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IT WASN'T CUPID: MULTIMODALITY IMAGING OF INFERIOR VENA CAVA FILTER FRACTURE WITH STRUT MIGRATION TO THE INTERVENTRICULAR SEPTUM

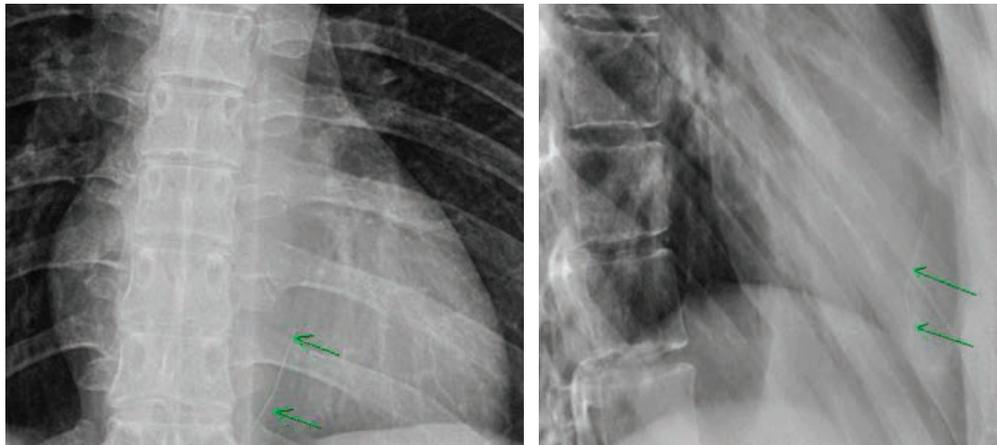
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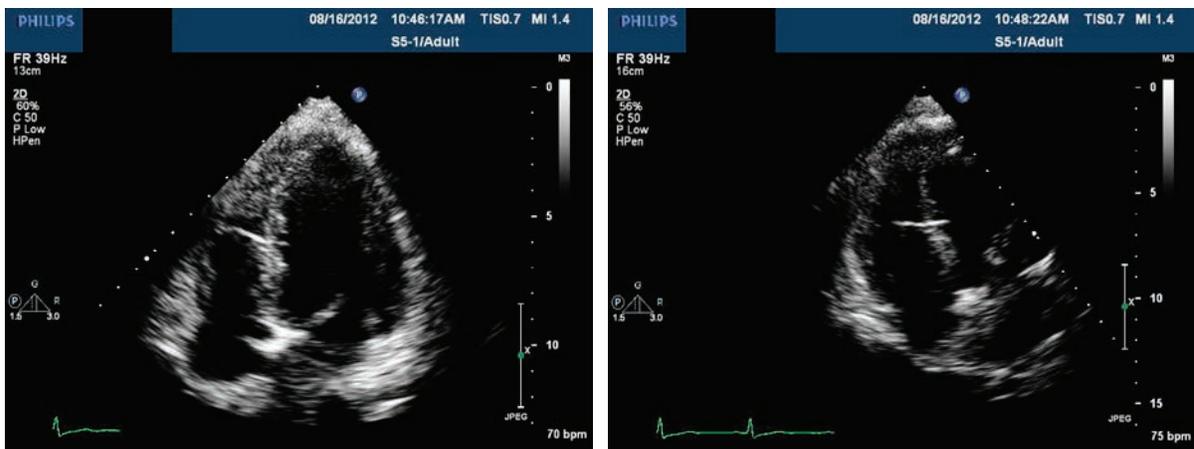
Case Report

Inferior vena cava (IVC) filter fracture with strut embolization is a rare and serious complication of IVC filters.¹ Embolization to the heart is associated with grave consequences, including tamponade, ventricular arrhythmias, and sudden death. Currently, a paucity of literature consisting of case reports and case series exists to guide the clinician in diagnosis and management decisions. Transthoracic echocardiography and

fluoroscopy are the imaging modalities routinely used to guide the clinician. However, these techniques may have insufficient resolution to establish the correct diagnosis and determine the appropriate treatment strategy. Multidetector computed tomography may have superior diagnostic value in these patients. Here, we present a case demonstrating the importance of multimodality imaging in assisting diagnosis and treatment decisions in patients with IVC filter fracture.



