

Cardiac tamponade - An unusual presentation of Pulmonary Adenocarcinoma

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ABSTRACT

Cardiac tamponade as the first presenting symptom of metastatic malignancy is very rare. A 45 year male presented with dyspnea and productive cough. Chest X-ray, echocardiogram and ECG showed pericardial effusion with cardiac tamponade. Pericardial fluid cytology revealed metastatic adenocarcinoma probably from lung. CT scan of chest showed collapsed lower lobe of left lung with a 2.4x2cm non enhancing hypodense lesion, along with enlarged mediastinal lymph nodes confirming the cytological diagnosis of pulmonary carcinoma.

Keywords: cardiac tamponade, cytology, pulmonary adenocarcinoma

INTRODUCTION

Cardiac tamponade a life threatening emergency, is rarely the first presenting symptom in malignancies.^{1,2,3} Pericardial involvement, with subsequent effusion and cardiac tamponade, may be a metastatic complication of advanced cancers such as carcinoma lung and breast, leukemia and lymphomas. These neoplastic effusions are usually asymptomatic.¹ There are very few case reports of cardiac tamponade as initial manifestation of pulmonary adenocarcinoma. Here we report a case of pulmonary adenocarcinoma presenting as cardiac tamponade.

CASE HISTORY

A 42 year male, cotton mill worker, presented with history of breathlessness and productive cough of 8 months duration. The symptoms aggravated in the last 8 days. Examination revealed tachycardia, systolic hypotension, pulsus paradoxus of 20 mm Hg, raised juglar venous pressure (JVP), crepitations and rhonchi more on right side, and reduced air entry on left lung fields. Cardiac sounds were reduced in intensity.

Investigations: Chest X-ray showed cardiomegaly (figure-1a). An electrocardiogram (ECG) showed low voltage complexes; and echocardiography showed large pericardial effusion with right atrial and ventricular collapse and trivial mitral valve regurgitation. Left ventricular systolic function was adequate. Based on the clinical and echocardiography findings the patient was diagnosed to have cardiac tamponade. Pericardiocentesis was performed and 1000ml of hemorrhagic fluid aspirated. The cytological examination of the fluid showed neoplastic epithelial cells and clusters of reactive mesothelial cells in a hemorrhagic background. The neoplastic cells were arranged in cohesive three dimensional clusters with smooth borders, papillae and acinar formations. These cells were polygonal having moderate amount of homogenous cytoplasm with cytoplasmic vacuolations. The nuclei were round to oval, medium to large in size, with fine to coarsely granular chromatin and variably conspicuous nucleoli [figure-2a, 2b]. The neoplastic cells showed PAS positivity (figure-2c). Based on these features diagnosis of metastatic adenocarcinoma, probably arising from the lung was offered. Later patient was investigated for site of primary malignancy. Ultrasonography of

abdomen was normal; there were no enlarged lymph nodes or mass lesion in the abdomen. CT scan of chest revealed large pericardial effusion, moderate left pleural effusion and partial collapse of left lower lobe of lung with a 2.4x2cm non enhancing hypodense lesion within it. Mediastinal lymph nodes were enlarged. The features were suggestive of pulmonary carcinoma.

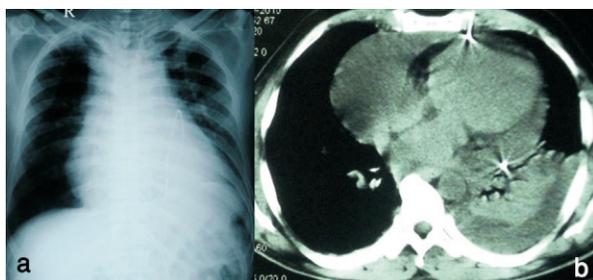


Figure 1: (a) Chest X-ray showing cardiomegaly, (b) CT scan chest showing pericardial effusion and a 2.4x2cm non enhancing hypodense lesion within the collapsed lower lobe of left lung

