

# Inferior Vena Cava Thrombosis Secondary to Infective Endocarditis Associated with Pulmonary Alveolar Hemorrhage and Retroperitoneal Fibrosis: A Rare Case Report

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DOI: <https://doi.org/10.36347/sjmcr.2025.v13i10.082>

| Received: 15.08.2025 | Accepted: 22.10.2025 | Published: 25.10.2025

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## Abstract

## Case Report

Infective endocarditis is a serious condition that may cause atypical systemic complications beyond the cardiac structures. We report the case of a 65-year-old male admitted for fever and hemoptysis. Chest CT revealed bilateral alveolar and ground-glass opacities consistent with diffuse alveolar hemorrhage. Abdominopelvic CT demonstrated a regular thrombus located at the iliac bifurcation of the inferior vena cava, associated with a retroperitoneal fibrotic process encasing the great vessels and the development of collateral venous pathways. No edema of the lower limbs was noted. Blood cultures identified *Staphylococcus aureus*, and transthoracic echocardiography showed tricuspid vegetations, confirming the diagnosis of right-sided infective endocarditis. The patient received targeted intravenous antibiotic therapy and anticoagulation, leading to gradual clinical improvement. This case highlights a rare combination of complications venous thrombosis, pulmonary alveolar hemorrhage, and retroperitoneal fibrosis secondary to infective endocarditis. Radiologic imaging was essential in detecting these findings and guiding multidisciplinary management.

**Keywords:** Infective Endocarditis, Inferior Vena Cava Thrombosis, Iliac Bifurcation, Alveolar Hemorrhage, Retroperitoneal Fibrosis, Collateral Circulation, Hemoptysis, Radiology.

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## INTRODUCTION

Infective endocarditis (IE) is a severe condition characterized by microbial infection of the endocardial surface of the heart. Although cardiac manifestations are well known, extracardiac complications may occur and can significantly influence prognosis. These systemic manifestations result from septic embolization, immunologic reactions, or inflammatory vascular injury, and may involve multiple organs.

Thrombosis of the inferior vena cava is an exceptionally rare complication of infective endocarditis, particularly when localized to the iliac bifurcation. Its occurrence may be linked to endothelial injury and hypercoagulable states associated with infection. Pulmonary involvement is more frequent and can manifest as septic emboli or, more rarely, diffuse alveolar hemorrhage secondary to inflammatory vascular damage. Retroperitoneal fibrosis associated with vascular thrombosis adds another level of diagnostic and therapeutic complexity, as it may result from chronic inflammation and tissue reaction around the great vessels.

We report a rare case of inferior vena cava thrombosis at the iliac bifurcation secondary to infective endocarditis, associated with pulmonary alveolar hemorrhage and retroperitoneal fibrosis. This observation highlights the role of imaging in identifying atypical systemic complications of endocarditis and underlines the importance of a multidisciplinary approach to patient management.

## CASE REPORT

A 56-year-old male with no significant past medical history presented with fever and episodes of hemoptysis evolving over several days. There was no history of lower limb edema, chest pain, or recent invasive procedures. Physical examination revealed a febrile patient with normal oxygen saturation and no signs of peripheral congestion. Cardiac auscultation revealed a systolic murmur over the tricuspid area.

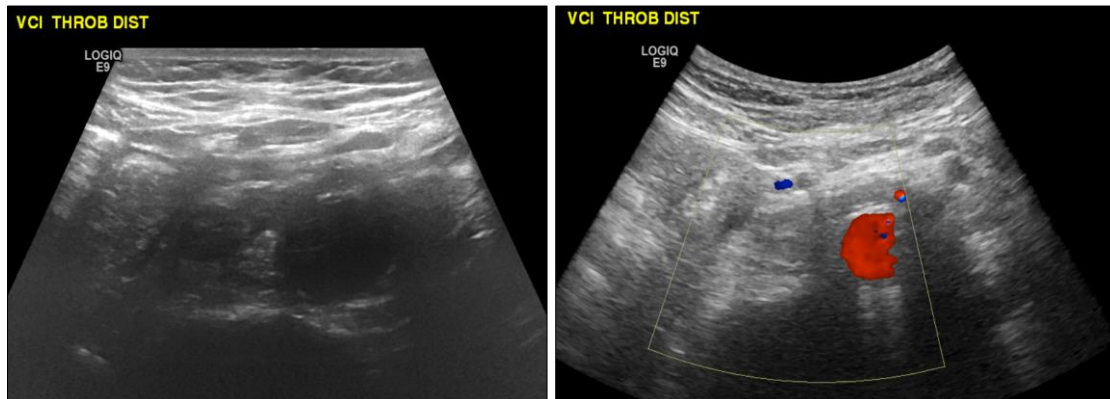
### Imaging Findings

An abdominal ultrasound was initially performed, showing a hypoechoic, non-compressible structure at the iliac bifurcation of the inferior vena cava,

**Citation:** H. Tadili, A. Outrah, Y. Bouktib, A. EL Hajjami, B. Boutakioute, M. Ouali Idrissi, N. El El Idrissi Ganouni. Inferior Vena Cava Thrombosis Secondary to Infective Endocarditis Associated with Pulmonary Alveolar Hemorrhage and Retroperitoneal Fibrosis: A Rare Case Report. Sch J Med Case Rep, 2025 Oct 13(10): 2530-2532.

suggestive of a thrombus, with no evidence of lower limb venous stasis. Contrast-enhanced computed tomography (CT) of the abdomen and pelvis confirmed a regular

