

## Mobile left atrial thrombus - ping ball: A case report

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## ABSTRACT

A 45-year-old female with a history of chronic rheumatic heart disease, chronic atrial fibrillation and a past mitral balloon valvotomy in 2002, arrived at the hospital with severe mitral stenosis. A large free-floating thrombus was discovered in her left atrium she was recommended to undergo immediate surgery. The surgery successfully improved her condition without any complications.

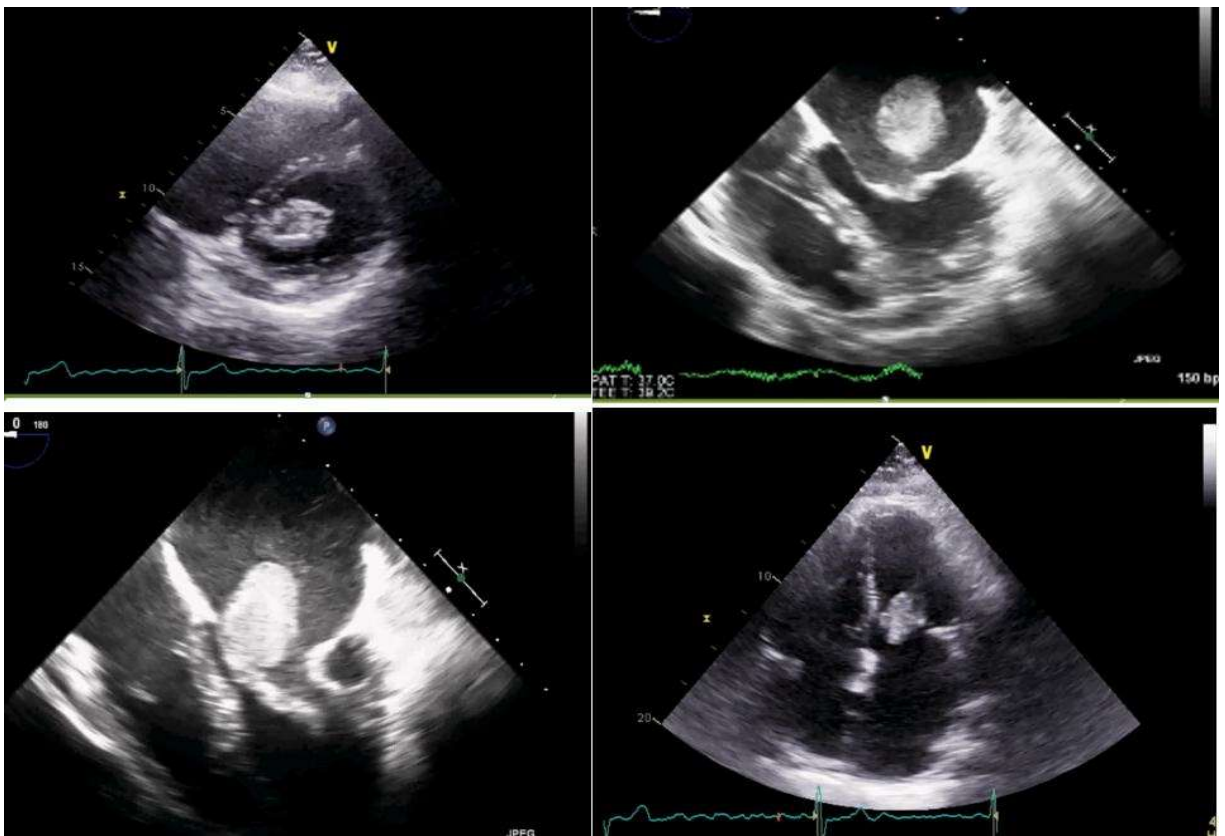
**Keywords:** Ball thrombus, Left atrial thrombus, Rheumatic heart disease, atrial fibrillation, Mitral stenosis.

