

A calcified lesion within the inferior vena cava presenting as recurrent pulmonary emboli

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The case of a 49-year-old male patient who presented with recurrent pulmonary emboli secondary to a calcified lesion within his inferior vena cava is presented. The diagnosis and relevant literature is reviewed. This is the first time that calcification within the inferior vena cava has presented this way in adults, and it is important to consider this diagnosis in patients presenting with recurrent pulmonary emboli. (*J Vasc Surg* 2011;53:204-5.)

A 49-year-old male patient initially presented with dyspnea in September 2008. He had no significant past medical history or risk factors for thromboembolic disease. Initial hematological investigations were unremarkable, and bilateral leg duplex ultrasound scans excluded deep vein thrombosis. There was no evidence of lower limb edema or venous hypertension. Abdominal ultrasound revealed diffuse fatty infiltration of the liver but no other abnormalities. Continuation of symptoms resulted in computed tomography (CT) pulmonary angiography, which demonstrated an acute pulmonary embolus in the vessels supplying the right lower lobe and an additional small embolus at the origin of the left lower lobe medial segmental artery. These were associated with areas of chronic scarring at the left lung base. He was commenced on warfarin for a period of 6 months.

After discontinuation of anticoagulation and normalization of his international normalized ratio, he developed further dyspnea, and a further pulmonary embolus was identified. A subsequent abdominal and pelvic CT scan revealed an amorphous, serpiginous intraluminal calcified mass within the inferior vena cava (IVC). It originated within the left internal iliac vein and extended cranially to just below the renal vein confluence. Multiple foci of low attenuation consistent with thrombus were seen to be adhered to its surface (Figs 1-3). This lesion was identified as the underlying cause for the emboli. The possibility of placing an IVC filter or performing a caval thrombectomy was considered, but the absence of recurrent symptoms and good patient compliance with anticoagulation resulted in the decision to treat with lifelong warfarin. If recurrent symptoms or significant side effects from the warfarin had been experienced, then an IVC filter or surgical thrombectomy would have been considered.

DISCUSSION

Despite being first described at postmortem in 1769 by Morgagni, IVC calcification in adults remains very rare.¹ Calcified thrombus within the inferior IVC was first reported in 1961 and is recognized primarily in pediatric populations.² A right-sided "bullet shaped" opacity on plain abdominal film is the classical radiological appearance.² Abdominal malignancy, adrenal hemorrhage, coagulopathy, dehydration, infection, and structural anomalies have been implicated in its aetiology.³⁻⁶

IVC calcification in adults is exceptionally rare, with only a small number of cases described. A case report identifies total calcific occlusion of the IVC 2 cm below the renal veins extending to the formation of the IVC at the joining of the common iliac veins in a 39-year-old man. This was associated with a left leg deep venous thrombosis.¹ The authors identify CT as the gold standard non-invasive technique in addition to plain abdominal radiographs, which will accurately locate the lesion. Cantisani et al describe the finding of extensive calcification of the IVC in a woman with antiphospholipid syndrome and a pancreatic pseudocyst secondary to pancreatitis.⁴

Thrombosis within the IVC is a more common condition, usually associated with external compression or invasion from an abdominal malignancy but also may be associated with inflammatory and iatrogenic aetiologies.⁷ Pulmonary embolism is a recognized sequelae of IVC thrombosis and carries significant morbidity and mortality.⁸

However, systemic embolization of a calcified thrombus within the IVC has only been reported once in the literature. D'Souza et al reported the findings of a calcified density within the right upper quadrant indicative of calcified IVC thrombus in an 8-month-old infant with transposition of the great vessels. This was associated with bilateral cerebral infarctions located to the frontoparietal areas. The authors suggest that venous catheterization during treatment may have caused sufficient trauma to the caval wall to explain the development of the calcified thrombus.⁹ They explain the resulting cerebral infarction may have been due to embolization from the calcified IVC thrombus direct to the brain secondary to the abnormal great vessel configuration. Embolization to the pulmonary circulation from a calcified lesion within the IVC, despite being posited as

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Fig 1. Computed tomography image showing calcification within the inferior vena cava (para-sagittal image).



Fig 2. Computer tomography image showing calcification within the inferior vena cava (horizontal image).

theoretically possible, has not been previously reported.⁹ The recurrent embolization to the pulmonary vasculature after stopping anticoagulation as described in this case further demonstrates the embolic potential of these lesions and the associated morbidity.

The American College of Chest Physicians recommends long-term anticoagulant therapy for patients with a second episode of unprovoked pulmonary embolism. Furthermore, they advise against the routine use of IVC filters in addition to anticoagulants in pulmonary embolism.¹⁰ Therefore, we suggest that initial management of symptomatic IVC calcification, such as in this case, should consist of long-term anti-coagulation. However, the development of recurrent symptoms while successfully anti-coagulated should lead to consideration of additional treatment options, including IVC filter and surgical thrombectomy.



Fig 3. Computer tomography image showing calcification within the inferior vena cava (coronal image).

CONCLUSION

We have described the first case of recurrent pulmonary emboli from a calcified lesion within the IVC in an adult. We suggest that this rare diagnosis should be considered in cases of recurrent pulmonary emboli and that CT should be the first-line investigation.

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