Duodenal perforation and vertebral body erosion by a Greenfield filter

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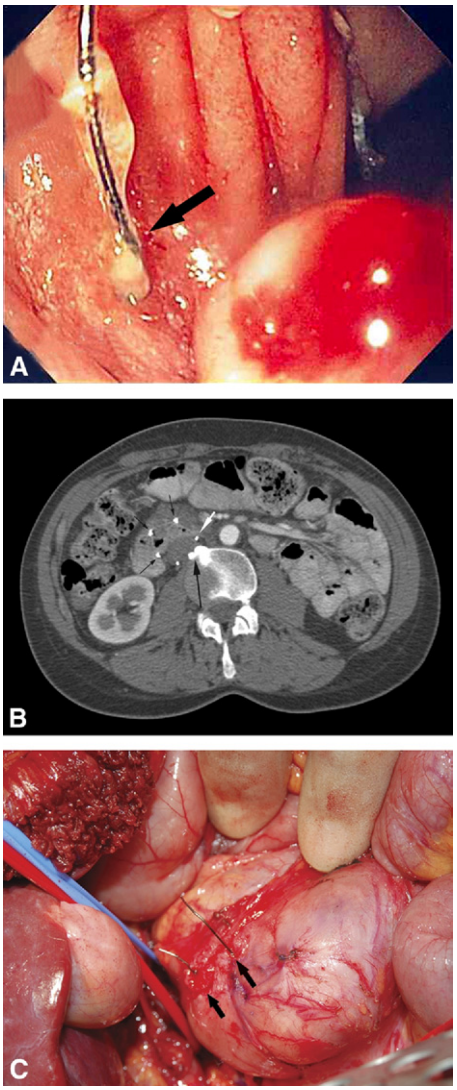

A 40-year-old woman sustained severe injuries in a subway accident in 1993. A Greenfield modified hook-titanium inferior vena cava filter (Boston Scientific, Maple Grove, Minn) was placed for pulmonary embolism prophylaxis. She presented with upper abdominal pain 15 years later. After a trial of agents for reflux failed to relieve symptoms, she underwent a more extensive workup.

An esophagogastroduodenoscopy revealed metallic foreign bodies projecting into the lumen of the duodenum (A, *arrow*). A computed tomography scan demonstrated perforation of three filter struts (B, *small arrows*) through the full thickness of the duodenal wall. An additional strut perforated through the caval wall, without invading adjacent structures (B, *white arrow*). A single fractured strut migrated and then eroded into the third lumbar vertebral body, causing an intense sclerotic reaction (B, *large arrow*; Cover).

The patient underwent abdominal exploration through an extended right subcostal incision. The duodenum was mobilized with a Kocher maneuver, and the vena cava was controlled above and below the renal veins. Cicatricial areas of inflammation were present at the sites of strut penetration (C).

Each strut was cut to separate the intraduodenal segment from the intracaval segment, and the hooks were gently rotated to ease removal from the lumen of the duodenum (C, *arrow*). The fractured strut poised in the lumbar vertebral body was localized with a clip using fluoroscopy. The surrounding sclerotic tissue was divided and the strut removed. Finally, a longitudinal cavotomy was made, and the truncated filter was extracted from the caval endothelium. The duodenum and cava were repaired primarily, and an omental flap was placed between them. The patient recovered uneventfully and is free of abdominal pain in long-term follow-up.

DISCUSSION

The ease of inferior vena cava filter placement in concert with increased attention to venous thromboembolism prophylaxis in the trauma and critical care setting have broadened the relative indications for inferior vena cava filter placement. Although few severe late complications are reported, when they occur, they often require an invasive procedure to correct.[1] Filter designs have evolved to decrease penetration and migration, and examining the structural qualities of these devices is important.[2] Complication rates may be further reduced by improving rates of retrieval and strengthening guidelines for placement.[3]

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