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CASE REPORT

Unusual presentation of a young man with disseminated tuberculosis and right ventricular mass

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SUMMARY

We report a 22-year-old man who presented to the emergency department with worsening shortness of breath and chronic fever for 2 months. Physical examination was unremarkable except for raised jugular venous pressure and palpable liver. Echocardiogram showed a large right ventricular mass causing obstruction at tricuspid valve. A subsequent chest CT scan confirmed the presence of a large mass in the right ventricle. There were multiple enlarged lymph nodes and consolidation in the right upper lobe. Diagnosis of disseminated tuberculosis (TB) was made and later confirmed by histopathology of lymph node biopsy along with positive sputum culture for acid-fast bacilli. Remarkable recovery was observed on antituberculous therapy, with complete disappearance of the cardiac mass on echocardiogram, at 1-year follow-up. Although unusual and rare, myocardial involvement as a large mass should be kept in mind while treating patients with disseminated TB.

On clinical examination, he was in some respiratory distress but was haemodynamically stable with raised JVP, clear chest and normal precordial examination. Abdominal examination revealed palpable liver while rest of the clinical examination was unremarkable.

INVESTIGATIONS

Biochemical and haematological investigations were normal. Chest X-ray showed right upper lobe fibrosis with patchy infiltrates, while ECG showed a right bundle branch block. A transthoracic echocardiogram was performed which revealed a large echogenic density in the right ventricle causing obstruction at tricuspid valve and almost obliterating the right ventricular (RV) cavity (figures 1–3 and videos 1–4). Right atrium and ventricle were dilated, while left ventricle was normal in size with normal systolic function. In view of the echocardiographic findings, a neoplastic lesion was suspected while the other possibility was a thrombus. Cardiac

BACKGROUND

This is a rare case of cardiac tuberculoma in a young patient with disseminated tuberculosis (TB). Lungs are the most common site for tuberculous involvement. Extrapulmonary TB account for only 15–20% of all cases of TB. Tuberculous involvement of myocardium is even rarer.¹

Despite the high prevalence of TB, no case of myocardial TB has ever been reported from Pakistan. Our case highlights the rare occurrence of myocardial TB as a cardiac mass. Cardiac tuberculoma should be considered to be a differential of cardiac mass lesion, especially in an endemic area. Given a prompt diagnosis, these patients can be successfully treated with standard antituberculous therapy.

CASE PRESENTATION

A 22-year-old man presented to the emergency department with symptoms of worsening shortness of breath, right hypochondrial pain and low-grade fever for past 2 months. Shortness of breath was progressively worsening, initially occurring on exertion and later even at rest. Right hypochondrial pain was localised with no relation to meals. Fever was up to 100°F and was associated with chills and rigours; it was continuous, with evening rise, but no night sweats. There was no history of chest pain or haemoptysis. His appetite had decreased with significant weight loss in last 2 months. The medical history was insignificant with no history of TB contact.



Figure 1 Two-dimensional transthoracic echocardiogram in parasternal long-axis view showing an echogenic mass in right ventricular cavity as depicted by an arrow.



Figure 2 Two-dimensional transthoracic echocardiogram in short-axis view showing an echogenic mass causing obstruction at tricuspid valve (arrow).



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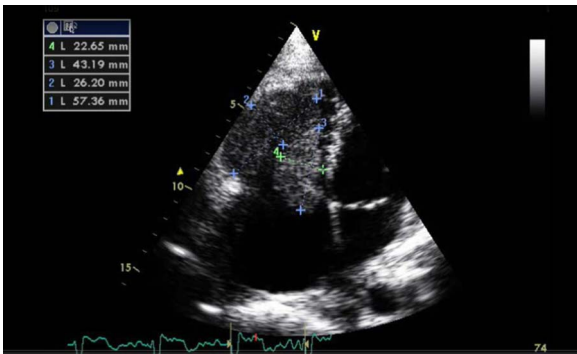
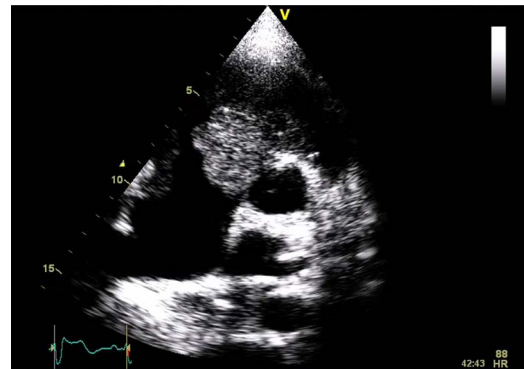
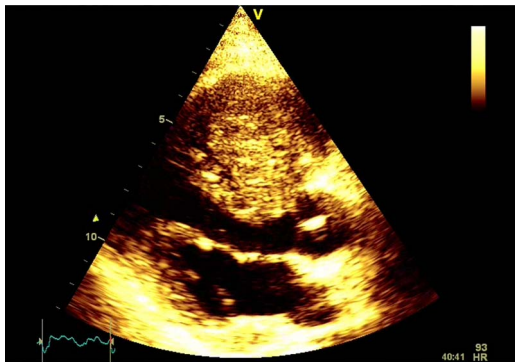