## 1. INTRODUCTION

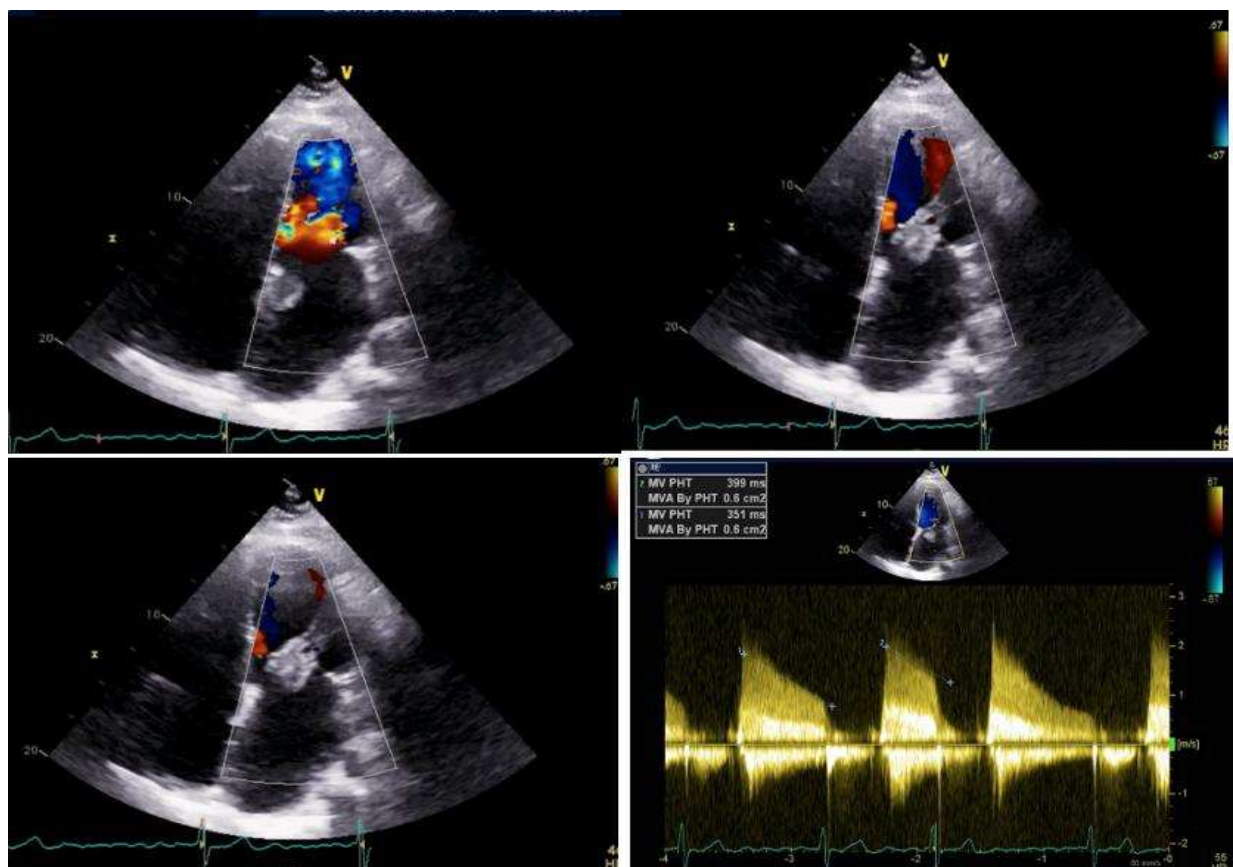
Despite a drop in frequency over the previous century, currently, the major cause of cardiovascular disease in developing countries is rheumatic heart disease (RHD). Furthermore, RHD accounts for around 15% of all diagnosed heart failure patients in endemic countries (Seckeler and Hoke, 2011). One study found that left atrial clots were present in a third of patients with severe rheumatic mitral stenosis and atrial fibrillation (Srimannarayana et al., 2003). The confusing part is in choosing the method of treatment as it depends on the presence of risk factors for left atrial appendage (LAA) thrombus after excluding other differential diagnoses like tumors, it must be investigated fully to minimize the risks of developing a poor prognosis.