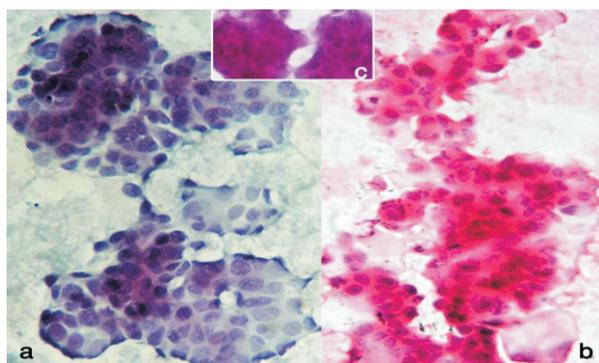


Figure 2: (a) & (b) showing the tumour cells in cluster and papillae with abundant vacuolated cytoplasm, eccentric nucleus (H&E x400 & Pap x400), (c) cells showing PAS positivity (PAS stain x400)

DISCUSSION

The vast majority of tumours affecting heart are of metastatic rather than of primary origin.⁴ Approximately 10% of the patients with terminal malignancy have cardiac involvement; out of these 8.5% have pericardial involvement.^{2,5} Neoplastic pericarditis can present as acute pericarditis, pericardial effusion, effusive-constrictive pericarditis or cardiac tamponade. Neoplastic effusions are usually

asymptomatic. Cardiac tamponade as the initial manifestation of malignancy is very rare.⁶ Most often the underlying malignancy is pulmonary carcinoma (37%), breast carcinoma (22%), leukaemia and lymphoma (17%), sarcomas (3.5%) and melanoma (3%).^{1,6} Isolated cases of cardiac tamponade occurring as an initial manifestation of malignant tumours of the thymus, kidneys, stomach, thyroid and oesophagus have been reported.¹ Non-tumour related causes like hypoalbuminemia from cachexia, uraemia, idiopathic, infectious pericarditis and radiation or chemotherapy related pericarditis should be considered in the differential diagnosis.^{1,6}

Pericardial involvement as a result of metastatic lung diseases is usually asymptomatic. Tumour implantation on serosal surfaces leads to augmented fluid production and exudation. In addition, epicardial lymphatic and venous obstruction by tumour cells causes further increase in hydrostatic pressure and hence fluid accumulation.⁶

The most common symptoms reported in patients with cardiac tamponade due to malignancy were dyspnoea (79%), cough (47%), chest pain (26%), orthopnea (26%) and dysphasia (18%). The physical signs commonly encountered were tachycardia (50%) and signs of systemic venous congestion, pulsus paradoxus and pericardial rub were present in 30% and 12% cases respectively.^{1,6}

Right atrial or ventricular collapse on echocardiography, low voltage ST segment changes and electrical alternans on ECG suggest cardiac tamponade.¹

Ben-Horin S et al., studied 173 cases of pericardial effusions of which 58 cases were of neoplastic aetiology. Among these, 45 cases had known malignancy. Pericardial disease was the presenting feature in 13 cases.⁷ Petcu PD et al., studied 21 cases of pericardial effusion with cardiac tamponade, among which four cases were of neoplastic etiology. Out of these four

cases one case presented as cardiac tamponade as the initial manifestation of malignancy.⁸

The sensitivity of detecting malignant cells in the pericardial fluid has been variable in different studies, ranging from 54% to more than 90%. These differences may be due partly to the amount of fluid examined, number of pericardiocentesis and expertise of the examiner.⁷

Sometimes it becomes difficult to differentiate between reactive mesothelial cells and malignant cells. Very rarely the cytological examination may establish the exact origin of malignant cells from the pericardial fluid.⁸ In the present case cytological examination with special stain helped to establish the primary site of malignancy, which was later detected by the CT scan.

Cardiac tamponade implicates advanced disease. The median survival of these patients is reported to be between 7 days to 12 months following initial diagnosis.¹

CONCLUSION

Cardiac tamponade is a life threatening emergency. It is an uncommon complication and a rare initial presenting feature of pulmonary malignancy. The cytological examination of the pericardial fluid may help to establish the origin of primary malignancy and confirm the diagnosis of malignant cardiac tamponade

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