Figure 3 Two-dimensional transthoracic echocardiogram in apical four-chamber view showing RV mass measuring 43×26 mm in size. RV, right ventricular.



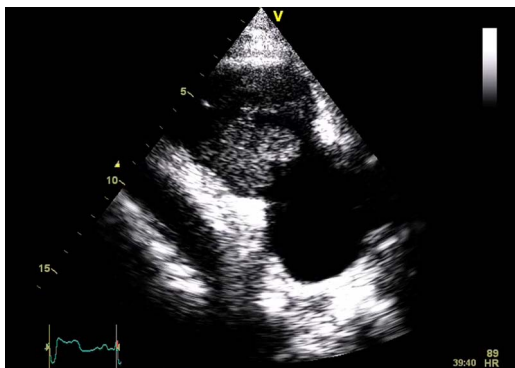
Video 3 Two-dimensional transthoracic echocardiogram in short-axis view at aortic valve level showing an echogenic mass causing obstruction at tricuspid valve.



Video 1 Two-dimensional transthoracic echocardiogram in parasternal long-axis view showing an echogenic mass in right ventricular cavity.



Video 4 Two-dimensional transthoracic echocardiogram in apical four-chamber view showing an echogenic mass in the right ventricular cavity.



Video 2 Two-dimensional transthoracic echocardiogram in RV inflow view showing an echogenic mass in right ventricle causing an obstruction at tricuspid valve. RV, right ventricular.



Figure 4 CT scan chest axial view showing a large mass involving the right ventricular cavity (asterisk).

MRI was advised but could not be performed, as the patient was unable to lie flat and hold his breath.

A chest CT scan with contrast was performed that showed a large filling defect measuring 83×56 mm mainly involving the right ventricle and extending up to the main pulmonary trunk (figure 4). Consolidation was also seen in the right upper lobe with patchy infiltrate in the apical segment of right lower lobe. There were multiple enlarged lymph nodes in bilateral axilla, largest measuring 1.4 cm in left axilla. Multiple enlarged lymph nodes were also observed in abdomen, mesenteric region, and mild ascites was also noted.

The patient declined from surgical resection of the RV mass; however, an ultrasound-guided biopsy of the axillary lymph node was performed. The histopathology showed nests of lymphoid cells, epithelioid granulomas and islands of necrosis that confirmed TB (figure 5). Though the sputum smear for acid-fast bacilli was negative, but interferon- γ released assay (IGRA) was positive for TB and later the sputum culture was

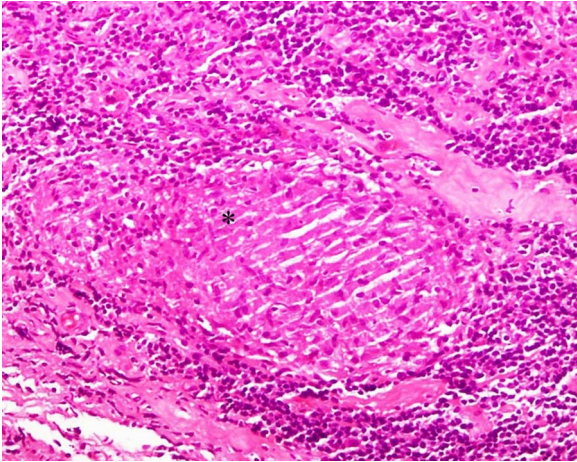


Figure 5 Histopathology image of axillary lymph node biopsy shows nests of lymphoid cells, epithelioid granuloma (asterisk) and island of necrosis.

also reported positive for *Mycobacterium tuberculosis* that was sensitive to first-line antituberculous therapy.

DIFFERENTIAL DIAGNOSIS

Possibility of a neoplastic lesion or a thrombus was initially suspected. However, in view of multiple enlarged lymph nodes, pulmonary infiltrates, positive histopathology of lymph node and sputum culture for *M. tuberculosis*, final diagnosis of cardiac tuberculoma was made, and the patient responded well to antituberculous therapy as observed on follow-up echocardiograms.