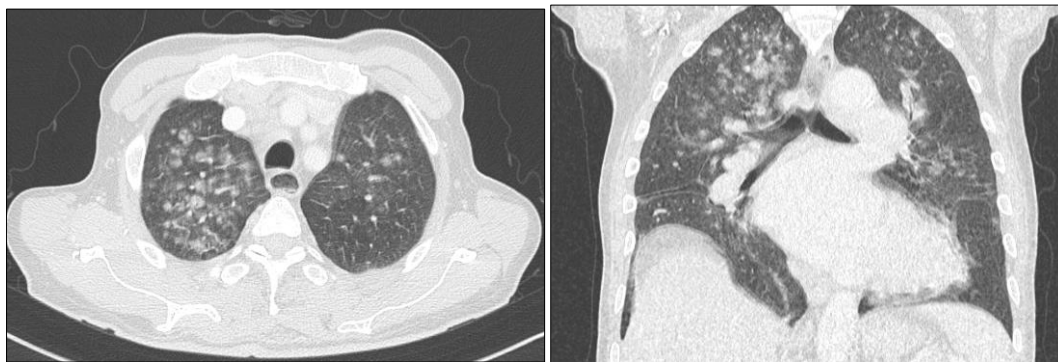
thrombus located at the iliac bifurcation of the inferior vena cava.



**Figure 1: Ultrasound of the peri umbilical region showing an endoluminal hypoechoic thrombus was visualized within the inferior vena cava, with absence of color Doppler flow**

Thoracic CT demonstrated multiple bilateral ground-glass opacities and areas of alveolar

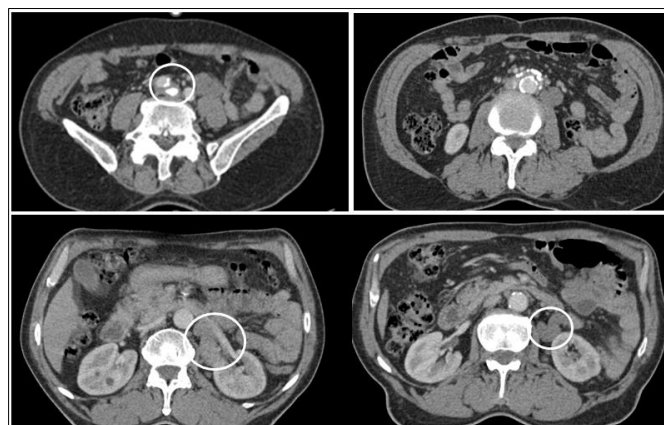
consolidation consistent with diffuse alveolar hemorrhage. No pulmonary emboli were detected.



**Figure 2: Axial and coronal MPR of thoracic CT showing multiple bilateral ground-glass opacities and areas of alveolar consolidation consistent with diffuse alveolar hemorrhage**

Contrast-enhanced computed tomography (CT) of the abdomen and pelvis confirmed a regular thrombus located at the iliac bifurcation of the inferior vena cava, associated with a retroperitoneal fibrotic process

encasing the great vessels and the presence of collateral venous circulation. There was no extension of the thrombus to the renal veins or hepatic segment of the IVC.



**Figure 3: Axial MPR of abdominal CT showing a fibrous sheath encasing the aorta and the inferior vena cava at the level of its iliac bifurcation, suggestive of retroperitoneal fibrosis, associated with collateral venous circulation draining toward the left renal vein**

## Management and Evolution

The patient received targeted intravenous antibiotic therapy based on the antibiogram, combined with anticoagulation. Clinical and radiologic follow-up showed gradual regression of pulmonary and retroperitoneal findings, with no recurrence of hemoptysis or thrombotic extension.

## DISCUSSION

Infective endocarditis (IE) is a systemic disease that can lead to numerous vascular complications, including thromboembolic and inflammatory phenomena. Thrombosis of the inferior vena cava (IVC) is exceptionally rare and usually results from endothelial injury and a hypercoagulable state induced by infection. In this case, the localization of the thrombus at the iliac bifurcation and the absence of lower limb edema were explained by the rapid formation of collateral venous pathways ensuring adequate drainage toward the left renal vein.

Pulmonary involvement in IE most commonly results from septic emboli, but diffuse alveolar hemorrhage remains an unusual presentation. It reflects capillary injury caused by inflammatory or immune-mediated mechanisms, as seen in our patient who presented with hemoptysis and CT evidence of bilateral ground-glass opacities.

The presence of retroperitoneal fibrosis (RPF) in this setting likely represents a secondary inflammatory response to the thrombotic process. The fibrous sheath encasing the aorta and IVC, along with the collateral circulation observed on CT, supports this interpretation.

Imaging plays a pivotal role in identifying these atypical systemic complications. Doppler ultrasound helps detect venous thrombosis, while CT provides a comprehensive evaluation of vascular, pulmonary, and retroperitoneal involvement. Management relies on targeted antibiotic therapy, anticoagulation, and close imaging follow-up.

This case illustrates a rare and complex association between infective endocarditis, ilio caval thrombosis, alveolar hemorrhage, and retroperitoneal fibrosis, emphasizing the importance of imaging in diagnosis and multidisciplinary care.

## CONCLUSION

This observation illustrates a rare and complex systemic manifestation of infective endocarditis, combining ilio caval thrombosis, diffuse alveolar hemorrhage, and retroperitoneal fibrosis. These findings underline the multifactorial pathophysiology of endocarditis, in which inflammatory, immune, and thrombotic mechanisms may coexist and lead to atypical presentations.

Radiologic imaging played a central role in diagnosis, providing essential information about the extent of vascular involvement, pulmonary damage, and fibrotic tissue response. The combination of ultrasound and CT enabled a comprehensive evaluation and guided therapeutic decisions.

Early identification and multidisciplinary management—including targeted antibiotic therapy, anticoagulation, and close radiologic follow-up—are crucial to improve outcomes in such rare and potentially severe complications.

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