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Case Report

Free-Floating Left Atrial Ball-Valve Thrombus in Severe Rheumatic Mitral Stenosis Presenting with Acute Ischemic Stroke

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Abstract

Left atrial ball thrombus is an uncommon but potentially catastrophic complication of rheumatic mitral stenosis, particularly in patients with atrial fibrillation and dilated left atrium. Unlike mural thrombi, a free-floating spherical thrombus poses dual risks of systemic embolization and intermittent obstruction of the mitral valve orifice, which may lead to sudden death. We report the case of a 70-year-old woman with severe calcific rheumatic mitral stenosis who presented with acute left-sided hemiparesis secondary to ischemic stroke and was found to have a large freely mobile left atrial ball thrombus on transthoracic echocardiography. The case emphasizes the importance of early echocardiographic diagnosis and individualized management strategies.

Introduction

Thrombus formation in the left atrium is a well-recognized complication of rheumatic mitral stenosis, particularly in the presence of atrial fibrillation, enlarged left atrium, and reduced left ventricular function. Most left atrial thrombi are attached to the atrial wall or left atrial appendage; however, a rare variant exists in the form of a free-floating spherical thrombus, commonly referred to as a "ball-valve thrombus." This entity is clinically significant because of its unpredictable mobility and potential to obstruct the mitral valve intermittently, leading to syncope, acute pulmonary edema, or sudden cardiac death.

The pathogenesis of a spherical thrombus is thought to involve detachment of an initial mural thrombus from the left atrial appendage, followed by repetitive collisions with the atrial wall and mitral valve apparatus. Continuous rotational forces within the dilated atrial cavity contribute to its smooth, rounded morphology. Clinically, these thrombi are associated with high embolic risk, particularly to the cerebral circulation, resulting in ischemic stroke, as seen in this case.

