Pyopneumopericardium due to esophago-pericardial fistula in patient with tuberculous pericarditis

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Tuberculous pericarditis may rarely make perforation of the lower esophagus and cause an esophago-pericardial (EP) fistula followed by purulent pericarditis. Most of the fistula is an acute illness associated with characteristic clinical findings, extremely high mortality, early recognition and prompt management of the lesion is keystone to improve the clinical course. Medline search revealed that most of the reported cases of esophageal fistula were secondary to ingestion of foreign object, gastrointestinal (GI) ulcers and esophageal malignancy. We report a case of one of the relatively few patients who survived a pericardial complication of pericardial tuberculosis (TB) that resulted in formation of esophageal fistula and purulent pericarditis in which early diagnosis and treatment including pericardiocentesis with fully course of antibiotic followed by a well-planned operative course of the fistula substantially improved the outcome.

A 23 year-old Nepali male patient presented with history of fever with chills for 5 days duration. There is a history of productive cough with atypical chest pain and shortness of breath at rest but neither hemoptysis, vomiting nor dysphagia; he had no past medical illness. Physical examination revealed an acute ill appearance patient with a temperature of 38^0C, pulse rate 150/minute, respiratory rate 24 and systolic pressure is 110. Jugular venous pressure (JVP) was not elevated, his heart sounds were regular and without murmur and there was bibasilar crepitation on chest examination, his abdomen was distended with guarding on right upper quadrant (Rt.UQ) and a positive shift dullness suggestive of ascites, there was no edema of the extremities. White cell count was approximately 20,000/mm^3 with neutrophils (78.8%), lymphocytes (13.2%) and monocytes (7.3%); hemoglobin level is approximately 12.5 and platelets count approximately 156,000/mm^3, international normalized ratio (INR) was 2.5 with Ptt 27, Pt 45.3, alkaline phosphatase (271 u/l), alanine aminotransferase (2712u/l), aspartate aminotransferase (2712) with albumin (31 g/l), total protein of approximately 65 g/l, serology of hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) and purified protein derivative (PPD) tests were negative. The electrocardiogram (ECG) showed sinus tachycardia while plain radiographic of the chest revealed left lower zone opacity with air-fluid level in the pericardium, computed tomography (CT) of the chest and abdomen confirmed the presence of a large pericardial effusion, bilateral pleural effusion and mild consolidation in the left lower lobe with no obvious pneumomediastinum is seen. The liver shows evidence of heterogeneous enhancement with mild fluid noted in the abdomen and pelvis. Echocardiogram was carried out and revealed massive pericardial effusion with air bubbles floating in the effusion, impending cardiac tamponade with hydropneumopericardium. According to ECHO findings, the patient was carried out with pericardiocentesis and yielded 300 cc pus with protein 59 g/l, glucose 0.3 mmol/l, lactate dehydrogenase (LDH) 3361, red blood cell (RBC) 31150/ul and pH 6.5; while cell count and differential revealed white blood cell (WBC) 44800/ul, neut 96%, lymph 3% and gram stain with culture showed *Staphylococcus aureus* and *Streptococcus salivarius* another sample was send for acid fast bacilli (AFB) smear and culture. The patient started on cloxacillin approximately 2 gm intravenously every 6-hours with gentamicin approximately 80 mg intravenously every 8-hours. Echocardiogram was repeated 12 days after revealed thick pericardium with early calcification in the posterior wall, trivial pericardial effusion and evidence of early constrictive pericarditis. On the third week of admission, he underwent partial pericardiectomy for persistent purulent pericarditis and early constrictive pericarditis. Biopsy results of the pericardium showed thick pericardium with marked fibrosis, focal foreign body giant cell reaction, the nature of foreign body appears to be vegetable fibers, no well formed granuloma or caseation was seen with no evidence of malignancy seen. According to this result, GI contrast study was carried out, which demonstrates evidence of leak from the lower esophagus

Figure 1 - Gastrografin swallow after ingestion of omnipaque showing irregularities of the left lateral aspect of the distal portion of the esophagus with leakage of contrast, the tract can be seen reaching level of the bifurcation of the left main bronchus.

with fistulous communication and pleural cavity (**Figure 1**). Endoscopy was also performed which revealed esophago-pleural pericardial fistula, 4 days later, the patient became sick with dyspnea, urgent operation through left thoracotomy was carried out with drainage and laparotomy with jejunostomy. The postoperative course was stable and the patient underwent stent insertion for the fistula under fluoroscopy guidance, repeat gastero-esophagogram showed free passage of barium column from esophagus to the stomach with no leakage. The jejunostomy tube was removed and the patient was discharged on the 120th hospital day. A follow up of the AFB smear and culture results from pericardial fluid reveals AFB of mycobacteria tuberculosis complex but unfortunately, the patient went home before getting this result.

Esophago-pericardial (EP) fistulas are uncommon findings and are of 10 associate unfavorable outcomes, a search of the literature revealed 60 cases of acquired EP fistula and are in hospital mortality approximately 83%. Benign esophageal conditions are the most common causes such as esophageal ulcer, reflux esophagitis esophageal diverticula, achalasia, ingestion of a foreign object, tuberculosis and account for approximately 77% of the cases while esophageal malignant tumor constitute approximately 23% of all reported cases of EP fistula. The most commonly associated symptoms or signs are precordial pain, dyspnea, fever and the presence of audible systolic murmur over the pericardium similar to the splashing of a waterwheel, EP fistulas have also manifested as pericarditis due to the development of purulent pericarditis and it is invariably fatal with usually complicated cardiac tamponade; chest x-ray may visualize a fluid level in the pericardial cavity and cardiomegaly but the best study to diagnose this condition remains the esophagogram with water soluble contrast while echocardiography is useful in the assessment of the presence of the pericardial effusion and hemodynamic measurements at the bedside. In this situation, such as the exact diagnosis of EP fistula could be delayed as the patient described here is atypical in that history, review of system or physical examination, the initial non-invasive studies suggested possibility of infectious process such as leukocytosis but blood cultures were negative, CXR revealed the fundamental findings of pneumo-pericardium and CT of chest with ECHO, confirmed the presence of pericardial effusion and pericardiocentesis identified purulent pericardial fluid which mostly occurred as complication of esophageal fistula. In our patient, the cause of esophagal-pleural-pericardial was vague, as this case did not present the distinct past history of ingestion fish bone, TB or specific symptoms such as dysphagia. We did not suggest the esophageal injury at admission and did not earlier perform esophagogram or fiber-optic esophagoscopy that could confirm the lesion; esophagoscopy was performed for the first time after biopsy results of pericardiotomy to determine the site of the fistula. No contrast dye was apparent in the pericardium of our patient but the fistula was identified with radiographic contrast studies; the fistula was then repaired by stent insertion under guidance of fluoroscopy. The result of AFB smear from pericardial fluid was negative but the culture of the pericardial fluid grows mycobacterial tuberculosis in spite of the absence of Granuloma from biopsy of the pericardium and negative PPD test. In conclusion, acquired EP fistula is rare and often fatal condition risk factors; and etiologies are often multifactorial, the diagnosis is often delayed due to the lack of specific signs and symptoms. Of the 60 previously reported cases, only 10 patients have survived. We described a case of purulent pericarditis that resulted from formation of an acquired EP fistula in a patient with TB pericardial effusion. A radiographic contrast study revealed the site of fistula, the EP fistula was closed by stent insertion and our patient had a good final result.

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