

VALVULAR HEART DISEASE

THE FOUR CORNERS: CLINICAL VIGNETTE CORNER

Large Right Atrial Thrombus Alongside Left Atrial Thrombus in a Rheumatic Severe Mitral Stenosis Patient



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ABSTRACT

We present finding of right atrial thrombus concomitant with recurrent left atrial thrombus in a patient diagnosed with rheumatic severe mitral stenosis. Its significance lies in the potential complications associated with right atrial thrombus, including spontaneous or iatrogenic pulmonary embolism or paradoxical systemic embolization, underscoring the importance of thorough imaging. (JACC Case Rep. 2024;29:102623) © 2024 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 45-year-old female, previously diagnosed with severe rheumatic mitral stenosis (MS), presented with worsening exertional dyspnea and palpitations. On examination, her blood pressure measured 96/67 mm Hg, and her pulse rate was 85 beats/min. Physical examination revealed a loud first heart sound, an audible opening snap, and a diastolic rumbling murmur upon auscultation. The patient was found to be in normal sinus rhythm.

Laboratory findings indicated a hemoglobin level of 11.7 g/dL, a white blood cell count of $8.6 \times 10^3/\mu\text{L}$, a platelet count of $166 \times 10^3/\mu\text{L}$, and a creatinine level of 0.63 mg/dL.

LEARNING OBJECTIVES

- To recognize the significance of thorough imaging for RA and RA appendage thrombus in patients with rheumatic severe MS.
- To implement appropriate management strategies for patients with biatrial thrombi with rheumatic severe MS.

Transthoracic echocardiography revealed normal biventricular function, thickened leaflets of the mitral valve with a domed anterior mitral leaflet and fixed posterior mitral leaflet, resulting in restricted opening at the tips and indicative of rheumatic severe MS with trivial mitral regurgitation. The mitral valve area (MVA) measured 0.8 cm^2 , with a peak pressure gradient of 33 mm Hg and a mean pressure gradient of 23 mm Hg at a heart rate of 88 beats/min. Additionally, a Wilkins score of 8 of 16 was noted. The aortic valve appeared tricommisural with mildly thickened cusps and normal mobility. Mild tricuspid regurgitation and mild pulmonary hypertension were observed, with pulmonary artery systolic pressures measuring 45 mm Hg.

Transesophageal echocardiography (TEE), performed to assess the suitability of percutaneous mitral balloon valvuloplasty in rheumatic severe MS (Video 1), revealed a MVA of 0.8 cm^2 , a peak pressure gradient of 20 mm Hg, and a mean pressure gradient of 12 mm Hg at a heart rate of 72 beats/min, along with a Wilkins score of 7 of 16. Notably, TEE identified a

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

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**ABBREVIATIONS
AND ACRONYMS**

LA = left atrium/atrial
MS = mitral stenosis
MVA = mitral valve area
RA = right atrium/atrial
TEE = transesophageal echocardiography

1.5 × 1.5 cm thrombus in RA (Figure 1, Videos 2 and 3) and a 2.4 × 1.8 cm thrombus in the LA (Figure 1, Videos 4 and 5).

Previous TEEs conducted 2 years, 1 year, and 6 months ago for pre-percutaneous mitral balloon valvuloplasty evaluation of rheumatic severe MS, at 3 separate facilities, had revealed the presence of left atrial (LA) thrombus only, with no mention of right atrial (RA) thrombus.

The patient's medical regimen included oral medications such as bisoprolol 5 mg, furosemide 40 mg, and warfarin 5 mg daily. Her international normalized ratio was within the therapeutic range 59% of the time. Additionally, she received a monthly intramuscular injection of benzyl penicillin totaling 1.2 million units.

Due to recurrent LA thrombus accompanied by RA thrombus, surgical intervention was planned, which includes mitral valve replacement and the removal of both LA and RA thrombi.

The presence of RA thrombus in rheumatic severe MS is rare, underscoring the importance of thorough

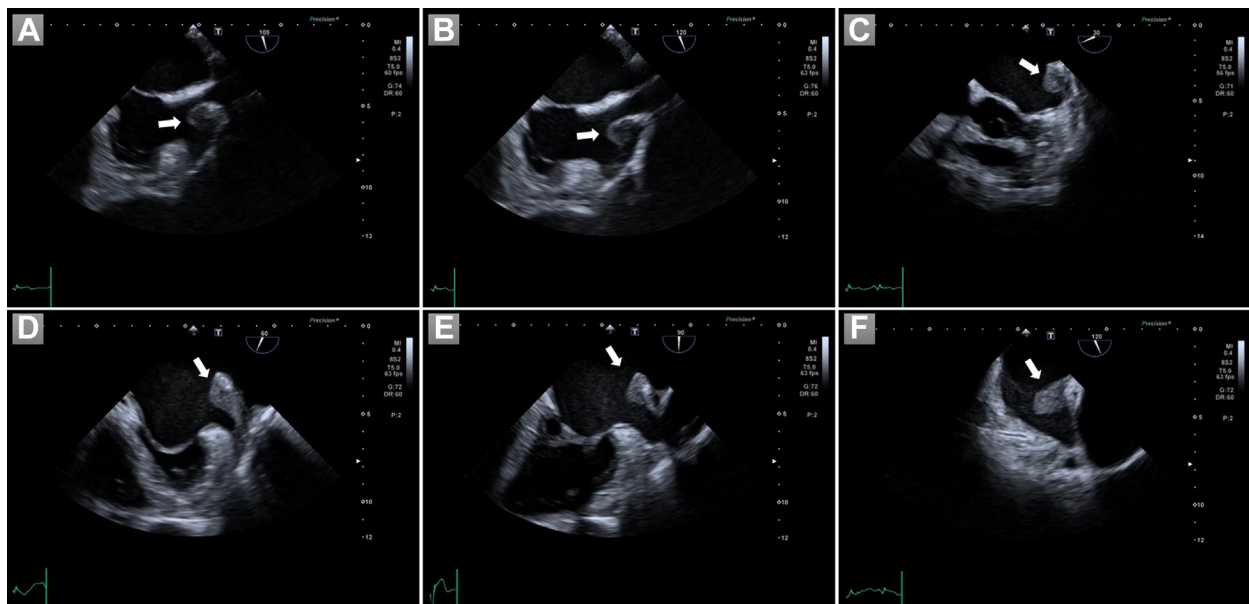
imaging. Factors contributing to LA thrombus formation in patients with MS and normal sinus rhythm include larger LA size, a history of paroxysmal atrial fibrillation, smaller MVA, advancing age, and increased severity of stenosis.¹ RA thrombus formation is less frequent and may result from factors such as central venous catheters, intracardiac devices, or systemic embolization.

Complications associated with LA thrombi include systemic embolization leading to stroke or peripheral arterial thromboembolism.² RA thrombi can precipitate pulmonary embolism or paradoxical systemic embolism.³

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FIGURE 1 Transesophageal Echocardiography

Transesophageal echocardiography images illustrating the presence of thrombus in the RA appendage at 105° (A) and 120° (B), and the presence of thrombus in the LA appendage at 30° (C), 60° (D), 90° (E), and 120° (F) at midesophageal level. LA = left atrial; RA = right atrial.


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thrombus, transesophageal echocardiography

 **APPENDIX** For supplemental videos, please see the online version of this paper.

KEY WORDS comprehensive imaging assessment, left atrial thrombus, mitral stenosis, rheumatic heart disease, right atrial