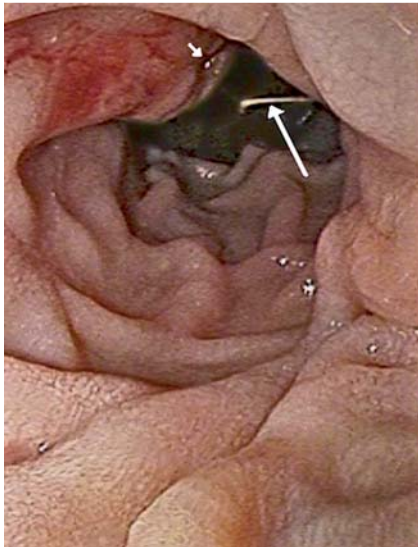


## Duodenal perforation, vertebral body perforation, and aortic abutment after placement of retrievable inferior vena caval filter

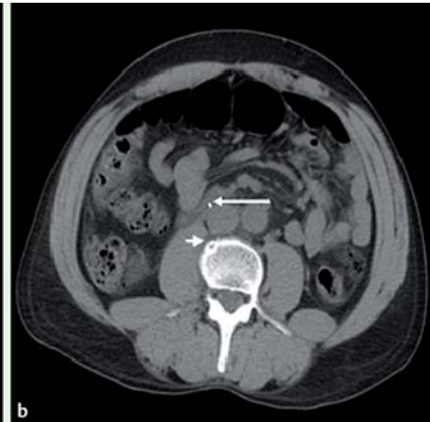


**Fig. 1** Metallic object (white arrow) penetrating through the lateral wall of the second portion of the duodenum in a 45-year-old man with a history of alcohol misuse, peptic ulcer disease, and deep venous thrombosis who presented with abdominal pain, nausea, and hematemesis; an area of bleeding is seen due to mechanical irritation (white arrow head).

The use of inferior vena caval (IVC) filters has evolved significantly since implementation in the late 1960s. Despite the very low mortality rates cited in the literature, insertion of retrievable IVC filters can be complicated in up to 10% of cases [1]. Several short- and long-term complications of retrievable IVC filter devices have been reported [2,3], including filter migration, fracture of struts, penetration of struts through the IVC and/or adjacent anatomic structures, and thrombosis [4]. Using computed tomography (CT), Durack et al. observed perforation of at least one filter component through the IVC in 43 of 50 (86%) filters [1]. Of the 43 filters demonstrating caval penetration, 18 (42%) underwent multiple CT scanning at varying time points after filter deployment, which revealed progressive erosion through the IVC wall [1]. We report a case presenting as hematemesis with initial esophagogastroduodenoscopy (EGD) revealing a metallic object penetrating the duodenum. A 45-year-old man with a history of alcohol misuse, peptic ulcer disease (PUD),



**Fig. 2 a** Computed tomography (CT), axial section, at L3 vertebral level revealing inferior vena caval filter primary struts penetrating through the IVC wall. The anterior strut (long white arrow) is seen entering the duodenal lumen, the medial strut (short white arrow) is abutting the abdominal aorta, and the posterior



**b** CT, axial section, showing the posterior strut (white arrowhead) penetrating the periosteum of the L3 vertebral body. The lateral strut (long white arrow) is penetrating the IVC and is in contact with duodenum.

and deep venous thrombosis (DVT) presented with abdominal pain, nausea, and hematemesis. Prior to admission he had been retching with coffee ground emesis. He underwent EGD, which was remarkable for ulcerative mucosa in the lateral wall of the second portion of the duodenum adjacent to a metallic foreign body protruding from the superior wall (● Fig. 1). There was an area of bleeding, arising from the ulcerative duodenal mucosa, due to mechanical trauma. The shape of the embedded object, tissue depth, and proximity to the vasculature could not be determined during the endoscopic procedure. An abdominal CT showed the IVC filter struts penetrating through the IVC lumen and entering the lateral wall of the duodenum, and then penetrating the periosteum of the L3 vertebral body, as well as abutting the abdominal aorta (● Fig. 2). The IVC filter was successfully removed via an endovascular approach, without requiring invasive open repair as reported in the vast majority of cases to date (see the recent systematic review by Malgor and Labropoulos [5]). Physicians need to maintain a broad differential diagnosis for patients presenting with hematemesis despite a history com-

prising common etiologies (i.e. PUD or Mallory–Weiss tear). Endoscopists frequently encounter foreign bodies in ambiguous locations with uncertainty about the shape of the nonvisible end. We would like to emphasize that cautious initial endoscopic evaluation and appropriate follow-up imaging prior to endoscopic attempts to remove a foreign body are invaluable to the principle of *primum non nocere*. This report also highlights the feasibility of safe and successful retrieval of a penetrating IVC filter via an endovascular approach.

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**Competing interests:** None

**H. Salameh<sup>1</sup>, R. Sharif<sup>1</sup>, S. A. Larson<sup>1,2</sup>, S. Parupudi<sup>1,2</sup>**

<sup>1</sup> Department of Internal Medicine, University of Texas Medical Branch, Galveston, Texas, United States of America

<sup>2</sup> Division of Gastroenterology and Hepatology, University of Texas Medical Branch, Galveston, Texas, United States of America

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## Corresponding author

### S. Parupudi

Division of Gastroenterology and Hepatology,  
Department of Medicine  
University of Texas Medical Branch  
301 University Boulevard  
Galveston  
TX 77555-0764  
USA  
srparupu@utmb.edu