A surprising diagnosis of pancreatitis with pseudocyst associated with sudden massive effusion

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Received March 1, 2011; Accepted March 30, 2011

DOI: 10.3892/etm.2011.248

Abstract. This article describes the case of a 40 year-old man presenting with pleuritic pain on the right side, cough, sputum and sweating symptoms. He had smoked 40 pack-years of cigarettes and consumed 140 ml alcohol/day for 20 years. Breath sounds were diminished at the right lung base. Chest X-ray showed right hemi-diaphragm elevation and heterogeneous opacity on the right inferior zone. Antibiotherapy was commenced for possible diagnosis of pleuropnemonia. The patient developed dyspnea after a few days. Right hemithorax filled with a parabolic shadow was observed on the chest X-ray. Serosanguineous exudate was sampled. Very high levels of amylase and lipase levels were detected in the pleural fluid. Furthermore, magnetic resonance imaging revealed pancreatic pseudocyst near the left diaphragmatic crus. Four thousand milliliters of pleural fluid was drained using an intercostal drain within a 4-day period, and chest symptoms were relieved. Upon follow-up, suitable therapy for chronic pancreatitis was administered, and the patient was stable without any recurrence.

Introduction

Unilateral massive exudate is usually related with a malignant or infectious (parapneumonic or tuberculosis) origin. Subdiaphragmatic diseases, such as hepatic or subdiaphragmatic abscess, acute and chronic pancreatitis, are rarely noted in clinical practice, as shown in Table I (1,2). Herein, we present a patient with symptoms leading to a misdiagnosis of pleuropneumonia.

Case report

A 40 year-old man presented with chest and right shoulder pain, cough, sputum and sweating symptoms, for a period of 1 month. Two weeks earlier, the patient had been examined in the emergency room due to epigastric pain and abdominal distension. He had smoked 40 pack-years of cigarettes and consumed 140 ml alcohol/day for 20 years. The patient complained of delirium-like symptoms due to alcohol withdrawal. His vital signs were normal. Expansion of the right hemi-thorax was delayed. Percussion tone was dull and breath sounds were diminished at the right lung base.

Laboratory analysis showed a high level of hemoglobin (18.2 g/dl), hematocrit (54.2%) and white blood cells ($12.1x10^3/\mu l$). Glucose (190 mg/dl), total bilirubin (2.34 mg/dl), direct bilirubin (0.3 mg/dl) and lactate dehydrogenase (691 U/l) levels were also found to be high. Platelet count ($237x10^3/\mu l$), erythrocyte sedimentation rate (14 mm/h) and the remaining routine biochemical parameters were normal. Pulmonary function tests revealed a restrictive defect. On the chest X-ray the right hemi-diaphragm was elevated and the right costophrenic sinus was obliterated. The right hilus was widened and heterogeneous opacity was observed on the right inferior zone.

Pleuropneumonia most probably due to the aspiration was first considered as a possible diagnosis. Alcohol consumption was restricted, and antibiotics (cefuroxime axetyl 500 mg, p.o., BID) were administered. Diazepam and vitamin B6 were also supplemented in order to control any potential alcohol withdrawal symptoms. A diabetic diet was recommended to sustain the blood glucose level within an acceptable range. A few days later the patient developed severe dyspnea. Common dullness appeared on the right hemi-thorax. Right parabolic opacity was detected on the chest X-ray (Fig. 1). Computed tomography (CT) of the thorax demonstrated massive pleural effusion on the right hemi-thorax. Thoracentesis and biochemical analysis of the pleural fluid were performed (Table II). Serosanguineous exudate was sampled.

High levels of serum amylase and lipase, and a high pleura to serum ratio of these enzymes were detected. The urine amylase level was also very high. Adenosine deaminase (ADA) levels of serum and pleural fluid were unremarkable ruling out tuberculosis. Cytopathological examination of the fluid revealed mesothelial reaction. Pleural biopsy was reported as non-specific pleuritis. On abdominal CT, a right paragastric lesion was detected. Endoscopic retrograde cholangiopancreatography was non-diagnostic. Magnetic resonance imaging (MRI) of the pancreas revealed a pseudocyst close to the left diaphragmatic crus (Fig. 2).

