Case report

Inferior vena cava filter penetration and anchor in the vertebral column

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Learning Point for Clinicians

Although inferior vena cava (IVC) filters are relatively safe, late complications of IVC filters may include filter migration, tilting, strut fracture, penetration and IVC filter thrombosis. When penetration occurs, although uncommon, filter struts can injure any adjacent structures including the vertebral column result in anchoring in any vertebral body causing back pain.

A 32-year-old woman was admitted with a 1-day history of fever, chills and confusion. Her past medical history was remarkable for hypertension, diabetes mellitus and end-stage renal disease on hemodialysis. Five years ago, she had a pulmonary embolism, was treated initially with coumadin, which was stopped due to subdural hematoma and an IVC filter was placed at that time. On presentation, temperature was 38.8°C, heart rate 120 per min, respiratory rate 22 per min and blood pressure 80/40 mmHg. Cardiopulmonary and other systemic examination were unremarkable. She was admitted to the ICU and started on vancomycin and piperacillin/tazobactam intravenously. Blood culture yielded methicillin-resistant Staphylococcus aureus. Transesophageal echocardiogram (TEE) was done with no evidence of infective endocarditis. A few days later, fever and confusion resolved. However, she started to have lower back pain. Computed tomography (CT) scan of lumbar spine was performed and showed a single strut of the IVC filter perforating IVC and anchors in L2 vertebral body with surrounding lytic changes (Figure 1). As a result of these findings, the patient underwent IVC filter removal by vascular and neurosurgery teams. Postoperative course was uneventful and she has been well since.

Discussion

IVC filters are a relatively safe and effective treatment designed to prevent pulmonary embolism in
patients who have contraindication(s) to anticoagulation or prove intolerant of therapy. Late complications of IVC filters include filter migration, tilting, penetration, strut fracture and IVC filter thrombosis. \(^1\) Filter penetration is defined as an extension of the filter components of >3 mm outside the caval wall. \(^4\) Studies have reported strut penetration rate of 3.5–40%. \(^2,3\) Approximately, up to 10% of these perforations are symptomatic and may require intervention. \(^2,3\) Filter struts can injure any adjacent structures, including the duodenum, aorta, portal vein, small and large intestine, pancreas, kidney, renal vein, diaphragm, genitourinary system and the retroperitoneum. \(^4\) IVC filter penetration and embedding in the vertebral column are extremely rare. To our knowledge, this is one of extremely few case reports to describe an IVC filter complication as a penetration to the vertebral body and the first case to describe a resultant lytic lesion. Symptomatic IVC filter penetration is an indication for removal of the filter and repair of any injuries. If the patient undergoing filter removal is still at risk for thromboembolic phenomena, the decision to place a new filter or therapeutically anticoagulate must be made accordingly. Close follow-up of patients with IVC filters is required for reevaluation to minimize serious complications.

Conflict of interest: None declared.

References