

ELUSIVE INTRACARDIAC MASS ASSOCIATED WITH MALIGNANCY AND HORMONE USE

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ABSTRACT

A 63-year-old woman presented to the emergency room with an episode of fatigue, confusion, blurred vision, and inability to move her right arm. Computed Tomography (CT) of the chest showed bilateral pulmonary emboli. Magnetic Resonance Imaging (MRI) of the brain showed a small acute infarct in the left parietal cortex. Transthoracic echocardiography revealed a right atrial mass which was further evaluated by transesophageal echocardiography (TEE), which confirmed a large, extremely mobile mass measuring 3 x 0.5 cm extending from the inferior vena cava to the right atrium. Her medical history and diagnostic findings of ovarian malignancy suggested a hypercoagulable state and high likelihood of an intracardiac thrombus. Surgery was contemplated to prevent further embolic events given the size and mobility of the intracardiac cardiac mass. Prior to surgery, patient was started on intravenous (IV) Heparin to prevent further embolic events. A pre-operative TEE done after 4 days of IV Heparin showed complete disappearance of the mass in the right atrium, thus obviating the need for surgery.

Key Words: Echocardiography, Thrombolysis, Lytic Therapy, CT Imaging, Oral Anticoagulation, Intracardiac Mass

INTRODUCTION

Cardiac mass is an abnormal structure that is present either in the heart chamber or with in the adjacent heart tissue. The common causes of cardiac masses are thrombi, valvular vegetations of infective endocarditis, or metastatic tumors from malignancies of breast, lung, kidney or melanoma.¹ Transthoracic echocardiography and transesophageal echocardiography are important for diagnosis of cardiac masses.

CASE REPORT

A 63-year-old woman presented to the emergency room with a transient episode of confusion, blurred vision, and inability to move her right arm. She denied history of fever, weight loss, lower extremity pain, recent travel, or prior thromboembolic events. Her medications included Phenytoin, Lorazepam, Venlafaxine, and Norethindrone. The latter medication had been discontinued

two weeks prior to admission. The family history was unremarkable for thromboembolic disorders.

Physical examination revealed stable vital signs without any facial droop or focal neurological deficits. There were normal breathing sounds over both lungs, and auscultation of heart was essentially normal with normal S1 and S2 and no murmurs. Normal bowel sounds were heard in the abdomen, and there were no signs of thrombophlebitis in the lower extremities. A 12-lead ECG showed sinus rhythm with occasional premature ventricular contractions, prolonged QT interval, and T wave inversions in leads V1, V2 and V3. Linear atelectasis/ fibrosis at right lung base were evident on her chest x-ray. A computed tomography (CT) scan of the chest, abdomen, and pelvis showed several bilateral pulmonary emboli in the lower half of the lungs in addition to two uterine masses found by transvaginal ultrasound. Biopsy of the uterine masses demonstrated stage 1C mucinous carcinoma of the ovary for which she eventually underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, and omentectomy. An IVC filter was placed temporarily prior to this surgery. A CT scan of the head without contrast showed no acute infarct. After a 2D echocardiogram, a Transesophageal Echocardiography (TEE) was performed which showed a large (3.0 X 0.5 cm), extremely mobile multilobulated right atrial mass entering the right atrium from the inferior vena cava (Figure 1).

The exact origin of the mass could not be precisely determined. The differential diagnoses of the intracardiac mass included a thrombus, vegetation, metastatic tumor versus other space-occupying lesions. In view of a high suspicion of thrombus, the patient was started on IV Heparin to prevent further embolic events. Given her history of recent stroke, the patient was referred to cardiothoracic surgery for possible surgical removal of the intracardiac mass. A pre-operative TEE, interestingly, showed that the previously visualized right atrial mass was now absent

Figure 1: TEE Showing A Mobile Mass In The Right Atrium. Arrow Points To Mobile Mass In Right Atrium (RA)

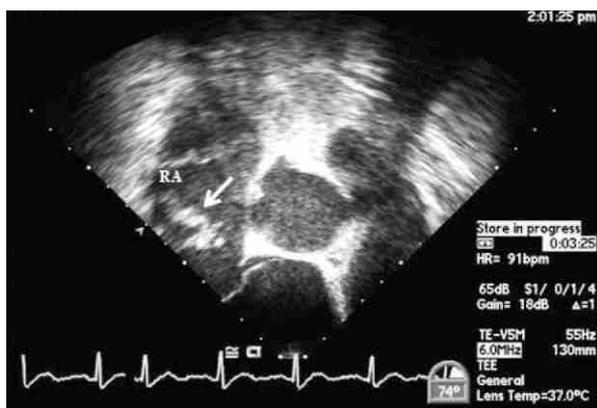
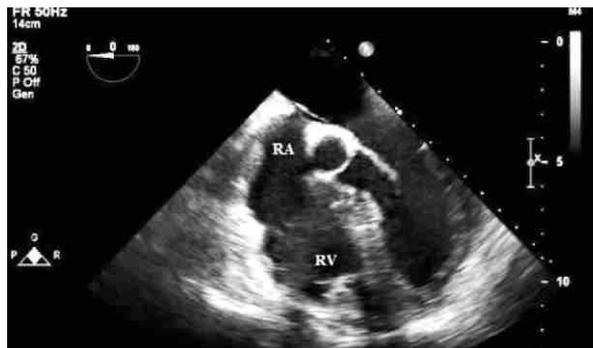


