

## Fire Ball in the Heart-Floating Ball Thrombus in Left Atrium

Hemant Chaturvedi\*

Non Invasive Cardiology, eternal Heart Care Research Institute, Jaipur, Rajasthan, India

\***Corresponding Author:** Hemant Chaturvedi, Consultant & Coordinator, Non Invasive Cardiology, eternal Heart Care Research Institute, Jaipur, Rajasthan, India.

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### Abstract

We present here a very uncommon case of a large freely mobile left atrial ball thrombus due to severe mitral valve stenosis diagnosed by incidental echocardiography, in a patient with neurological cerebellar sign and symptoms. The patient's symptom was unable to stand and balance while walking. She had atrial fibrillation with no syncope. She was planned for cardiac surgery including thrombus removal with Mitral valve replacement and hence given anticoagulant therapy prior to surgery which resulted in large intracerebral bleed and death.

**Keywords:** Floating Ball Thrombus; Left Atrium; stenosis; echocardiography; atrial fibrillation; Mitral valve; anticoagulant therapy

### Introduction

Patients with severe mitral Stenosis of rheumatic etiology, almost spherical freely mobile floating thrombus in left atrium is not common, mostly seen such a clot is usually named as "ball thrombus". This is a very rare complication of mitral Stenosis. Ball thrombus has a great risk to endanger the life if not treated properly and timely [1]. We report of such unusual complication in a woman presented with neurological symptoms with incidental finding of mitral Stenosis due to rheumatic heart disease.

### Case Report

We presented a case of 42 years old lady presented in emergency room with complaints of having vertigo, recurrent vomiting, not able to maintain her balance for last 3-4 days. She is non diabetic, normotensive with no history of significant chronic illness. On examination she was conscious but drowsy, disoriented, had facial puffiness, not able to stand and walk properly. She had irregularly irregular pulse (Atrial fibrillation) ~ 118 /min with BP 108/72 mmHg. She was afebrile, maintaining oxygen saturation 96% on room air. Power of left upper limb was 3/5. ECG suggestive of atrial fibrillation with fast ventricular rate (image -1). Neurological examination showed cerebellar signs positive. MRI (Magnetic resonance image) brain suggestive of multiple cortical/ subcortical both cerebellar hemisphere, cerebellar vermis, right medial temporal, right parieto-occipital and left hippocampal regions acute infarcts (image -2). Finally called up for Echocardiography assessment in view atrial fibrillation. Echocardiography clearly states the diagnosis RHD (Rheumatic Heart disease); Severe Mitral Stenosis (Mitral Valve Area 0.9 sq cm), thickened sub-valvular apparatus, Mild MR, Moderate eccentric TR, Severe PAH; Normal Biventricular size & systolic function, dilated left atrium with SEC (spontaneous echo contrast) grade III in left atrium & left atrial appendage. Large freely floating mobile round echogenic mass (43 X 36 mm) with well defined smooth borders, rolling across the left atrium; suggestive of ball like thrombus in left atrium which is high risk for embolisation. (*FIRE BALL*) (image -3) X ray suggested cardiomegaly. Cardiothoracic surgery department planned for surgical removal of thrombus along with mitral valve replacement (with high risk consent). She was admitted and managed with anticoagulants heparin preoperatively. On the 3rd day of hospital stay, the patient suddenly went into deep coma, convulsion with decorticate posturing. CT scan revealed massive hemorrhage in bilateral cerebellum with ventricular extension. The patient died on 5<sup>th</sup> day of hospitalization.

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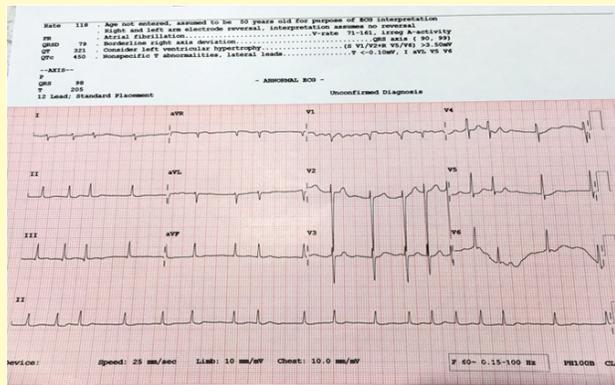


Figure 1: ECG showing atrial fibrillation with fast ventricular rate.

