



# Right Atrial Thrombus: A Differential Diagnosis Dilemma



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## Introduction

Right atrial (RA) thrombus is a rare finding with a multitude of etiologies. It's association with a high mortality rate makes its prompt identification and treatment crucial. This case report adds to the incidence of RA thrombi and the limited, yet critical, set of differential diagnoses confounded by a recent COVID diagnosis.

## Case Description

A 90 year old woman with a history of recently diagnosed COVID-19 infection four months prior and paroxysmal atrial fibrillation no longer on anticoagulation, presented to the emergency department with three days of worsening right lower extremity pain, and confusion. Review of systems largely obtained from family due to confusion, was positive for weakness and immobility since discharge from rehabilitation and a right leg wound. She was found to be hypoxic on room air to 88%, which prompted evaluation for pulmonary embolism. Labs were pertinent for elevated BNP of 1677. CT angiogram showed multiple right atrial filling defects likely representing thrombi along with a dilated pulmonary trunk suggesting pulmonary hypertension without signs of overt pulmonary embolism. Ultrasound of the lower extremities revealed no evidence for deep vein thrombosis bilaterally. She remained hemodynamically stable other than requiring supplemental oxygen. She was treated with intravenous heparin, oxygen, and later transitioned to apixaban. Transthoracic echocardiogram found two distinct homogeneous masses without mobile elements in the right atrium and a severely dilated right atrium. Of note, the patient was in atrial fibrillation for the duration of her hospital stay. At this point, patient's care was transitioned to comfort measures given the patient's frailty and comorbidities.

## Discussion

Right atrial thrombi are a relatively rare finding and are typically diagnosed incidentally on transthoracic echocardiograms. The overall incidence of right atrial thrombosis is unknown, but risk factors have been documented in literature. It is commonly associated with conditions favoring atrial thrombosis such as atrial fibrillation/flutter and risk factors that induce thrombosis via vascular endothelial damage such as pacemakers and central venous catheters. The differential is narrow, but each portends its own risk of mortality including atrial myxoma, clot in transit, thrombosis, and malignancy. Primary atrial thrombi are typically immobile, while secondary atrial thrombi often originate from the deep veins and are mobile--making them at risk for embolization to the pulmonary arteries.

This patient had multiple factors that put her at risk for the finding of right atrial thrombus. Primarily, her existing paroxysmal atrial fibrillation, for which she was not on anticoagulant therapy. She additionally exhibited the three factors of Virchow's triad: vessel wall injury, venous stasis given her immobility, and hypercoagulability as her recent COVID-19 infection heightens her risk of thromboembolism based on current research. The greatest concern is the potential for her clots, which were immobile, to embolize to the pulmonary trunk, leading to right heart strain and significant hemodynamic instability. Management necessitates the need for, at minimum, anticoagulation, followed by thrombolysis or mechanical thrombectomy to reduce morbidity and mortality.

## Literature Cited

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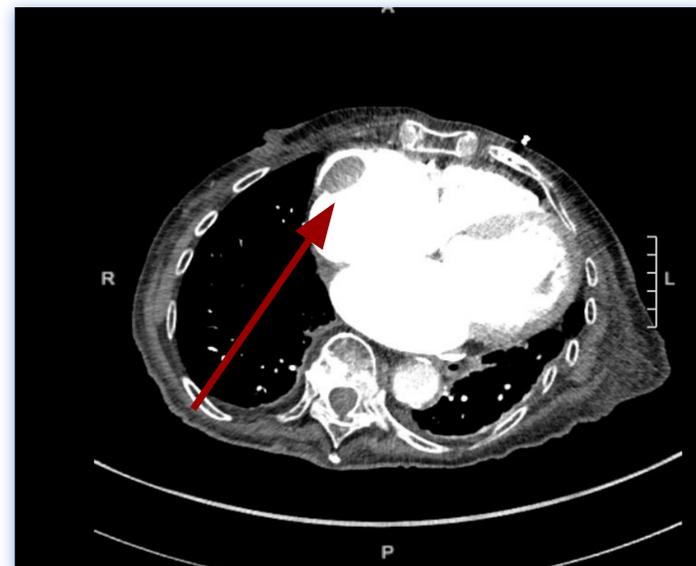


Figure 1: Filling Defect of the Right Atrium

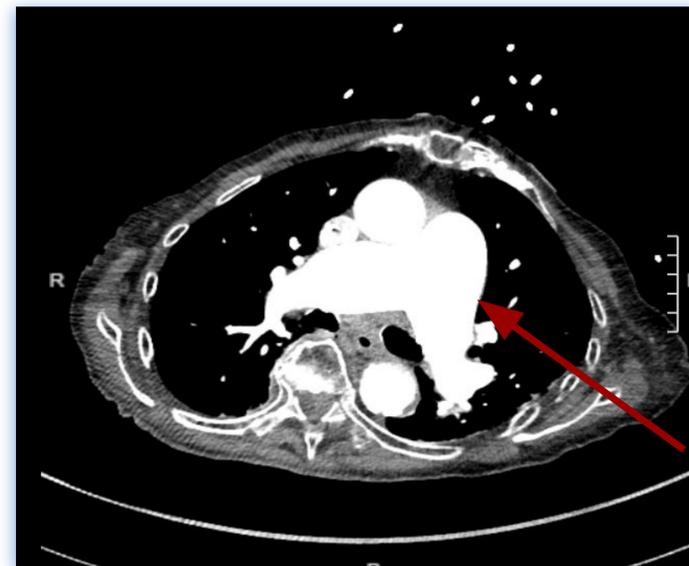


Figure 2: Dilation of the Pulmonary Trunk