

## THE CLINICAL PICTURE

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# The Clinical Picture

## Multiple intracardiac thrombi

A 60-YEAR-OLD WOMAN presented with sudden swelling and pain in her right arm. She reported progressive lower-extremity edema and abdominal girth over the past month, associated with shortness of breath and orthopnea. She had a remote history of two spontaneous abortions.

Duplex ultrasonography revealed massive venous thrombosis extending from the antecubital fossa to the right atrium. Transthoracic echocardiography revealed severe left ventricular (LV) dysfunction and multiple echo-dense masses in the LV apex, the right ventricle, and the left atrium, as well as at the base of the tricuspid valve (FIGURE 1). There was no evidence of a structural heart defect, eg, patent foramen ovale, atrial septal defect, or ventricular septal defect. Cardiovascular magnetic resonance imaging (MRI) confirmed the densities as thrombi (FIGURE 2). Her ejection fraction was 35%.

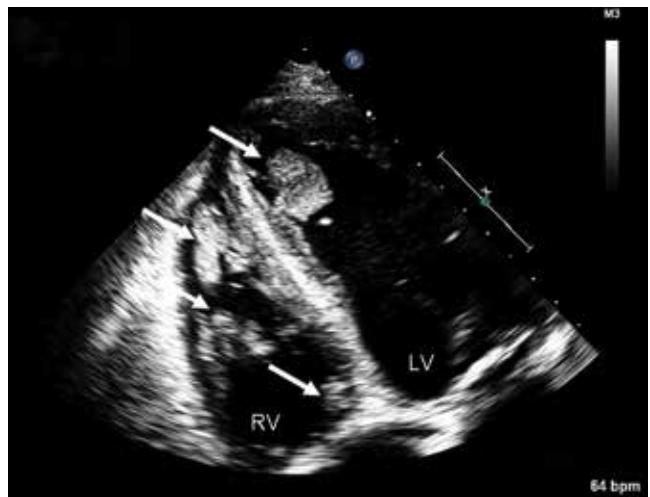
Blood testing on admission showed a prolonged partial thromboplastin time of 55.0 sec (reference range 22.7–35.6) and a prothrombin time of 13.4 sec (reference range 11.3–14.5). Tissue thromboplastin inhibition at a dilution of 1:50 was elevated at 1.5 sec (reference range 0.7–1.3), as was the tissue thromboplastin inhibition at a dilution of 1:500—ie, 1.6 sec (0.7–1.3). Dilute Russell viper venom testing and anticardiolipin antibody immunoglobulin G and M testing were negative. The lupus antiphospholipid antibody test and the hexagonal lipid neutralization test were positive.

The patient's clinical presentation of extensive unprovoked venous thrombosis and her laboratory profile together suggested the antiphospholipid antibody syndrome.

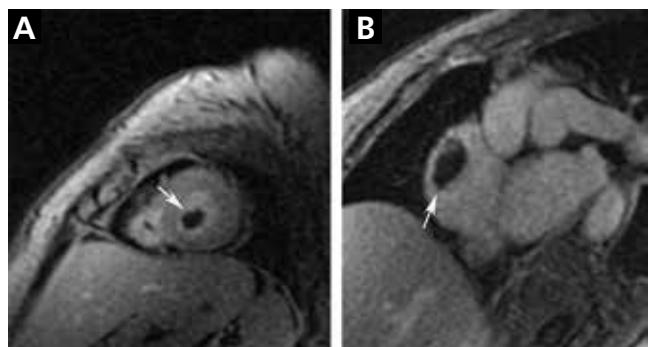
### ■ SURGICAL TREATMENT NOT AN OPTION

Given her extensive clot burden, surgical thrombectomy was not an option. Instead, warfarin therapy was started and resulted in a progressive

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**FIGURE 1.** During the initial evaluation, echocardiography (apical four-chamber view) showed right ventricular and left ventricular thrombi (arrows).



**FIGURE 2.** Cardiovascular magnetic resonance imaging with contrast enhancement confirmed the presence of thrombi in the right and left ventricles (A) and in the right atrium (B) (arrows).

diminution of the thrombi. At 4-month follow-up, the thrombi had nearly resolved (FIGURE 3), and her LV ejection fraction had increased to 45% to 50%. Eighteen months later, she was diagnosed with



**FIGURE 3.** After 4 months of oral anticoagulation therapy, echocardiography (apical four-chamber view) showed near-resolution of the thrombi.

cholangiocarcinoma. In retrospect, we believe the cancer predisposed the patient to the hypercoagulable state and, subsequently, to thrombosis.

**■ DIAGNOSING AND TREATING LEFT VENTRICULAR THROMBOSIS**

Ventricular thrombosis is a serious problem, most commonly associated with extensive myocardial infarction. It is a relatively common complication of myocardial infarction and of ischemic and nonischemic cardiomyopathies.<sup>1</sup> In this population, the incidence of LV thrombosis is reported to be in the range of 10% to 25%, and it increases with increasing LV end-diastolic diameter, lower ejection fraction, and anterior-wall-motion akinesia, and with the presence of apical aneurysms.<sup>2</sup> It is an important cause of morbidity and death, whether the thrombus is sessile or mobile.

**Cardiovascular MRI is emerging as the new gold standard test for detecting ventricular thrombosis**

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**How diagnostic imaging tests compare**

The diagnosis of LV thrombosis requires a certain level of suspicion and has traditionally relied on echocardiography. However, several studies have raised doubt about the sensitivity of echocardiography for the detection of left or right ventricular thrombi.<sup>3</sup> In a 2006 report, the sensitivity of transthoracic echocardiography in detecting LV thrombi was 23% and the sensitivity of transesophageal echocardiography was 40%.<sup>4</sup> In contrast, delayed-enhancement cardiovascular MRI had a sensitivity near 90%. Similarly, in another study,<sup>5</sup> contrast-enhanced echocardiography had a low but higher sensitivity of nearly 60%.<sup>5</sup> Therefore, cardiovascular MRI is emerging as the new gold standard test for the detection of this important complication of ventricular dysfunction and myocardial infarction.

**Treatment and screening**

The optimal management of intraventricular thrombi is poorly defined. It has been suggested from case series that large, mobile, or protruding LV thrombi have more potential for embolization and, therefore, that patients with these findings may benefit from surgical thrombectomy.<sup>6</sup> Oral anticoagulation has been reported to dissolve intraventricular thrombi, with success rates from 13% to 59%.<sup>7</sup> A prospective study of enoxaparin in 26 patients with LV thrombi reported resolution rates close to 73% at 3-week follow-up.<sup>8</sup>

There are no guidelines at present on which to base recommendations for screening patients for intracavitary thrombi or for starting empiric anticoagulation in those at risk. ■

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