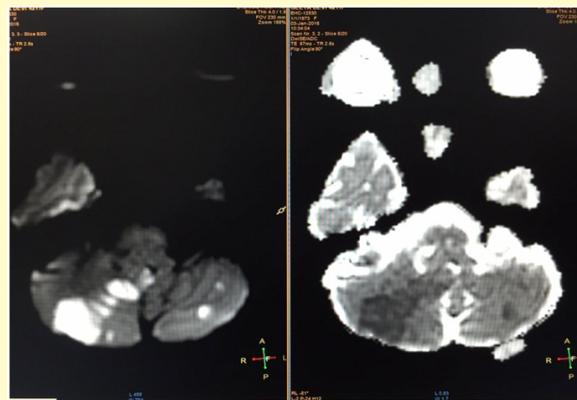


Figure 2: MRI brain showing Acute infarcts in cerebellar hemispheres.

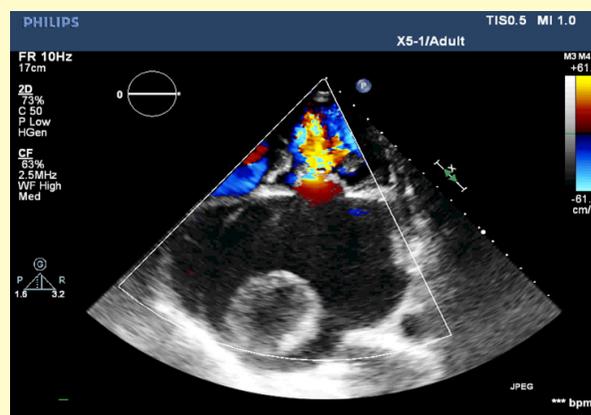


Figure 3: Fire ball in the Heart; Large freely mobile round ball thrombus in dilated LA with severe MS

## Discussion

Left-atrial thrombus is an uncommon complication of mitral valve disease [1]. Ball thrombus arises on interatrial septum as mural thrombus. Thrombus slowly enlarges to become a projecting mass and connected via a pedicle from atrial wall. Due to fibrin and platelet deposition; as the bulbous end of thrombus enlarges, the pedicle thins out and lengthens, then eventually separates from the main ball thrombus. Thrombus freely spins in dilated left atrium and takes characteristic smooth polished appearance. Free ball valve thrombus diagnosis is based on two criteria: the thrombus size must be larger than the valve orifice, and it must have no signs of attachment to the atrial wall [2]. Stroke or Transient embolism may occur during thrombus formation [5].

Nearly 20% of patients used to die at some time during the course of the disease prior to use of surgical treatment of mitral stenosis and about 10-15 % of them died from its complications [3]. Approximately one-fourth of all mortalities in patient with mitral valve disease were due to thromboembolism before the era of anticoagulant therapy and surgical treatment, [4]. Embolisation correlates inversely with cardiac output and directly with patient's age and size of left atrium; 80% of patients with mitral Stenosis in whom systemic emboli develop are in atrial fibrillation [7] and this risk of recurrent events exceeds 10% per year [10]. The possibility of transient atrial fibrillation and underlying infective endocarditis should be considered, if embolisation occurs in patients with sinus rhythm [9]. Clinically ball valve thrombus can produce symptoms of heart failure, peripheral embolism or embolic stroke or sudden death [8]. Large Pedunculated ball valve thrombus rarely cause abrupt left atrial outflow tract obstruction in variable body position which may cause syncope or sudden death and requiring emergency surgical intervention[5]. The clinical setting of mitral stenosis and LA enlargement with atrial fibrillation, favors the diagnosis of thrombus but LA myxoma may also simulate a thrombus. In a clinical setting that favors thrombus, anticoagulation and echocardiographic follow-up can help to differentiate between a myxoma and thrombus. Free-floating ball thrombus is a dramatic and rare picture finding on echocardiography in mitral valve disease patients and may even seen after valve replacement which require adequate anticoagulation [11,6].

Here, the most unfortunate event was that the patient remained alive for many days before hospital admission but died soon after institution of anticoagulant therapy.

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