

Pulmonary Vein Thrombosis: A Rare and Underdiagnosed Condition

Dehayni Fariss*, Yassine Kassab Alia, Neftah Ismail, Messaoud Ola, Iraqi Houssaini Zaynab, Jroundi Laila, El Aoufir Omar

Department of Emergency Radiology, Ibn Sina Hospital, Faculty of Medicine and Pharmacy of Rabat, Morocco

*Corresponding author: Dehayni Fariss, Department of Emergency Radiology, Ibn Sina Hospital, Faculty of Medicine and Pharmacy of Rabat, Morocco

Received: September 22, 2025

Published: October 24, 2025

Case Description

A 74-year-old woman was admitted in shock. Past medical history includes end-stage renal disease on chronic hemodialysis and atrial fibrillation on acenocoumarol (Sintrom). She presented with failed hemodialysis due to hemodynamic instability, hypotension (80/40 mmHg), tachycardia (120 bpm), prolonged bed rest, and chest pain. Echocardiography revealed right ventricular dilatation with paradoxical septal motion.

Discussion

Pulmonary Vein Thrombosis (PVT) is rare, often underdiagnosed, yet potentially life-threatening [1].

Its causes can be divided into postoperative factors—such as lobectomy, lung transplantation, radiofrequency catheter ablation, and arteriovenous malformation—and non-postoperative factors, including primary or secondary lung cancer, metastases, chest trauma, hiatal hernia, pulmonary aspergillosis, and omalizumab therapy [2,3]. Some cases remain idiopathic, often in the context of hemoglobinopathies [1-3].

Pathophysiology

After surgery, PVT may develop due to turbulent blood flow or stasis in the residual vein stump [2]. In cancer-related cases, the mechanism is less clear but may involve tumor extension into the vein, endothelial injury from tumor invasion, or a hypercoagulable state [1]. Increased pulmonary venous pressure can lead to compensatory pulmonary arterial vasoconstriction, raising pulmonary artery pressure and causing right ventricular expansion [3].

Clinical presentation

Symptoms are non-specific—dyspnea, cough, and hemoptysis—often mimicking pulmonary embolism [1,3]. Hemodynamic signs are also non-specific, and the condition may be asymptomatic, especially in older patients [1,2].

Diagnosis

Chest CT angiography is the preferred imaging method, typically showing a well-defined, hypodense endoluminal thrombus in a pulmonary vein [1,3], outlined by contrast but not enhancing after injection [1].



Figure 1: Axial CT scan angiography (a), coronal (b) and sagittal (c) reconstruction, showing an endoluminal thrombi in the pulmonary vein (arrow).

Transthoracic or transesophageal echocardiography can visualize atrial thrombi [3] and is particularly useful for postoperative follow-up [3].

MRI helps distinguish bland from tumor thrombi: bland thrombi show high T1/T2 signal in the acute phase and low T2 (“flow void”) in chronic stages, without enhancement. Tumor thrombi may show vessel wall invasion, restricted diffusion, and post-contrast enhancement [1].

Complications

Delayed diagnosis or treatment can lead to severe outcomes: pulmonary hypertension with shock, pulmonary infarction, edema, fibrosis, massive hemoptysis, renal infarction, or ischemic stroke from embolization [1, 3].

Management

There is no clear consensus on treatment [1, 3]. In most cases, anticoagulation is given unless bleeding is present.

For postoperative thrombi, antibiotics plus anticoagulation are

recommended, with thrombectomy in severe cases; spontaneous resolution is possible.

For tumor thrombi, anticoagulation is combined with tumor-specific therapy, and surgical resection may be considered if the tumor is operable [1].

References

1. Chaaya G, Vishnubhotla P. Pulmonary Vein Thrombosis: A Recent Systematic Review. *Cureus*, 2017; 9(1): e993. doi: 10.7759/cureus.993.
2. Paul D Stein, James E Denier, Lawrence R Goodman, Fadi Matta, Mary J. Hughes, Pulmonary vein thrombosis in patients with medical risk factors, *Radiology Case Reports*, 2018; 13(6): Pages 1170-1173. <https://doi.org/10.1016/j.radcr.2018.07.031>.
3. Muhammad Asim Rana, Nicholas Tilbury, Yashwant Kumar, Habib Ahmad, Kamal Naser, Ahmed F Mady, et al. Idiopathic Pulmonary Vein Thrombus Extending into Left Atrium: A Case Report and Review of the Literature, 2016. <https://doi.org/10.1155/2016/3528393>.