: 92.4%). Blood chemistry showed elevated amylase (310 U/l) and lipase (470 U/l) levels, as well as hyperglycemia (293 mg/dl). Chest film disclosed bilateral pleural effusion. Thoracentesis was done, and the pleural effusion revealed high levels of lactate dehydrogenase (2866 IU/l), amylase (12,500 U/l),

and WBC (58,500/ μ l, neutrophils: 88%). Other biochemistry studies of the pleural effusion revealed a glucose level of 143 mg/dl and a total protein of 4.8 g/dl. These results suggested an empyema thoracis of esophageal or pancreatic etiology.

Chest computed tomography (CT) showed: (1) fluid accumulation in the posterior mediastinum and bilaterally in the pleural cavity, and (2) a pancreatic cyst extending upward into the posterior mediastinum (Fig. 1). Contrast study of the esophagus excluded the possibility of esophageal perforation. A pancreatic pseudocyst extending to the mediastinum, leading to mediastinitis and empyema thoracis, was diagnosed. The patient was empirically commenced on a broad-spectrum antibiotic (Tazocin, 3.375 g IV. q6h). Emergency surgical drainage of the mediastinum and bilateral pleural cavity was performed, using bilateral video-assisted thoracoscopic surgery (VATS), and including bilateral drainage of the pleural cavity, opening of the bilateral mediastinal pleura, and drainage of the mediastinum. Operative findings were necrotic tissue at the paraesophageal area and turbid pleural effusion and fibrin coating in the pleural cavities. Two 28 F chest tubes were placed in the right pleural cavity, and one 28 F chest tube was placed in the left pleural cavity.

The patient stayed in the intensive care unit postoperatively for two days because of systemic inflammatory response syndrome. Fever, chest pain, and toxic signs resolved on the first postoperative day. Chest tubes were removed one week after surgery, and antibiotic treatment continued for 10 days. Pleural effusion culture yielded no microorganism. The patient was discharged two weeks post-operation. Chest CT was performed as follow-up one month after surgery and showed complete resolution of the

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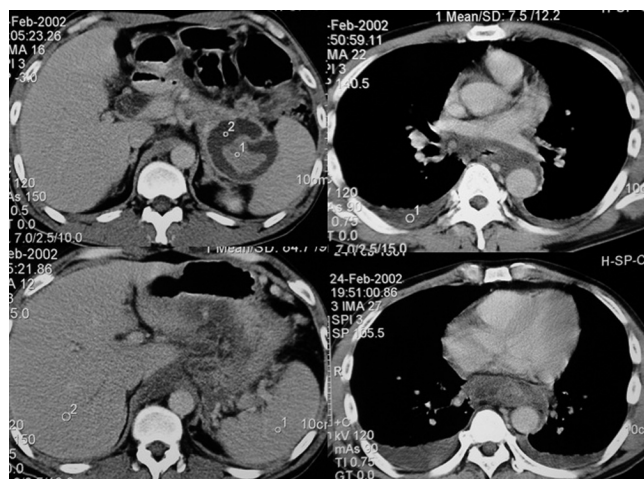


Fig. 1. Chest CT showed a pancreatic cyst extending upward to the mediastinum, leading to mediastinitis and bilateral empyema.

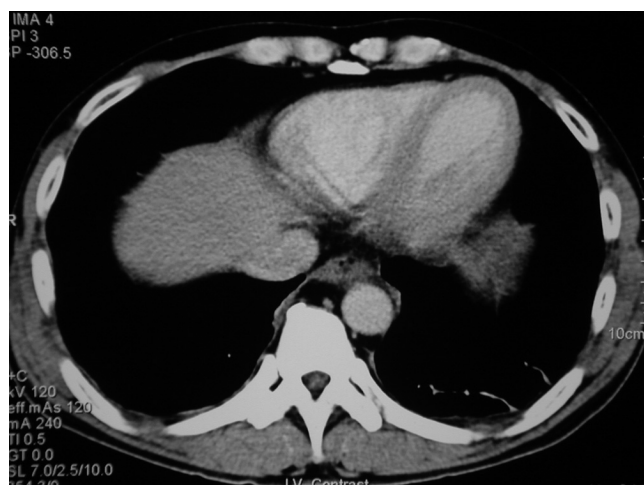


Fig. 2. Chest CT one month postoperation revealed complete resolution of the mediastinitis and empyema.

inflammation in the mediastinum and bilateral pleural cavities (Fig. 2), although the pancreatic pseudocyst persisted.

