



## Case report

# A fractured inferior vena cava filter strut migrating to the left pulmonary artery



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## ABSTRACT

Inferior vena cava filters are increasingly used in patients with recurrent venous thromboembolism who are contraindicated to anticoagulation. Migration of a broken strut to the pulmonary artery is a very rare complication of these filters. We report the case of an 83-year-old female who experienced this complication with the migratory strut remaining in the same position for years. This case provides evidence that such filters probably have higher rates of complications than what has been thought that remain asymptomatic. The indications and the management of complications of such devices need to be studied further.

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## 1. Introduction

Inferior vena cava (IVC) filters have been utilized in the prevention of pulmonary embolism (PE) in patients with proximal deep vein thrombosis (DVT) where anticoagulation is contraindicated [1]. The use of these filters may be associated with rare but potentially life-threatening complications. We report a case of fractured IVC filter strut migration to the pulmonary vasculature and we highlight possible management of such cases.

## 2. Case report

In 06/2008, an 83-year-old, Caucasian female with a past medical history of Alzheimer's disease, coronary artery disease, hypertension, and hyperlipidemia presented with acute shortness of breath to the University of Texas Medical Branch emergency department. Computed tomography (CT) of the chest with intravenous (IV) contrast showed a saddle embolus with multiple bilateral, central, and peripheral pulmonary emboli. She was diagnosed with acute, unprovoked PE. Hypotension requiring monitoring by the intensive care unit complicated her hospital course. Transthoracic echocardiogram showed moderately reduced

left ventricular systolic function with an ejection fraction of 30–35%, moderately dilated right ventricle (RV), and mildly reduced RV function. Right ventricular systolic pressure was 40–45 mm Hg. Bilateral doppler ultrasound of lower limbs revealed bilateral DVTs. She received anticoagulation therapy and, due to the high risk of further PEs in the future, an interventional radiologist deployed an infrarenal vena cava filter (G-2 recovery retrievable filter). Six months later, a repeated CT scan of the chest with IV contrast showed an almost complete resolution of the PE. However, the patient remained on chronic oral anticoagulation and there was no discussion of retrieving the IVC filter.

In 9/2010, the patient presented to the internal medicine clinic with left sided pleuritic chest pain. Unchanged electrocardiogram and negative cardiac biomarkers ruled out acute coronary syndrome. Chest CT scan with IV contrast showed a high-density linear structure extending into the superior segmental and superior lingular segmental pulmonary artery branches and the left lower lobe (Fig. 1). This most likely represented a broken IVC filter strut. A chest x-ray shows the same finding (Fig. 2). Abdominal CT scan with IV contrast revealed the infrarenal IVC filter with missing struts. Fig. 3 shows a comparison between two abdominal CTs. The CT scan taken in 12/2008 shows the IVC filter with 12 struts while the CT taken in 9/2010 shows only 11 struts. The patient was diagnosed with stable chronic angina pectoris and her chest pain improved with nitroglycerine. As the displacement was asymptomatic and the removal procedure holds risk of complications, a multidisciplinary team chose a conservative approach and left the IVC filter strut and the original IVC filter in place. The patient was managed

Abbreviations: CT, computed tomography; DVT, deep vein thrombosis; IV, intravenous; IVC, inferior vena cava; PE, pulmonary embolism; RV, right ventricle.