## 2. CASE

The patient is a 45-year-old female who is a known case of chronic rheumatic heart disease and chronic atrial fibrillation, with symptoms of congestive heart failure and a history of previous mitral balloon valvotomy was done. A mechanical mitral valve replacement was done to the patient 14 years later. This time, she presented to us with severe mitral stenosis. The patient, a 45-year-old obese Saudi woman, was also found to have a large free-floating clot in her left atrium (Figure 1); an echocardiography revealed that she had severe mitral stenosis (Figure 2).

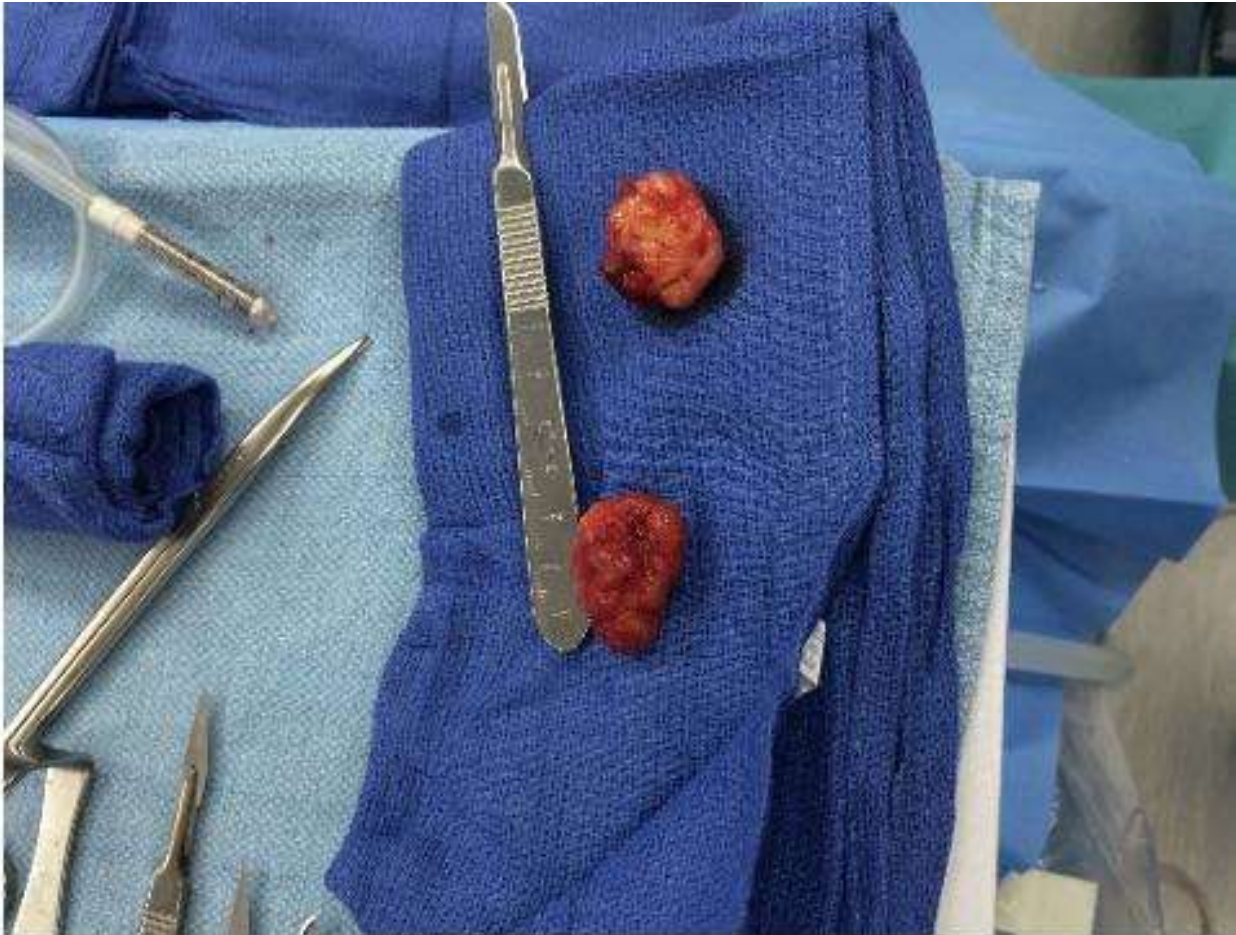


**Figure 1** Echocardiogram showed a mobile mass in the left atrium over the mitral valve at different stages of atrial contractions



