

## Right Atrial Thrombosis with Inferior Vena Cava Extension in Chronic Obstructive Pulmonary Disease: A Case Series

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### Abstract

**Background:** Right atrial (RA) thrombosis, particularly in association with inferior vena cava (IVC) thrombosis, is rare and potentially fatal. Known causes include cardiac interventions, malignancies, and congenital anomalies. However, data on conservative management of idiopathic RA thrombosis, especially in the setting of chronic obstructive pulmonary disease (COPD), is limited.

**Aim:** To describe the clinical presentation, management, and outcomes of three patients with RA and IVC thrombus without conventional thrombotic risk factors.

**Methods:** This case series includes three male smokers with underlying COPD presenting with acute breathlessness. 2D echocardiography revealed thrombi extending from the IVC into the RA. Routine blood parameters were normal, and thrombophilia screening was negative.

**Results:** All patients were managed conservatively with intravenous heparin followed by oral anticoagulation. Serial echocardiograms showed complete thrombus resolution within 14 to 31 days. No complications or embolic events were recorded. COPD management was optimised.

**Conclusion:** COPD may act as a prothrombotic milieu leading to RA and IVC thrombosis in the absence of classical risk factors. Conservative anticoagulation therapy can result in complete resolution. Larger studies are needed to further explore this association and optimise treatment strategies.

**Key words:** Right atrial thrombus, inferior vena cava, COPD, anticoagulation.

### Introduction

Virchow's triad describes the three principal mechanisms for thrombus formation: endothelial injury, stasis of blood flow, and hypercoagulable state. Right atrial thrombosis is a rare and serious clinical condition, particularly when associated with inferior vena cava (IVC) thrombus, due to the risk of pulmonary embolism. Documented causes include heart failure, congenital heart disease, invasive interventions, malignancies, and thrombophilic disorders. However, right atrial thrombus without these aetiologies is uncommon. This case series highlights three such instances in male patients with chronic obstructive pulmonary disease (COPD) and a history of smoking, with no other identifiable risk factors.

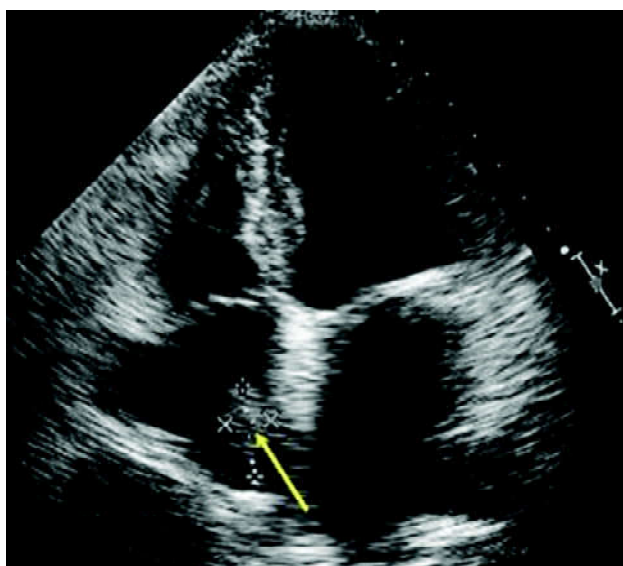
### Case Reports

#### Case 1

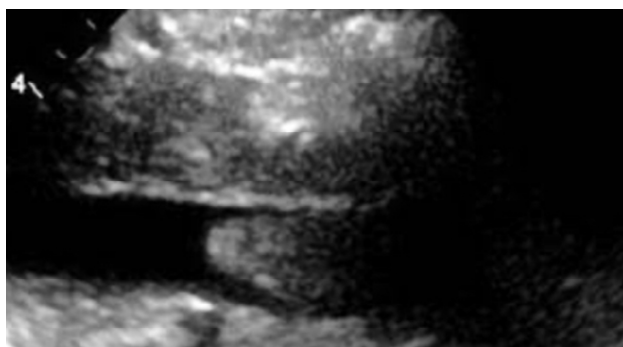
A 56-year-old male with a 30-pack-year smoking history and GOLD Stage 3 COPD presented with MMRC Grade 4 dyspnoea. Initial chest radiograph showed pulmonary oedema. 2D echocardiography revealed a thrombus in the IVC extending into the RA, with diastolic dysfunction and pulmonary hypertension. Thrombophilia work-up, including Protein C and S, was negative. The patient was treated with intravenous heparin (5,000 IU QID) for 7 days, followed by oral dabigatran from day 5. COPD was managed concurrently. Follow-up echo on day 15 showed complete thrombus resolution.

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**Fig. 1:** Showing thrombus in the right atrium.



