

Giant Left Atrium Disguised as Right-Sided Pleural Effusion



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INTRODUCTION

Rheumatic heart disease (RHD) is a complication of acute rheumatic fever that results from untreated streptococcal pharyngitis infections. RHD-related morbidity and mortality have decreased significantly in developed countries in the past couple of decades because of advances in early recognition and management of acute rheumatic fever. RHD is still a significant cause of cardiovascular-related mortality in some parts of the world. One of the most common complications of RHD is chronic mitral valve disease. In some patients this leads to the dilation of the left atrium, which may go undiagnosed. Patients may experience symptoms such as cough, chest pain, and shortness of breath, which may prompt investigation with imaging. We present a case of giant left atrium (GLA) disguised as a massive pleural effusion.

CASE PRESENTATION

A 42-year-old female visitor from the West Indies with a medical history of RHD with mechanical mitral valve replacement 2 years prior, on warfarin, presented to the hospital with symptoms of fever, productive cough, shortness of breath, and pleuritic chest pain for 4 days. Physical examination revealed decreased breath sounds in the right lower lung field. Pertinent laboratory results included hemoglobin of 10.1 g/dL, digoxin level of 0.3 ng/mL, and subtherapeutic international normalized ratio of 1.2. Electrocardiography (Figure 1) showed atrial fibrillation with rapid ventricular response at 118 beats/min and right-axis deviation with poor R-wave progression around the precordial leads.

Chest radiography (Figure 2) suggested a large right-sided consolidation and effusion with lower left-sided consolidation.

The patient was admitted with the impression of community-acquired pneumonia and started on antibiotics. Transthoracic echocardiography was performed, and significant findings included massive dilatation of the left atrium and a bileaflet mechanical mitral valve prosthesis that appeared to be functioning normally (Figure 3A and B, Video 1).

Computed tomography of the chest (Figures 4 and 5) with contrast showed massive dilatation of the left atrium, which measured

14 × 20 × 13 cm (craniocaudal × transverse × anteroposterior dimension) and a thrombus measuring ≥6 cm.

Our patient was diagnosed with RHD when she was 22 years of age. She reported having normal cardiac angiographic findings before the surgery and a normal life after her mitral valve replacement, without any hospitalizations. Given a normally functioning mechanical mitral valve with a gradient of 2 mm Hg, and in the context of long-standing mitral valve disease, acute intervention was not indicated. She was started on metoprolol with continuation of digoxin and bridged with heparin until the international normalized ratio was therapeutic. She then returned to her country to continue the remainder of her treatment. It is unknown whether her thrombus ever resolved.

DISCUSSION

GLA is mainly associated with RHD and is defined as one in which the left atrium touches the right lateral side of the chest wall.¹ It is a rare condition, with a reported incidence of 0.3%.² Echocardiography provides the evidence for diagnosis with a left atrial anterior-posterior diameter of >8 cm and a left atrial volume index of >48 mL/m², which is considered severely abnormal. The American Society of Echocardiography states that a normal value is 16 to 34 mL/m².³ There have been multiple speculations about what causes the distortion of the left atrium. Although Hurst¹ attributed the dilatation of the left atrium to the rheumatic process causing pancarditis, pathologic studies have failed to reveal the Aschoff nodules (fibrinoid necrotic center found in the myocardium surrounding blood vessels and other regions of the body) in the atrial tissues; rather, these studies revealed fibrosis with chronic inflammatory findings.^{4,5} Although biopsy was not performed, we hypothesized that long-standing rheumatic mitral stenosis and atrial fibrillation contributed to increased volume and pressure load and led to left atrial enlargement. A literature review found that initial chest radiographic studies in this disease process are often thought to show a right-sided pleural effusion, as was thought to be the cause of our patient's symptoms. Further imaging with echocardiography and computed tomography of the chest can provide clarity for diagnosis.

CONCLUSION

RHD continues to be a common health problem in the developing world, causing morbidity and mortality among both children and adults. GLA should be kept in mind whenever a patient presents with a history of rheumatic mitral disease history and right lung opacification on chest radiography. The correct diagnosis of left atrial enlargement is at times not possible by routine chest radiography alone and may be misdiagnosed as a mass lesion or pleural or pericardial effusion.² RHD is uncommon in the United States but is reported to be the cause of 2% of cardiovascular deaths globally.⁶ We must be alert to the fact that many immigrants to the United States come from

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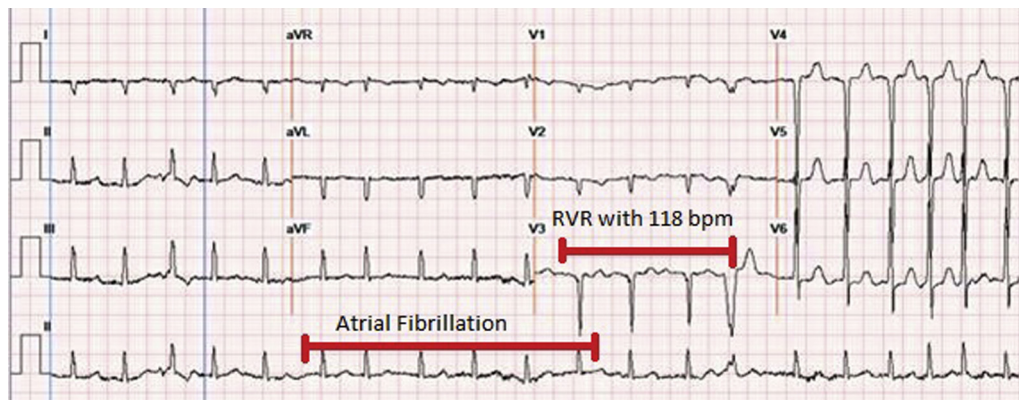


Figure 1 Admission electrocardiogram showing atrial fibrillation with rapid ventricular rhythm (RVR).