**Figure 2** Echocardiogram with Doppler assessing the blood flow in the presence of the mass at the mitral valve

She was advised to have immediate surgery. A thrombectomy was performed, 2 clots were extracted a ball thrombus which was floating in the left atrium and the other attached to the LAA (Figure 3). The patient had a successful recovery following the surgery, was afebrile and was hemodynamically stable. The patient had no ongoing problems or worries. The last INR of the patient was 2.1; our target INR was between 2-3, so we provided the patient with an anticoagulation form so that she can make her INR check at the local hospital and the dose of warfarin to be readjusted accordingly.



**Figure 3** Post thrombectomy, the free-floating clot was removed around 2 cm in diameter, the other 2nd clot that was attached to the left atrial appendage was removed and thrombus formations were thoroughly cleaned from the left atrial wall

### 3. DISCUSSION

Left atrial thrombus is a rare but life-threatening condition that affects the heart (kasem, 2022). Introduced first by Wood, (1814) after an autopsy was done on a 15-year-old girl who had rheumatic mitral stenosis and syncope, he described the free-floating thrombus as a "ball thrombus". It goes under a list of differential diagnosis that may give the same clinical manifestation as arrhythmia mainly atrial fibrillation, syncope, palpitations and others that needs to be ruled out carefully, such as Myxoma, pseudocysts, bronchogenic cysts, hydatid cysts and cyst-like thrombi. Few cases reported worldwide about ball thrombus since 1814, were discovered with arrhythmia and found to be associated with rheumatic mitral stenosis.

The most common arrhythmia found in the reported cases is atrial fibrillation, but the incidence of the main etiology differs depending on the population involved in the reports (Wrisley et al., 1991). The LAA is a very common site of thrombus formation as it accounts for more than 90% of thrombi connected to non-rheumatic atrial fibrillation (Al-Saady et al., 1999). In addition to MRI or CT which can be done to rule out other differentials; the best method to identify a ball thrombus is echocardiography, particularly TEE, which provides sufficient details about the mass's features, morphologic shape and appearance, location of attachment, types of margins and presence or absence in the appendage (Wrisley et al., 1991; Abdulrahman).

As the presented case showed significant factors, known in this patient relatively may lead to the formation of the thrombus in chronic rheumatic heart disease. Few sources reported similar cases to our case worldwide either with or without mitral stenosis. Confusing part in the treatment when there are no risk factors for LAA thrombus and here the differential diagnosis must include



the tumor and should be investigated fully as most of the cases end with poorer prognoses. The role of anticoagulants to treat this condition varies in the reported cases as some of the patients did not respond probably to it, but the definite treatment of left atrial thrombus is emergent surgery that showed an absolute decrease in the complications that may occur with the thrombus starting from embolism until sudden cardiac death (Wrisley et al., 1991).

Management of mitral stenosis (MS) with atrial fibrillation in patients developing LAA thrombosis is quite difficult. The risk of thrombosis is high. Although not mentioned in the guidelines clearly about LA thrombus in RHD, the surgical approach is safer if there was severe MS. Moderate MS and LAA thrombus is again difficult to manage. Although medical therapy is more suitable in moderate cases and a high INR is always considered for the choice of prosthesis type.

#### 4. CONCLUSION

Our patient presented with severe mitral stenosis, she is a known case of chronic rheumatic heart disease and atrial fibrillation and was found to have a large LAA mobile thrombus and an emergent mechanical mitral valve replacement surgery was done. Postoperative the patient did very well and she was asymptomatic in the follow-up, but strict anticoagulation was provided as a higher INR target was sought.

#### Contributions

Dr Mohammed Alshammri: Supervised the pre-and post-operative management of the patient and was involved in manuscript writing.

Manal Alkhonezan: Manuscript writing and editing.

Shahad Alkhonezan: Manuscript writing and editing.

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#### Informed Consent

Informed Consent was obtained from the patient.

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#### Conflict of interest

The authors declare that there is no conflict of interests.

#### Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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