TREATMENT

Initially, the patient was started on therapeutic anticoagulation on the suspicion of RV thrombus, but stopped after a month, once the biopsy and clinical features were suggestive of tuberculoma. First-line antituberculosis therapy (ATT) was started and continued for 1 year. The patient tolerated the ATT and showed clinical improvement on routine follow-up visits.

OUTCOME AND FOLLOW-UP

Follow-up echocardiogram after 3 months of therapy showed moderate resolution of RV mass whereas at 1 year of therapy, the echo showed complete disappearance of mass, hence the repeat CT scan of chest was not considered (figures 6–8 and videos 5 and 6).



Figure 6 Two-dimensional transthoracic echocardiogram in parasternal long-axis view at follow-up visit a year later shows complete resolution of right ventricular mass.

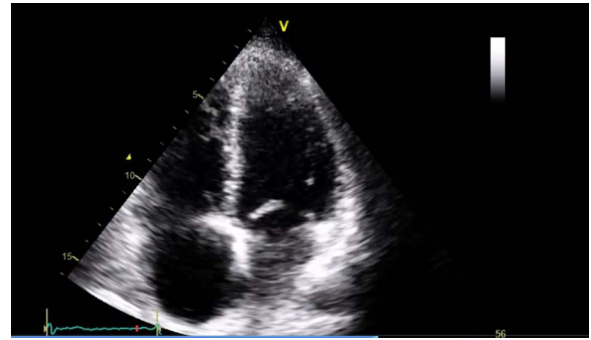


Figure 7 Two-dimensional transthoracic echocardiogram in apical four-chamber view at follow-up visit shows complete resolution of right ventricular mass.

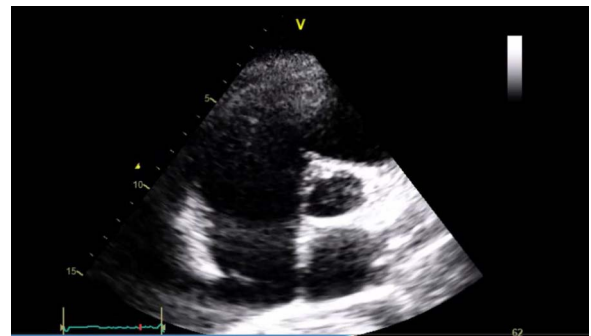
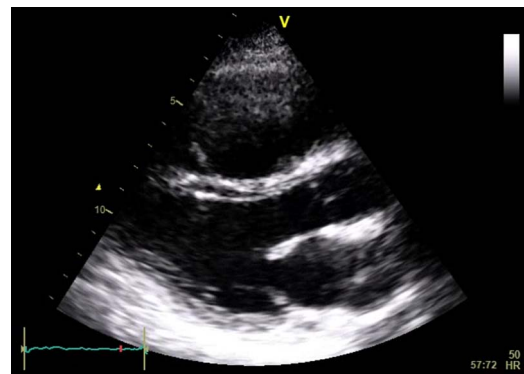
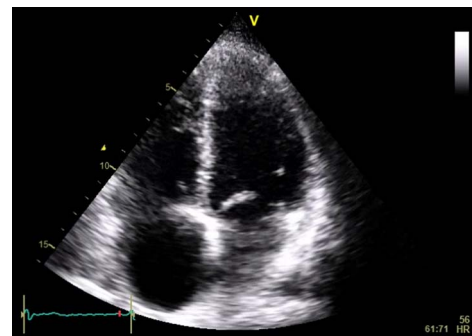


Figure 8 Two-dimensional transthoracic echocardiogram in short-axis view at follow-up visit shows the absence of right ventricular mass.

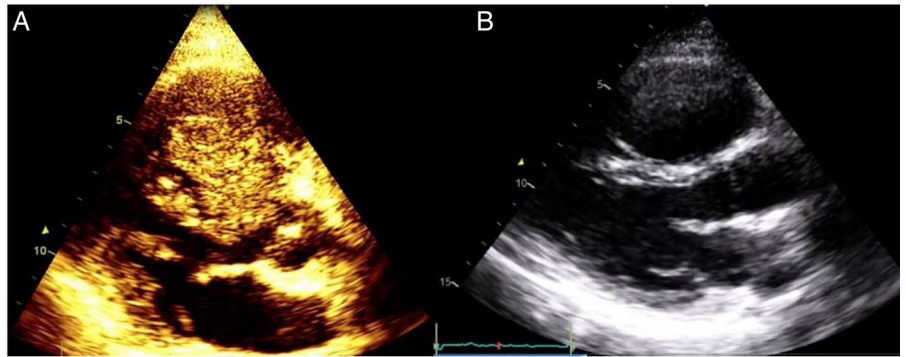


Video 5 Two-dimensional transthoracic echocardiogram in parasternal long-axis view at follow-up visit a year later shows complete resolution of right ventricular mass.