Figure 2: TEE Showing Resolution of Right Atrial Mass After Treatment With Heparine



RA = Right Atrium; RV = Right Ventricle

(Figure 2), indicating either a complete resolution of thrombus with anticoagulation therapy or embolization to the lung with no apparent sequelae.

The mass thus eluded a definitive pathologic examination and diagnosis. The patient was eventually discharged in stable condition and has been doing well in follow-up.

DISCUSSION

The common causes of cardiac masses are thrombi, valvular vegetations of infective endocarditis, or metastatic tumors from malignancies of breast, lung, kidney or melanoma.¹ Primary cardiac tumors are less frequent and are usually benign with atrial myxoma being the most common.

A thrombus appears to be the most common cause of an atrial mass and is most commonly seen in the left atrium attached to the left atrial appendage.^{2,3} Left atrial thrombi are associated with atrial fibrillation, rheumatic mitral valve disease, or low cardiac output states like dilated cardiomyopathy or ischemic heart disease. Individuals with long term indwelling catheters are more prone to develop right atrial thrombi.⁴ Cardiac thrombi can coexist with hypercoagulable states like autoimmune disease, pregnancy and malignancies. Among the autoimmune diseases, antiphospholipid antibody syndrome (with or without SLE) has been associated with cardiac thrombosis and embolism.^{1,5,6,7}

Vegetations due to infective endocarditis appear as mobile, irregular masses attached to the cardiac valves. Predisposing factors for vegetations include structural heart valve defects, prosthetic valves, implanted cardiac devices, long term cardiac catheters, and intravenous drug abusers. Left sided cardiac valves are most commonly involved, and vegetations are located on the atrial side of mitral valve, on the ventricular side of the aortic valve, or the endocardial

surfaces in patients with congenital heart diseases like ventricular septal defects due to turbulence of blood flow. Tricuspid valve vegetations are more common in intravenous drug abusers and with right heart catheters.⁸

Cardiac metastases is 40 fold more common than primary cardiac tumors.⁹⁻¹¹ Common sources include cancers of lung, breast, kidney, lymphoma, and malignant melanoma and are typically diagnosed on autopsy.¹¹ Myxomas constitute about 50% of all primary cardiac tumors and have a female preponderance (2:1).¹² Myxomas originate most commonly in the left atrium in the fossa ovalis (78%) and are predisposed to embolism since they are fragile and mobile in nature.¹³ They tend to be solitary (90%) and attached by a stalk to the interatrial septum.¹⁴⁻¹⁷ Familial cardiac myxomas (10%) are multiple masses seen in young patients with autosomal dominant transmission.¹ They are found in association with Carney complex (extracardiac tumors, hyperpigmented skin lesions, and endocrine abnormalities).^{2,18-20}

The management of intracardiac thrombi remains controversial, ranging from medical to surgical therapies. IV Heparin and r-tpa infusions have been used with variable success.²¹

It is conceivable that in our patient, the ovarian malignancy, which is a hypercoagulable state, predisposed to development of thrombus in the right atrium. Norethindrone use may have also contributed to the hypercoagulable state and, thereby, contributed to an already preexistent hypercoagulable state.

In clinical practice, echocardiography is an extremely valuable diagnostic tool in the diagnosis and evaluation of intracardiac masses; however, the sensitivity and specificity of findings is further increased with TEE, especially when thrombi are located in the atria and atrial appendages.¹¹ Other imaging modalities like Cardiac Magnetic Resonance imaging (MRI), CT imaging, and positron emission tomography (PET) are also routinely used in the diagnosis and further definition of intracardiac masses.²⁰⁻²⁵

CONCLUSION

Intracardiac masses are often detected by echocardiography and other imaging modalities like CT, MRI, and PET. Thrombi are more commonly seen in the atria and treated either conservatively with anticoagulation or lytic therapy or they may need surgical excision if they remain unresolved. A TEE is recommended before surgery to confirm the presence of the mass and to define the size and attachment of the mass to the surrounding structures. The hypercoagulable state of pregnancy and/or the ovarian malignancy most likely led to the development of the presumed thrombus and pulmonary emboli in this case.

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