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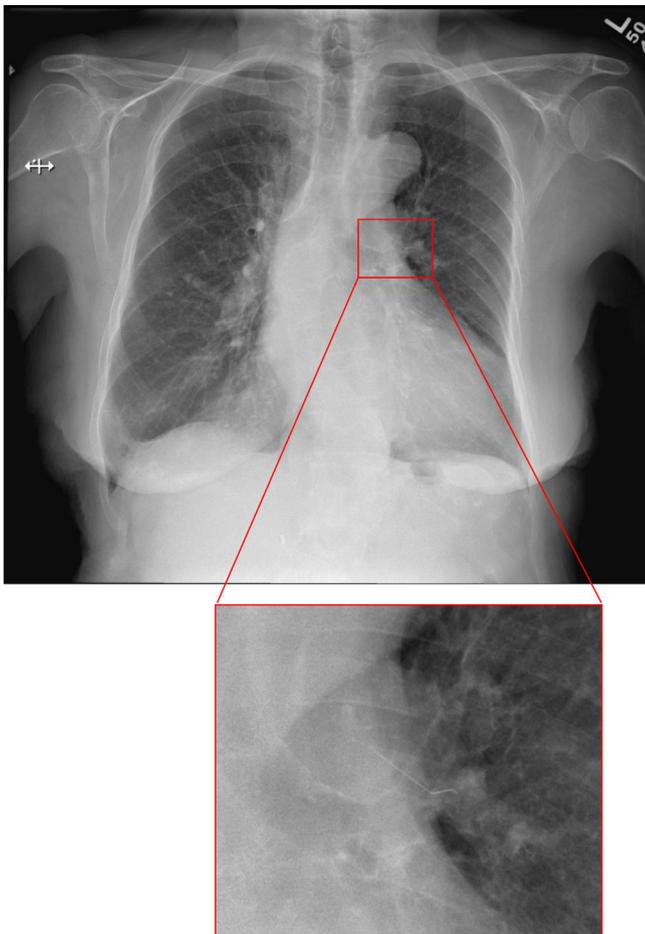
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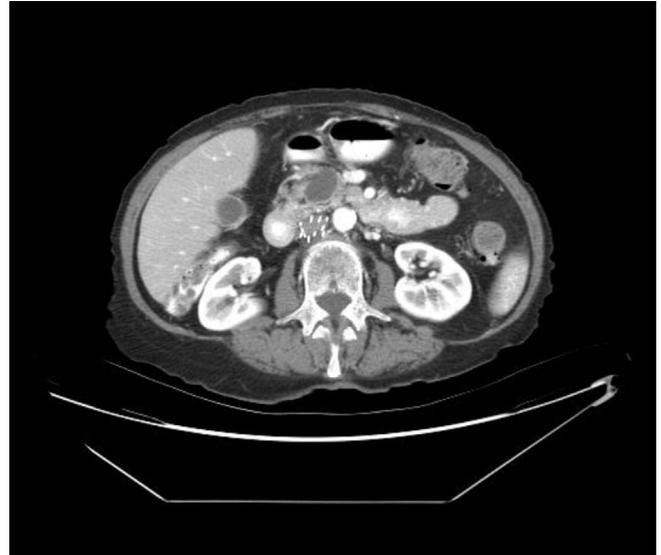
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**Fig. 1.** Red arrow pointing to the IVC filter strut at the pulmonary vasculature. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



**Fig. 2.** Chest x-ray showing a foreign linear structure at the left upper part of the lung (structure better seen in the magnified image on the right).



**Fig. 3.** The abdominal CT shown above was in 12/2008 showing 12 struts as compared to the bottom CT abdomen taken on 9/2010 showing only 11 struts.

with chronic oral anticoagulation. Over the next 4 years the patient's symptoms were monitored through regular clinic follow ups and serial chest CT scans. As of 2/2014, the patient remained asymptomatic and there was no evidence of any complications, including changes in the position of the fractured and migratory strut.

### 3. Discussion

A study conducted from 1980 to 1990 in Olmsted County, Minnesota, United States estimated the incidence of venous thromboembolism in the USA as 70 per 100,000 person-years [2]. Anticoagulation is still the mainstay of treatment for venous thromboembolism [1]. According to the recent American College of Chest Physicians (ACCP) 2012 guidelines, IVC filters are only indicated with the diagnosis of acute proximal DVT or acute PE with the contraindication to anticoagulation [1]. No randomized studies

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