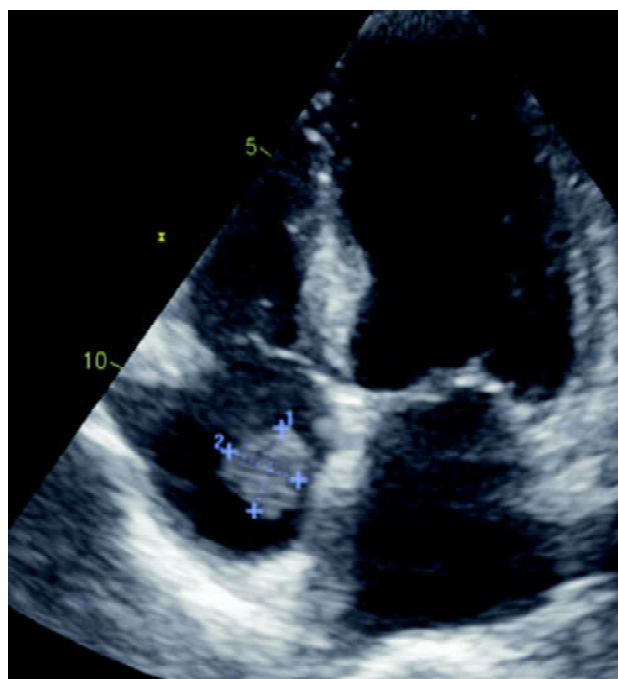
**Fig. 2:** Showing IVC thrombus.

## Case 2

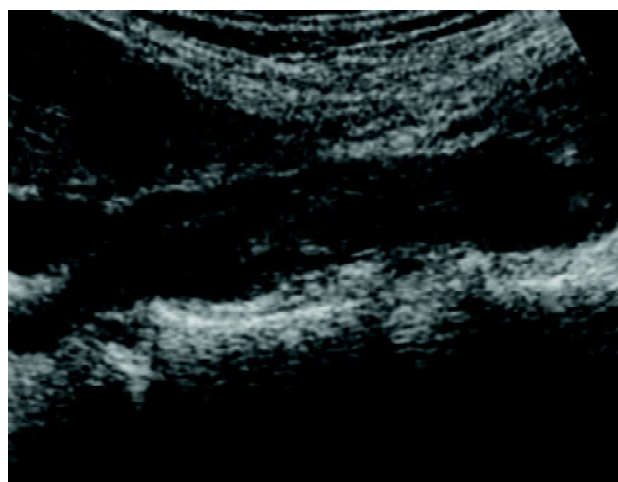
A 60-year-old male smoker with GOLD stage 3 COPD presented with MMRC Grade 3 dyspnoea and signs of right heart failure. 2D echo revealed an IVC thrombus extending into the RA. Lab investigations were unremarkable. The patient received intravenous heparin for 7 days, bridged to oral anticoagulation from day 5. RA thrombus resolved by day 31; IVC thrombus resolved by day 16.

## Case 3

A 75-year-old male smoker presented post-operatively with dyspnoea after Ray's amputation for diabetic foot ulcer. Raised jugular venous pressure was noted, but ECG was unremarkable. 2D echo revealed an IVC thrombus extending to the tricuspid valve with pulmonary hypertension. Intravenous heparin was initiated, followed by apixaban. IVC thrombus resolved by day 10, and RA



**Fig. 3:** Showing thrombus in the right atrium.



**Fig. 4:** Showing IVC thrombus.

thrombus by day 14.

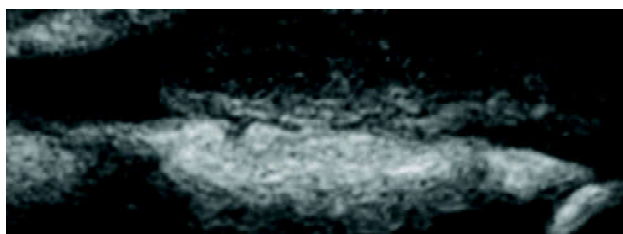
## Discussion

Right atrial thrombosis is a rare clinical entity often overlooked in patients with dyspnoea, where attention is frequently directed toward left-sided cardiac pathology. All three patients in this series were elderly male smokers with COPD, fulfilling elements of Virchow's triad through chronic inflammation and potential endothelial dysfunction.

In contrast to reported aetiologies – such as central venous



**Fig. 5:** Showing thrombus in the right atrium.



**Fig. 6:** Showing IVC thrombus.

catheter use, pacemaker leads, malignancies, Behcet's disease, and congenital anomalies – none of the patients had these risk factors. Notably, none of the patients required surgical intervention or IVC filter placement. While some studies have reported complications with heparin use in IVC thrombus, all three patients in this series tolerated bridging anticoagulation without bleeding or embolic events.

Due to resource constraints, advanced imaging such as MRCT was not used, though its utility in prognosticating RA thrombus and potential pulmonary embolism is well-established.

These cases suggest COPD-associated chronic inflammation may create a prothrombotic environment sufficient for spontaneous thrombus formation.

Conservative anticoagulation may be a viable treatment option in such scenarios.

## Conclusion

Right atrial thrombus in association with IVC thrombosis is a rare and often under-recognised cause of acute dyspnoea. This case series underscores the potential role of COPD and smoking in creating a hypercoagulable state. In the absence of traditional risk factors, conservative management with anticoagulation may be effective and safe. Larger cohort studies are warranted to further explore this association and determine optimal management protocols.

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