Video 6 Two-dimensional transthoracic echocardiogram in apical four-chamber view at follow-up visit shows complete resolution of right ventricular mass.

Figure 9 Two-dimensional transthoracic echocardiogram in parasternal long-axis view. (A) Right ventricular mass. (B) Resolution of mass.



DISCUSSION

TB presenting as an intracardiac mass is an unusual finding. Extrapulmonary TB is common in endemic areas like Pakistan and has been reported extensively.²

To the best of our knowledge, this is the first case of cardiac tuberculoma which is being reported from Pakistan.

Intracardiac TB was first described by Morgagni in 1761.³ Prior to introduction of antituberculous therapy, cardiac tuberculomas were reported on postmortem examination in <0.3% of cases.

Cardiac tuberculomas are rare and often observed in right heart chambers, particularly in the right atrial wall. They are usually well circumscribed and sharply demarcated from the surrounding parenchyma.^{3 4}

Several mechanisms may explain the involvement of heart in active TB. The involvement of the myocardium could be the result of extension of the pericardial TB, infiltration from the mediastinal lymph node or haematogenous dissemination.⁵ In our patient; it was probably secondary to haematogenous spread, due to the presence of disseminated TB.

Clinically, myocardial TB may be silent or can present with varied manifestations, including tachyarrhythmias, complete atrioventricular block, RV outflow tract obstruction, superior vena cava obstruction, left ventricular aneurysm and sudden cardiac death. Involvement of the right atrium can cause atrial fibrillation or flutter.⁶ Similarly, fatal ventricular tachyarrhythmias can occur in patient with RV involvement.⁷ In our patient, the RV mass resulted in tricuspid valve obstruction with signs of right heart failure, that is, raised JVP and palpable liver.

Transthoracic echocardiography can reliably identify the mass and its location while transesophageal echocardiography frequently adds important information to the assessment of mass lesions. Owing to better tissue characterisation, cardiac MRI can help to differentiate between various cardiac masses. It can show characteristic T2 shortening in tuberculous involvement, similar to that seen in intracranial tuberculomas.⁸ However, these findings can be nonspecific, and the differential diagnosis in such cases includes neoplastic lesion and thrombus.⁹

The gold standard method for the diagnosis is culture isolation of the organism or characteristic finding on histopathology. In our case, the patient refused from endomyocardial biopsy. The final diagnosis of TB and possible tuberculoma was made on positive sputum culture and histopathology of axillary lymph node biopsy.

The treatment of cardiac tuberculoma is antituberculous therapy. The therapy was continued for 12 months in our patient to prevent any residual disease. This resulted in complete recovery. There are case reports of myocardial tuberculoma in which antituberculous therapy was continued for

12 months.^{7 10} Surgery is usually indicated when cardiac tuberculoma causes complications such as superior vena cava obstruction, myocardial rupture with pseudoaneurysm, aortic insufficiency, arrhythmias, and in case of large tuberculoma where pharmacotherapy is inadequate.¹¹

In our case, complete resolution of the mass on antituberculous therapy confirmed it to be a tuberculoma (figure 9). Complete recovery of the patient and resolution of cardiac involvement on antituberculous therapy have also been reported in the literature.¹²

Learning points

- ▶ Although cardiac tuberculomas are rare, they should be considered as a differential in patients presenting with cardiac mass, particularly in endemic areas for tuberculosis.
- ▶ In such patients, transthoracic echocardiography plays a superior role for simple and early diagnosis.
- ▶ Diagnosis should be prompt as they can present with tachyarrhythmias, complete atrioventricular block, right ventricular outflow tract obstruction, superior vena cava obstruction, left ventricular aneurysm and even sudden cardiac death.
- ▶ Given a quick diagnosis, these patients can be successfully treated with standard antituberculous therapy with complete regression of mass on follow-up echocardiography.

Contributors SH did the literature search; gathered history; involved in collection of data, images and videos; drafted the manuscript; analysed and formatted the case. FATS edited the manuscript and involved in critical revision and supervision of the manuscript. MQM is the primary physician who directly involved in care and the final revision of the manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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