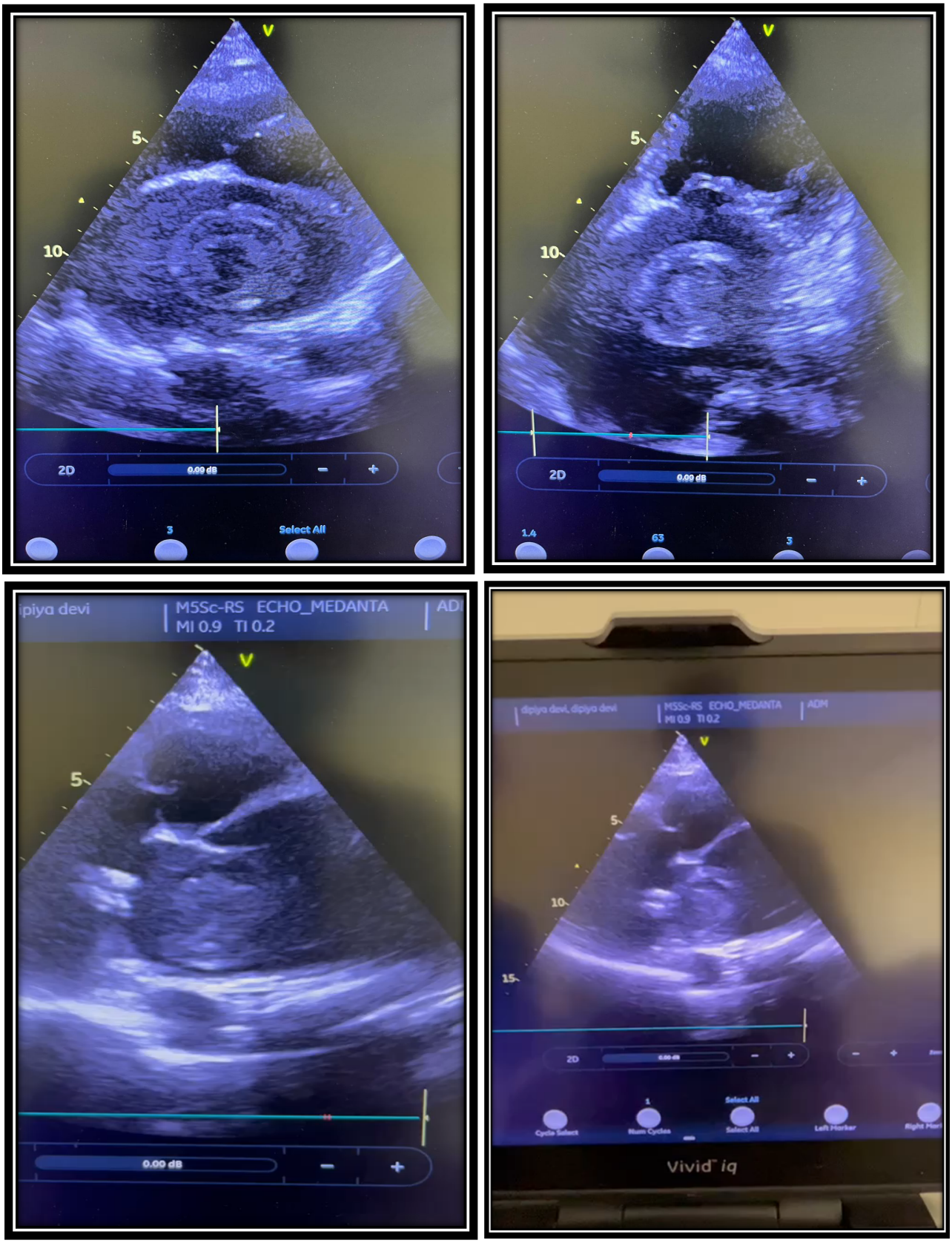
Case Presentation

A 70-year-old woman was brought to the emergency department with sudden onset weakness of the left half of her body. She had no significant prior medical history and was not on regular medications. On examination, her pulse rate was 80 beats per minute, blood pressure was 110/95 mmHg, oxygen saturation was 99% on room air, respiratory rate was 28 breaths per minute, and temperature was normal. Neurological assessment suggested an acute cerebrovascular event.

Non-contrast CT and MRI of the brain revealed an acute to subacute ischemic infarct with chronic small vessel ischemic changes. Electrocardiography demonstrated atrial fibrillation. Transthoracic echocardiography showed severe calcific rheumatic mitral stenosis with mild mitral regurgitation, mild to moderate aortic regurgitation, and a left ventricular ejection fraction of 40–45%. The left atrium was markedly dilated, with mild tricuspid regurgitation and mild pulmonary arterial hypertension. Most notably, a large, echogenic, freely mobile, spherical structure was visualized bouncing within the left atrium, consistent with a left atrial ball-valve thrombus.

Management

The patient was admitted to the intensive care unit and managed conservatively with intravenous heparin, antiplatelet therapy, and statins. She also received intravenous mannitol to reduce cerebral edema, broad-spectrum antibiotics, and physiotherapy for neurological rehabilitation. Surgical thrombectomy was considered but deferred due to her clinical stability and perceived surgical risk.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Discussion

This case illustrates the classical features of a left atrial ball-valve thrombus in the setting of rheumatic mitral stenosis and atrial fibrillation. The spherical shape and smooth surface of the thrombus suggest remodeling due to continuous movement within the atrial cavity. The dilated left atrium and atrial fibrillation likely contributed to stasis and thrombus formation.

The major clinical risks associated with this condition include cerebral embolization, which occurred in this patient, as well as myocardial infarction, peripheral arterial embolism, and sudden death from acute mitral valve obstruction. While surgical removal remains the definitive treatment in many cases, anticoagulation alone may be considered in selected patients with small, stable thrombi and high surgical risk. However, the unpredictable nature of ball thrombi makes conservative management controversial.

Conclusion

Free-floating left atrial ball thrombus is a rare but life-threatening complication of rheumatic mitral stenosis. Prompt echocardiographic diagnosis is crucial, as early detection may prevent fatal outcomes. Although surgery is often recommended, individualized decision-making based on hemodynamic status, embolic risk, and comorbidities remains essential.

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