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Pericardial effusion complicated by cardiac tamponade in tubercular pericarditis. A case report

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Abstract

Pericardial effusion is a fluid in the space between the heart and the pericardial sac. If the fluid accumulates rapidly in the pericardial space as in the chest trauma, this fluid can compress the heart (cardiac tamponade) and cause circulatory failure. With the slow accumulation of fluid, the pericardial sac will stretch to accommodate the fluid. However if the fluid continues to accumulate, tamponade will eventually occur. This is a dire emergency situation requiring immediate aspiration of pericardial fluid. Cardiac tamponade occurs after sudden and/or excessive accumulation of fluid in the pericardial space that restricts appropriate filling of the cardiac chambers disturbing normal hemodynamics and ultimately causing hypotension and cardiac arrest. Therefore, it is a life threatening condition that must be diagnosed as soon as possible for correct treatment and management.

Key Words: Cardiac tamponade, CATH-LAB, echocardiography, emergency pericardiocentesis, pericardial effusion,

Introduction

Pericardial effusion is defined by an increase in the physiological amount of fluid within the pericardial space. Signs and symptoms of large pericardial effusion include tachycardia, raised jugular venous pressure, orthopnea, pulsus paradoxus, and pericardial rub. Ultimately resulting in hypotension and bradycardia before cardiac arrest. Echocardiography remains the gold standard imaging technique for diagnosis and evaluation of pericardial disease. Echocardiographic evaluation of pericardial tamponade are- (i) quantity of pericardial fluid (ii) collapse of cardiac chambers (iii) respiratory variation of the ventricular diameters (iv) inferior venacava collapsibility

and (v) flow pattern in atrioventricular valves. There are many causes of pericardial effusion, Tuberculosis being the most common. However, tamponade rarely develops owing to slow rate of accumulation of pericardial fluid. Antitubercular treatment is all that is necessary. Diagnostic pericardiocentesis is necessary to ruleout the cause of asymptomatic pericardial effusion until unless emergency therapeutic pericardiocentesis is necessary for patient with cardiac tamponade.

Case report

A 53 years old female presented referred from nearby hospital with the complain of shortness of breath since 3 days, earlier it used to occur while walking fast or climbing ladder that is around 2 months. Later on Shortness of breath increased to the point that she could not lie flat since two days. She presented to our emergency department when she could not lie even in propped up position due to shortness of breath, she feels like she is going to die due to dyspnea. She had a history of weight loss since few months but denied past history of medical or surgical conditions.

On physical examination, she was conscious, oriented but could not speak in full sentences. Pulse 112 bpm but very feeble. Respiratory rate was 35/min. Blood pressure 60/40mmHg. She was diaphoretic. JVP seemed raised. Chest auscultation revealed clear lungs field. Heart sounds were muffled. Outside X-ray showed massively enlarged cardiac silhouette. ECG showed sinus tachycardia @112bpm with electrical alterans. Urgent echocardiography screening at ER showed a large pericardial effusion with signs of pericardial tamponade (pendulus heart, right ventricular collapse in diastole as well as right atrial collapse but could not take the parameters because of patient in severe dyspnea. Routine blood sample sent for analysis which later came normal.

Patient was immediately shifted to CATH-LAB for emergency pericardiocentesis. An emergency pericardiocentesis was performed by a subxiphoid approach in propped up position using echocardiographic guidance. After aspirating about 50ml of serous fluid, she feels comfortable, blood pressure went to 90/60mmHg. Thereafter Pigtail was inserted under fluoroscopic guidance and aspirated around 950ml of serous fluid. Her pulse return back to 90bpm, blood pressure to110/70mmHg, RR to 18/min and no more visible increased JVP. Pericardial fluid sent for analysis. She was then shifted to CCU with pigtail in situ. After 6hours, again 650ml of pericardial fluid aspirated. Next day morning, again around 200ml of fluid aspirated thereafter pigtail got removed as there seems no more fluid in the pericardial space on echocardiography. Besides ADA of 102 with lymphocyte count of 90 and other pericardial fluid report came normal including acid fast bacilli stain. Her ESR was 110/hour, CRP 45 and TSH 2.9. With above pericardial fluid report and her clinical history, we started ATT and after two days of ATT, she got discharged. She was under regular follow up and completed 6 months regimen of ATT and she is doing well now.

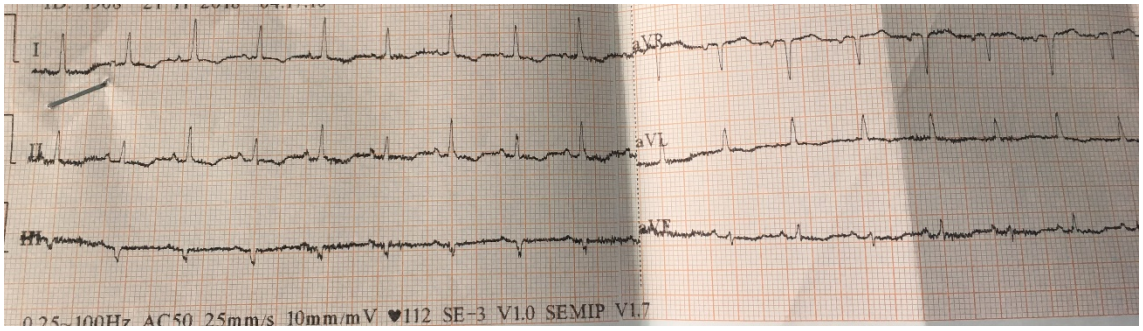

Fig 1 ECG showing Sinus tachycardia @112 bpm with electrical alterans.