3. Discussion

Extension of a pancreatic pseudocyst into the mediastinum is rare [1, 2]. Drainage of the mediastinal pancreatic pseudocyst is the key to success, and a variety of methods have been reported, including traditional external or internal drainage, and endoscopic stents [3]. Successful treatment of mediastinal pancreatic pseudocyst with sandostatin has also been reported [4]. However, frank mediastinitis arising from pancreatic pseudocyst, as in our case, is even rarer. Common etiologies of acute mediastinitis include surgical infection, esophageal perforation, and descending necrotizing mediastinitis from the oral cavity or pharynx. Our case manifested with ascending widespread necrosis and abscess formation, similar to the fulminant course of descending necrotizing mediastinitis. Acute mediastinitis

is a serious, life-threatening complication; and surgical drainage of the mediastinum and pleural cavities, and broad-spectrum antibiotic treatment were certainly the appropriate management.

Historically, several approaches for mediastinal drainage have been proposed: transcervical, subxiphoid, median sternotomy, and posterolateral thoracotomy [5, 6]. Traditionally, for drainage of posterior mediastinum and bilateral pleural cavity like our case, bilateral thoracotomy has been considered necessary for adequate drainage of mediastinitis and bilateral empyema thoracis. Recently, minimally invasive VATS was shown to achieve similar results with less morbidity [7, 8]. As drainage of descending necrotizing mediastinitis, we applied the VATS to the patient. We successfully treated this patient by draining the pleural cavities and mediastinum using VATS, although the pancreatic pseudocyst was not drained.

This is the first reported case in the English literature of mediastinitis arising from a pancreatic pseudocyst that was successfully treated by thoracoscopic drainage alone. Because of a lack of recommendations in the published literature, we applied the experience of treating descending necrotizing mediastinitis to our patient. Repeated CT-scanning is suggested for the patient of descending necrotizing mediastinitis if the clinical manifestations are unstable. Second operation may be necessary if there is residual abscess. Fortunately, the patient had an uneventful postoperative course, and follow-up CT-scan one month postoperation revealed complete resolution of mediastinitis.

In conclusion, pancreatic pseudocyst complicated by acute mediastinitis is very rare. Adequate drainage of the mediastinum, broad-spectrum antibiotic therapy, and supportive care for pancreatitis are mandatory. Thoracoscopic surgery can achieve results equivalent to those obtained with the much more invasive approach of thoracotomy.

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eComment: Optimal exposure for debridement of necrotizing mediastinitis and bilateral empyema thoracis

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Chang and Chen's report [1] has added another treatment option to the management of a very challenging clinical problem and we congratulate them. Necrotizing mediastinitis tends to be a fulminant and rapidly progressive disease with high mortality. The variety described by the authors is very rare indeed. Mediastinal pseudocysts are supposedly caused by tracking of pancreatic fluid from the retroperitoneum through diaphragmatic openings, most commonly the esophageal and aortic hiatuses. Being rich in digestive enzymes, bacterial superinfection results in a fulminant necrotizing mediastinitis. The infection is typically polymicrobial in a milieu of necrotizing fasciitis; the synergistic action of aerobic and anaerobic organisms may explain the virulence of the mediastinitis.

The extent of the disease in their patient required mediastinal and bilateral pleural space debridement and not only simple drainage of collections. The need for optimal surgical exposure to accomplish these goals is obvious.

With the experience gained from management of descending necrotizing mediastinitis, conventional surgical techniques would suggest either sternotomy or the clamshell incision since conventional thoracotomy alone does not provide sufficient exposure of both pleural spaces.

Median sternotomy is increasingly used for removal of mediastinal tumors and resection of bilateral pulmonary disease [2]. The limitations of median sternotomy in this setting include the limited access to the posterobasal aspects of the chest cavity, especially on the left side, and the risk of sternal osteomyelitis and sternal dehiscence [2].

The clamshell incision constitutes an improved surgical approach for the management of bilateral pulmonary or combined pulmonary and mediastinal diseases with minimal morbidity [3]. However, this approach is particularly invasive in these critically ill patients and exposes them to the risk of phrenic nerve palsy and sternal osteomyelitis [4]; it is probably ill-advised in the late stages of necrotizing mediastinitis with overwhelming sepsis, profound septic shock and disseminated intravascular coagulopathy.

Video-assisted thoroscopic surgery (VATS) as used by Chang and Chen [1] serves as a very useful and far less invasive alternative in such critically ill patients and is likely to emerge as a dominant tool in the surgical armamentarium for dealing with such challenging clinical problems. At our institution, we recently expanded our service with the introduction of VATS and are therefore, encouraged by the expansion in the indications of this useful tool such as has been demonstrated by Chang and Chen [1].

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