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Key words: massive, pleural, effusion, pancreatitis, pseudocyst

Table I. Causes of unilateral, massive and exudative pleural effusions.

Common causes	Less common causes	Rare causes
Malignancy	Pulmonary embolism	Yellow-nail syndrome (and other lymphatic
Parapneumonic effusions	Rheumatoid arthritis and other autoimmune pleuritis	disorders, lymphangioleiomyomatosis)
Tuberculosis	Benign asbestos effusion	Drugs
	Pancreatitis	Fungal infections
	Post-myocardial infarction	
	Post-coronary artery bypass graft	

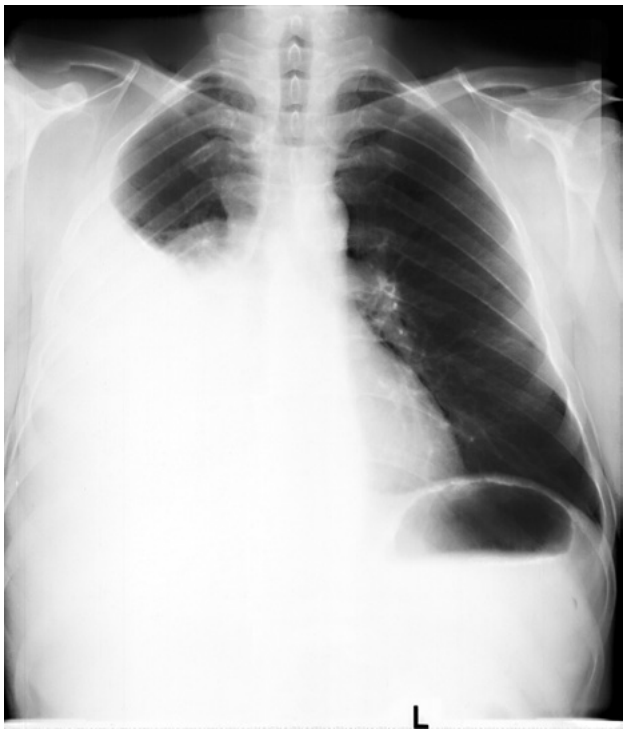

Figure 1. Chest X-ray showing homogenous parabolic shadow on the right lower zone.

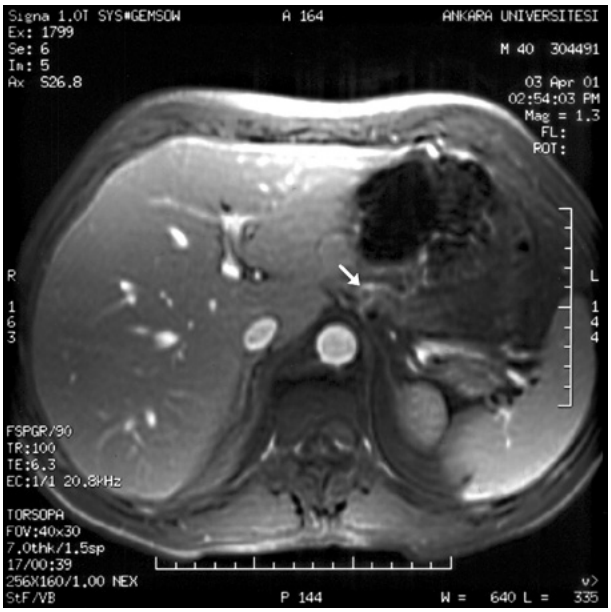

Figure 2. Pseudocyst near the left diaphragmatic crus was noted on the MRI of the pancreas.

Table II. Patient biochemical results of the pleural fluid analysis

Variable	Serum (U/l)	Pleural fluid (U/l)	Urine (U/l)	Pleura/serum ratio
Amylase	369.0	44,900	4,751	>1
Lipase	465.0	173,000	-	>1
ADA	8.3	11	-	>1

ADA, adenosine deaminase.

Four thousand milliliters of pleural fluid was drained through an intercostal drain (Pleurocane®) during a 4-day interval, and chest symptoms were relieved. By antibiotherapy and intravenous feeding, clinical and radiological improvement was achieved. Upon follow-up, the patient was in good health, and his physical examination, laboratory and radiological findings progressively normalized.