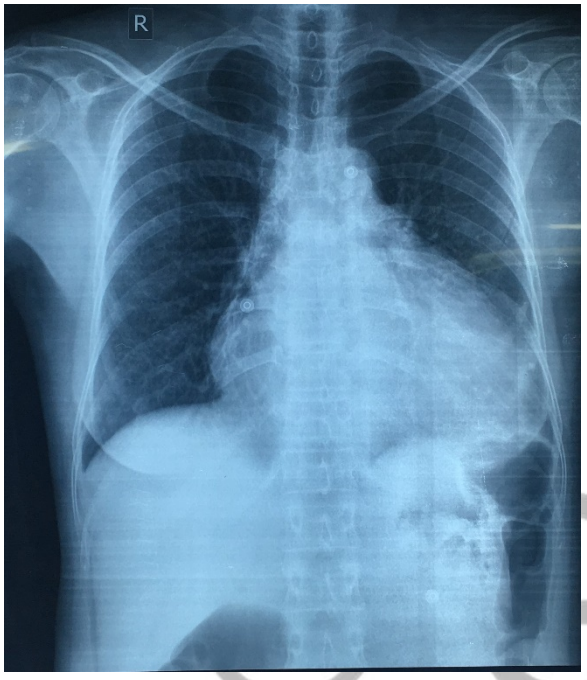

Fig 2 X-ray showing enlarged cardiac silhouette.

Fig 3 Aspirated pericardial fluid.

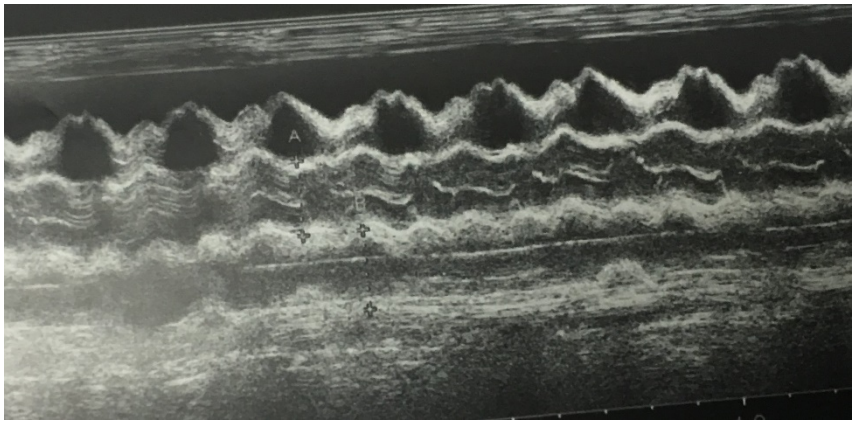

Fig 4 Echo in M mode showing right ventricular collapse in diastole

Fig 5 Echo showing large pericardial effusion and right atrial collapse.

Discussion

Pericardial effusion is a well-known complication of tuberculous pericarditis. The most severe complication of tubercular pericarditis is large pericardial effusion, sometime in tamponade. The key to urgent treatment was the fact that the clinicians were aware of this possible diagnosis which was confirmed with bedside echocardiography. Emergency pericardiocentesis was possible using echocardiography to guide the insertion of the aspirating needle. Prognosis is poor once the condition has progressed to cardiac tamponade and early diagnosis and treatment of TB pericarditis may prevent this potentially fatal complication. Tamponade occurs when the fluid in the pericardial space accumulates faster than the pericardial sac can stretch and so cause high pressure compressing the heart and preventing the heart from expanding fully. The classical signs of cardiac tamponade (also called Beck's triad) are hypotension, jugular venous distension and muffled heart sounds. Hypotension results from decreased cardiac output, jugular venous distension results from impaired venous return to the heart and muffled heart sounds are due to large pericardial fluid. There are other physical signs that may indicate cardiac tamponade. On inspiration, the central venous pressure (JVP) would normally fall but with tamponade this rises. Pulsus paradoxus is the finding of a fall in the systolic blood pressure of more than 10mmHg when the patient inspires.[1]

Tuberculous pericarditis, caused by mycobacterium tuberculosis, is found in approximately 1% of all autopsied cases of TB and in 1-2% of instances of pulmonary

TB. It is most common cause of pericarditis in Africa.[2] In one series from the Western Cape Province of South Africa, tuberculous pericarditis accounted for 69.5% of cases referred for diagnostic pericardicentesis.[3]The incidence of tuberculous pericarditis in sub-saharan Africa is increasing as a result of human immunodeficiency virus epidemic and this trend is likely to appear in other parts of the world. [4,5] Risk of death was higher in patients with HIV infection, old age and co-existing pulmonary tuberculosis.[6,7] Pericardial fluid has a poor yield of about 2% of acid fast bacilli on smear examination but TB culture is positive in 38-56%. [8] A raised lymphocyte count, Adenosine deaminase, protein and lactate dehydrogenase levels in the pericardial fluid are useful indicators of tubercular pericarditis.[9]In the absence of alternative diagnosis, patients should be started on empirical anti-tuberculosis treatment irrespective of test result.[5]

Patient diagnosed with TB pericarditis should be promptly started on anti-TB therapy using the standard 4 drugs regimen. Pericardiocentesis is a life-saving procedure for patients with cardiac tamponade and as in our patient only a small volume of aspirate (50ml) may have a dramatically beneficial effect. It is generally recommended that patients with TB pericarditis are also prescribed steroids although there are only few clinical trials to support this recommendation.[3]The recommended dose is 60mg prednisolone daily for adults and 1mg/kg/day for children with gradual withdrawal after 2-3 weeks.[9,10]

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