Figures 1 and 2. Chest X-ray. A 26-year-old paraplegic woman referred to the cardiology clinic for chest pain was found to have a metallic density in her heart on chest X-ray (both figures). A recoverable inferior vena cava filter had been placed prophylactically at another hospital 3 years ago following an automobile accident. Anteroposterior view (left) and lateral view (right) reveal a metallic density in the heart (green arrows).



Figures 3 and 4. Transthoracic echocardiogram. Apical 4-chamber view (left) and apical 5-chamber view (right) of her transthoracic echocardiogram revealed a metallic wire in the mid-muscular interventricular septum. It is unclear whether the wire extends into the left ventricular cavity. Also, refer to Online Videos 1 and 2 that correspond to the left and right panels, respectively.

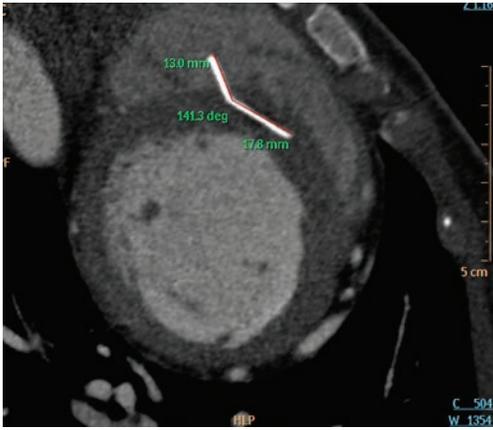


Figure 5. Cardiac multidetector computed tomography (MDCT). Cardiac MDCT revealed that about two-thirds of the metallic wire was embedded in the muscular interventricular septum and one-third extended into the right ventricular cavity. The wire did not extend into the left ventricular cavity. However, it did bend during systole and straighten during diastole (Online Videos 3 and 4).



Figure 6. Cardiac multidetector computed tomography. Three-dimensional reconstruction of the heart with the outer wall of the right ventricle removed again demonstrated a portion of the wire extended into the right ventricular cavity. The wire did not involve the coronary arteries (Online Video 5) and therefore was suitable for percutaneous removal.



Figure 7 and 8. Abdominal computed tomography (CT) scan. Review of her previous abdominal CT scan performed several months earlier for recurrent abdominal pain revealed an inferior vena cava filter with 12 struts.



Figure 9 and 10. Abdominal computed tomography (CT) scan. Another abdominal CT scan obtained 2 months after the first abdominal CT scan shown in Figures 7 and 8 revealed that the inferior vena cava filter now has 11 struts.



Figure 11. Fluoroscopy. Fluoroscopy revealed correct positioning of the inferior vena cava filter. However, the filter was embedded in the wall of the inferior vena cava.

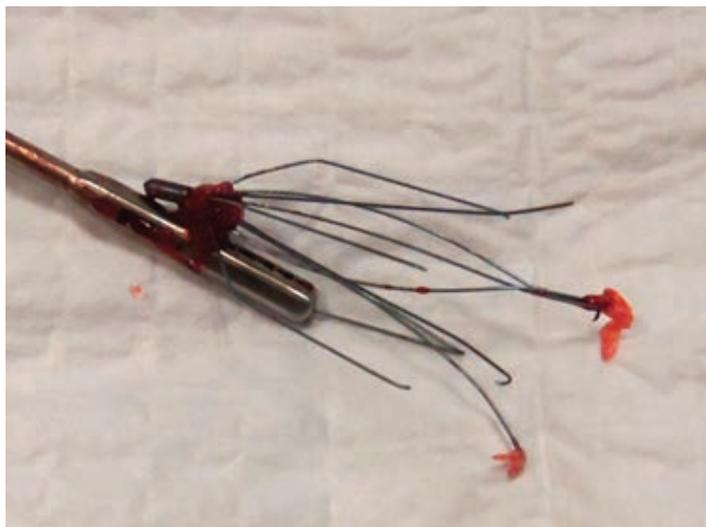


Figure 12. Fractured inferior vena cava filter (IVC). The fractured IVC filter was successfully removed percutaneously using bronchoscopic forceps.



Figure 13. Embolized strut. The embolized strut was successfully retrieved percutaneously from the interventricular septum using a snare technique guided by fluoroscopy.

References

1. Nicholson W, Nicholson WJ, Tolerico P, Taylor B, Solomon S, Schryver T, et al. Prevalence of fracture and fragment embolization of Bard retrievable vena cava filters and clinical implications including cardiac perforation and tamponade. *Arch Intern Med.* 2010 Nov 8;170(20):1827-31.