Case Report

Venous Thromboembolic Disease Presenting as Inferior Vena Cava Thrombus Extending into the Right Atrium

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ABSTRACT

With increasing use of echocardiography, especially transesophageal echocardiography, the diagnosis of intracardiac masses has surged. Masses that are most commonly seen in the atrial chambers include thrombi due to atrial fibrillation, cardiac myxomas often located in the atria, and valvular vegetations of infective endocarditis. In this report we present a case of a patient who developed thrombus in the inferior vena cava that extended up to the right atrium and presented as an apparent intracardiac mass. This mass embolized to the right pulmonary artery shortly after diagnosis resulting in pulmonary embolism, which the patient fortunately survived.

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CASE REPORT

This case report had institutional review board approval. A 73-year-old male with an unremarkable past history was admitted with left lower leg pain. Areas of bilateral cellulitis with ulceration, necrosis and maggots were noted. His electrocardiogram demonstrated supraventricular tachycardia. The patient denied any history of shortness of breath or chest pain. He was empirically started on Unasyn for his cellulitis, and wound debridement was performed. He was admitted and treated for the supraventricular tachycardia with intravenous Cardizem. Myocardial infarction was ruled out.

The following day, a two-dimensional echocardiogram was performed which demonstrated severe systolic dysfunction with an ejection fraction of 15% to 20%. The right-sided chambers showed a large loculated mass in the right atrium, which was protruding through the tricuspid valve in diastole. Grade III diastolic dysfunction was also noted by Doppler echocardiography on the study.

Multiple mobile masses attached to each other by strands were seen in the right atrium on transesophageal echocardiography (figure 1). No definite attachment to the right atrial wall could be demonstrated. The mass also appeared to prolapse into the right ventricle through the tricuspid valve in diastole.

In light of atrial flutter and the suspicion of right atrial thrombus the patient was started on anticoagulation with Lovenox. The differential diagnosis included a primary cardiac tumor (e.g., a myxoma), secondary malignancy with clot extending into the right atrium, and endocarditis lesions. The day after admission the patient was found unconscious and pulseless, while the electrocardiogram demonstrated wide complex tachycardia. He was successfully resuscitated and subsequently taken to the cardiac catheterization laboratory to rule out any coronary stenoses and to evaluate for the possibility of a mass obstructing the tricuspid valve, which would require immediate surgery. There was 60% stenosis in the left anterior descending artery and 50% stenosis in the left circumflex artery. No evidence of valvular obstruction was seen. However, a mass or thrombus was seen in the inferior vena cava extending up into the right atrium.

At this time the patient was clinically stable without any evidence of significant hypoxemia on the arterial blood gases. The right atrial mass was felt to originate from the inferior vena caval system and not a primary cardiac mass. Computed tomography scans of the chest and abdomen were carried out to rule out any primary intrathoracic and intraabdominal malignancy. No evidence of intra-abdominal tumor was seen either from the kidneys, liver, or the adrenal glands. However, a large embolus was lodged in the right main pulmonary artery and extended into the right lower lobe artery (figure 2). No filling defect was identified on either the first pass or the delayed pass through the heart and

Figure 1. Transesophageal echocardiogram showing large undulating mass in the right atrium (RA) (see arrows).

Figure 2. Computed tomography scan of the embolized mass to the right pulmonary artery (see arrow).

Figure 3. Transthoracic echocardiogram after embolization shows no mass in the right atrium (RA). LA = left atrium, RV = right ventricle, LV = left ventricle.

inferior vena cava suggesting that the mass seen in the right atria was a clot that had now embolized to the pulmonary artery. A transthoracic echocardiogram (figure 3) done after resuscitation did not show the previously seen mass in the right atrium. An inferior venacavagram showed no evidence of thrombi in the iliac veins or the vena cava. Nevertheless, an inferior vena cava filter was placed to prevent recurrences after which the patient was discharged to a

nursing home on oral anticoagulation therapy with Coumadin. His remaining course was uncomplicated.

DISCUSSION

Echocardiography is becoming increasingly popular and is being utilized routinely to assess the cardiac function and the chamber sizes.¹⁻⁵ It has now become an extremely valuable tool to diagnose intracardiac masses in patients with atrial fibrillation or flutter. The differential diagnoses of intraatrial masses include thrombi related to atrial fibrillation, valvular vegetations of infective endocarditis and cardiac tumors (the most common being myxomas).^{1,3,5}

The intracardiac masses can also arise from an extension through the inferior or superior vena cava.⁶ Although most of these cases in the vena cava are thrombi related to intravascular access devices,⁷ blood clots in these areas can also develop from tumor invasion from intraabdominal malignancies, namely renal cell, adrenal, and hepatocellular carcinomas.^{5,6} In the case presented, the thrombus in the atrium and the vena cava was not related to an access device or to a tumor, but probably to a thrombus in the lower extremities that was seen during routine echocardiography and later also by venacavagram and computed tomography.⁴

Treatment includes conservative management with anticoagulation using heparin and Coumadin. Other options for treatment include surgical embolectomy with exploration of the atria^{1,3} and thrombolysis.^{1-4,7} The mortality related to untreated right atrial thrombus is around 40%,¹ primarily related to pulmonary embolus.^{1,4} Fortunately, the patient discussed in this case report survived this event and was able to be discharged in stable condition.

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