Ball Valve Thrombus in LA with Peripheral Embolisation - Not an Uncommon Complication

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Abstract

We report here a case of large freely mobile left atrial ball thrombus in a middle aged female patient having past history of PTMC (percutaneous trans mitral commissurotomy) few years ago for Rheumatic mitral stenosis with Atrial fibrillation (AF) diagnosed by TTE. She also underwent PTA (percutaneous trans luminal angioplasty) for Right superficial femoral artery one year ago for its thrombotic occlusion.

She again presented with symptoms and signs of thromboembolism in the Right upper limb with complaints of pain at right shoulder and forearm gradually increasing in severity since 2 days. At presentation the patient was under anticoagulated.

So, she was planned for emergency Right upper limb thrombus extraction followed by Mitral valve replacement with clot removal with Radiofrequency ablation of LA for AF.

Keywords: Percutaneous Transluminal Mitral Commissurotomy (PTMC); Transthoracic Echocardiography (TTE); Rheumatic Mitral Stenosis; Percutaneous Transluminal Angioplasty (PTA); Radiofrequency Ablation; Atrial Fibrillation (AF); LA (Left Atrium)

Introduction

The incidence and prevalence of Rheumatic heart disease has decreased worldwide but it is still prevalent in the developing countries. Thrombus formation and embolization is common in patients with severe mitral stenosis with atrial fibrillation with dilated LA. Systemic embolization may be first clinical manifestation of mitral stenosis.

Almost spherical, freely mobile floating thrombus in LA is not common, such clot usually name as “ball thrombus”.

Clinically ball valve thrombosis can produce symptoms of heart failure, peripheral embolism, embolic stroke or sudden death.

Ball thrombus can endanger the life, if not treated promptly and timely.

**Case Report**

A 46-year-old female patient with past history of PTMC 16 years back in known case of Rheumatic mitral stenosis with Atrial fibrillation. She underwent PTA to right SFA last year for thrombotic occlusion.

She presented to us with acute pain at right shoulder and forearm gradually increasing in severity over 2 days. There was no history of stroke or TIA or CCF.

On examination there was a mid-diastolic murmur at the apex with irregular heart rate 65 - 75 per min, BP 125/70 mmHg, and SPO$_2$ 100% on room air.

Right hand was pale, cold and painful on movement and bluish discoloration of finger tips was noted (Figure 1) there was no radial and brachial pulse in right upper limb. ECG revealed AF with controlled VR. On TEE (Figure 2) a large floating rounded mass in LA (3.1*2.0 cm) which was freely moving and bouncing back after striking to the mitral valve leaflets like ball in pin ball machine with severe rheumatic mitral stenosis - MVA (0.9 cm$^2$) with mild AS and AR.

![Figure 1](image1.jpg)

**Figure 1:** 1a. Before Embolectomy. 1b. After embolectomy.

CT angiography (Figure 3) revealed occlusion of 2nd part of axillary artery.

Patient was planned for staged surgical procedure. Right axillary artery embolectomy was done on emergency basis at the same time because of worsening of ischemic signs and symptoms (Figure 1).

Next day early morning mitral valve surgery was planned. Patient was induced with keeping in mind the possibility of total circulatory obstruction due to acute left atrial outflow tract obstruction required variable position of patient and emergency femora-femoral cardiopulmonary bypass [1].

The induction of anaesthesia was smooth and uneventful.

Peri operative TEE was done (Figure 2) to confirm the findings as a routine protocol. Mitral valve replaced with mechanical valve and removal of large spherical pink coloured mass with smooth surface without any attachment to any of the walls was done (Figure 4 and 5).

LAA was closed and radiofrequency ablation was done for AF.

Patient was weaned off bypass uneventfully and extubated same day and shifted to ward.

**Discussion**

The predisposing factor for LA thrombus in Rheumatic Heart Disease is usually Atrial fibrillation and a dilated LA. It is seen in 17% of Patients with severe mitral stenosis, and the risk is doubled in patients with Atrial fibrillation.

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In the current patient the clinical setting of mitral stenosis with AF and enlarged LA favours the diagnosis of thrombus. LA myxoma can simulate a thrombus but features consistent with myxoma like fever and raised ESR were absent. Anticoagulation and echocardiography follow up also helped us to differentiate between myxoma and thrombus. TEE is the extensive diagnostic tool to investigate a suspected intra cardiac mass involving the LA and the histopathological examination is the gold standard for diagnosis of myxoma.

Free ball valve thrombus is diagnosed is based on two criteria:

1. The thrombus must be larger than valve orifice.
2. It must have no sign of attachment to the atrial wall [2].

Stroke or transient embolism may occur during thrombus formation.

Nearly 20% of patient used to die at some time during the course of the disease prior to surgical treatment of mitral stenosis and 10 - 15% of them from its complication [3]. 80% of patients with mitral stenosis in whom systemic embolism develops are in AF [4] and this risk of recurrent events exceeds 10% per year [5]. Goswami, et al. described atrial fibrillation as an independent risk factor for thrombus formation [6]. Systemic embolization may be the first clinical manifestation of mitral stenosis.

A ball valve thrombus with no firm attachment to atrial wall can act as a source of emboli, and the patient presented in this report has already undergone PTA for right SFA one year ago. She was already on anticoagulation therapy but on presentation she had inadequate anticoagulation and was not on regular follow up with echocardiography after PTMC and presented with embolic occlusion of Right axillary artery and the echocardiography revealed freely mobile thrombus in LA.

Management of such patients involves urgent surgical removal of the thrombus with correction of the underlying cause and results in long term survival of more than 90% [7]. Such large thrombus with organized fibrin layer on the surface is unlikely to dissolve with Anticoagulation and thrombolytic therapy, that only helps in the prevention of its further progression [8].

Free floating ball thrombus is a dramatic and rare finding on echo in mitral valve disease and may even be seen after valve replacement which requires adequate anticoagulation [9,10].

**Conclusion**

Patients with Rheumatic mitral stenosis having AF with large LA size are more prone to develop LA clots. They often present with TIA, stroke or peripheral embolism.

It is very important to do regular follow up echocardiography and maintain adequate anticoagulation.

Management includes urgent surgical removal of thrombus with underlying valvular correction and lifetime adequate anticoagulation even after mitral valve replacement.

**Bibliography**

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