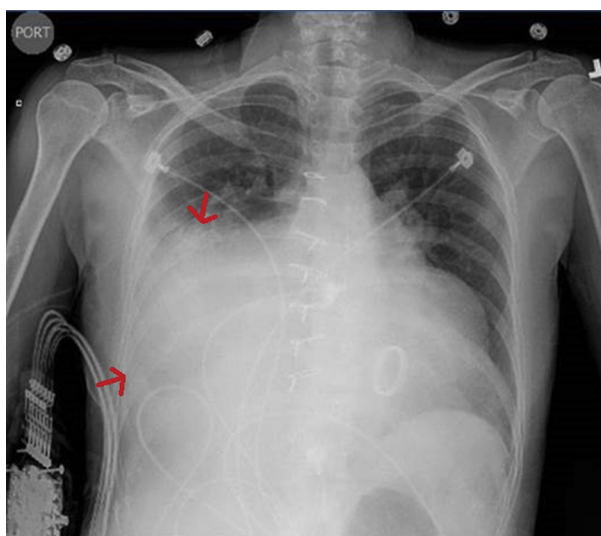


Figure 2 Chest radiograph reported as “There is a moderate size consolidation of the right mid lung to the right lower lobe with silhouetting the right cardiac border and right hemidiaphragm [red arrows]. This may be combination of pleural effusion and consolidation.”

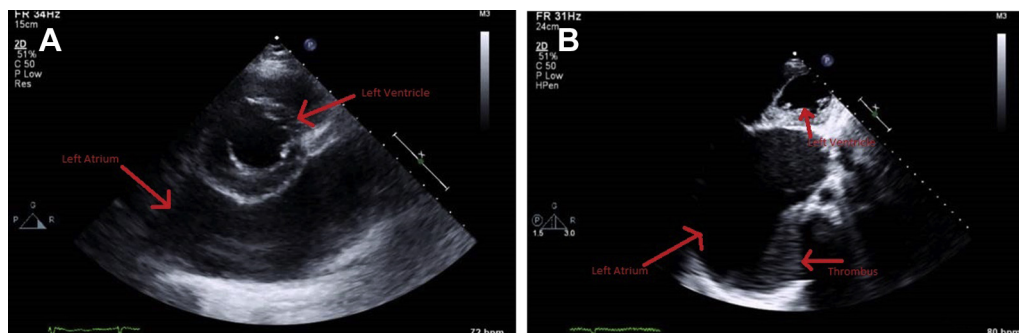


Figure 3 (A) Echocardiographic parasternal short-axis view of left atrium and left ventricle. **(B)** Echocardiographic apical four-chamber view of left atrium, left ventricle, and thrombus.

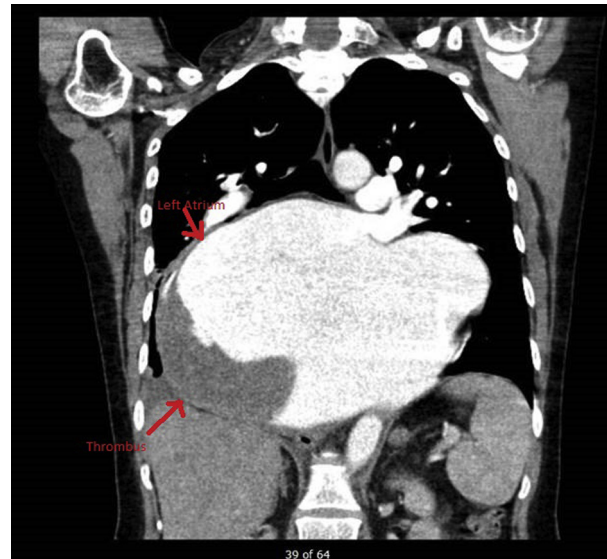


Figure 4 Computed tomography with contrast showing dilated left atrium with superimposed thrombus (coronal view).

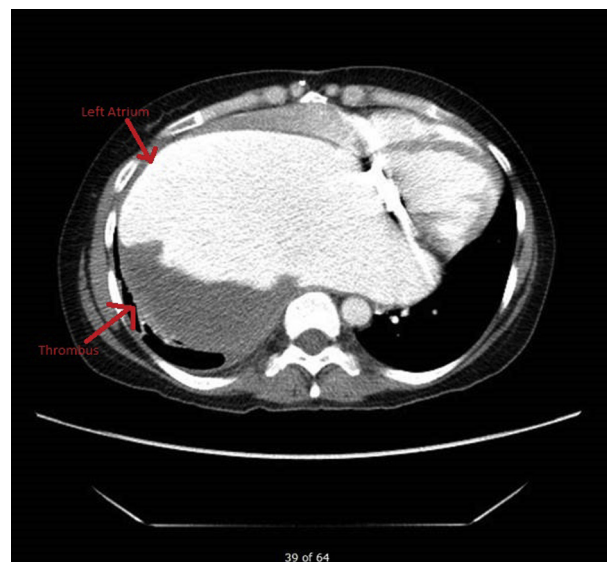


Figure 5 Computed tomography with contrast showing dilated left atrium with superimposed thrombus (axial view).

countries where rheumatic fever is still relatively common and may have pathologic findings that are rarely seen in developed countries today.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.case.2018.07.001>.

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