Discussion

Pleural effusion associated with pancreatitis is usually symptomatic and inflammatory in nature. It is noted in approximately 3-17% of cases of pancreatitis. Pleural effusion is uncommon in chronic pancreatitis (<1%) and occurs as a consequence of a fistula or pseudocyst (3). Chronic pancreatitis occurs most often in patients with alcoholism (70-80% of all cases). Ethanol is implicated in the secretion of insoluble pancreatic proteins that calcify and occlude the pancreatic duct (2,4). Massive pleural effusion related to pancreatic pseudocyst is very rare and the incidence remains unknown (5). Recurrent pleural effusions may develop. Although effusions are generally on the left, they may also be observed on the right or bilateral side (3,5-8). In chronic pancreatitis, the cause of pleural effusion is attibuted to the direct extension of a pseudocyst across the diaphragm. or by the formation of a fistulous tract between the pancreas and pleural spaces

(9). Although a pleuropancreatic fistula was not documented, pleural effusion may have been the complication of this pseudocyst in this case.

Alcoholic pancreatitis is generally the most common cause of massive pleural fluid. There are several explanations for the pathogenesis of pancreatic duct disruption. Alcohol ingestion induces focal acute inflammation on a single branch of the pancreatic duct system and elicits the protein plug formation. If transient obstruction occurs with protein plugs, pleural collection can be observed due to leakage of the pancreatic fluid. From the retroperitoneal space, it usually moves upward due to the transdiaphragmatic pressure gradient between the abdominal and pleural cavities (10).

Pancreatic pseudocysts are localized collections of pancreatic fluid resulting from disruption of the duct or acinus. Approximately 25% of patients with chronic pancreatitis develop a pseudocyst. Patients should be administered intravenous or jejunal enteral feeding to rest the bowel and minimize pancreatic stimulation, somatostatin infusion and repeated aspiration. The cyst resolves in 70% of cases after 2 or 3 weeks. Persistent leaks to the abdominal cavity require endoscopic stenting of the pancreatic duct or surgery to drain the site of leakage if it is proximal or resection if distal (11,12). In cases with pleuropancreatic fistula, chronic massive and/or recurrent pleural effusions may develop (9,12). Sometimes, chronic pancreatitis may present only with pleural effusions (5). In such cases, CT is recommended to show pancreatic parenchymal atrophy, in addition to dilatation of the pancreatic ducts, calcifications and pseudocysts (3). The pleural fluid due to chronic pancreatitis is usually bloody and contains a high level of amylase, which is predominantly a pancreatic type of isoenzymes (10). Adenocarcinoma of the lung and female genital tract, other solid neoplasms and esophageal perforation or rupture can also be the reason for high amylase levels in the fluid (9). The pancreatic pseudocyst of the present case could be detected by pancreatic MRI. Magnetic resonance cholangiopancreatography, ultrasonography and ERCP are also advocated to scan pleuropancreatic fistula (3,13-15).

In chronic pancreatitis, medical treatment is mainly based on alcohol withdrawal, analgesics and restoration of normal nutritional status. Pain can be decreased, but sometimes endoscopic, radiologic or surgical procedures are required. Surgery is performed in a small group of patients when other therapeutic approaches fail. Insulin is often given for diabetes, while exocrine insufficiency is substituted by gastroresistant microgranule pancreatic extracts (16,17).

Briefly, in the present case, ADA levels in serum or pleural fluid and microscopic examination for acid fast bacilli or other bacterias ruled out tuberculosis and empyema. There was no sign reflecting malignancy on thorax or abdominal CT and MRI. The patient denied any trauma or accident during the last 2 weeks. Radiological findings were prominent for pancreatic pseudocyst formation. High amylase and lipase levels detected in serum and pleural fluid indicated pancreatic inflammation. In conclusion, chronic pancreatitis, including a pseudocyst, should be considered in patients developing massive pleural effusion in case of alcohol abuse. Although it is extremely less common, chronic pancreatitis including pseudocyst should be included in the list of differential diagnosis for massive pleural effusion.

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