Figure 4. An immediate image taken of the explanted filter after visual inspection confirms the filter to be intact without fractured or missing components.

inverted to reconfigure its shape and allow for complete capture into the sheath before removal from the ventricular chamber, minimizing the risk of valvular damage by avoiding "dragging" of the filter across the tricuspid valve after snaring.

In conclusion, right ventricular filter migration is a rare event that, unless managed, can result in life-threatening consequences. In this single case, endovascular retrieval of the VenaTech LP filter from the right ventricle was technically feasible with cardiothoracic surgical backup.

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Inferior Vena Cava Filter with Pancreatic Penetration and Complex Retrieval Complicated by Renal Arterial Injury

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Editor:

Inferior vena cava (IVC) filter penetration through the IVC wall and into adjacent structures is a well-documented phenomenon (1). IVC filter leg penetration into the aorta,

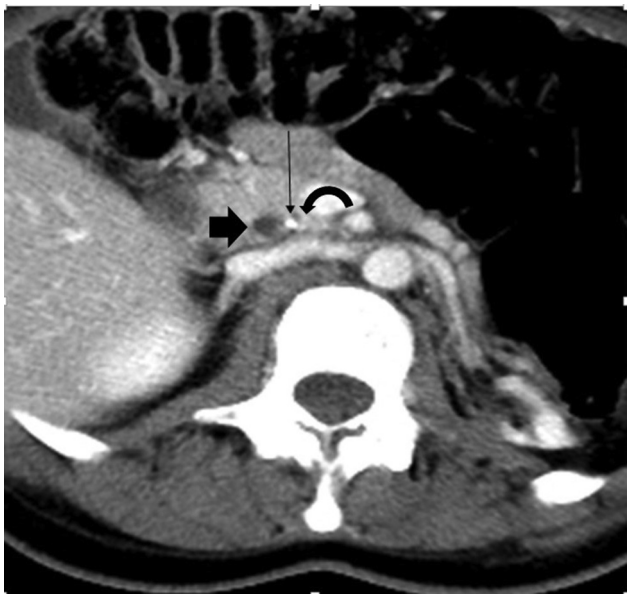

Figure 1. Preprocedural CT demonstrates the apical hook of a Günther Tulip filter (narrow arrow) embedded into the pancreatic head between the common bile duct (wide arrow) and the pancreatic duct (curved arrow).

Neither of the authors has identified a conflict of interest

Figures E1–E6 are available online at *www.jvir.org*.

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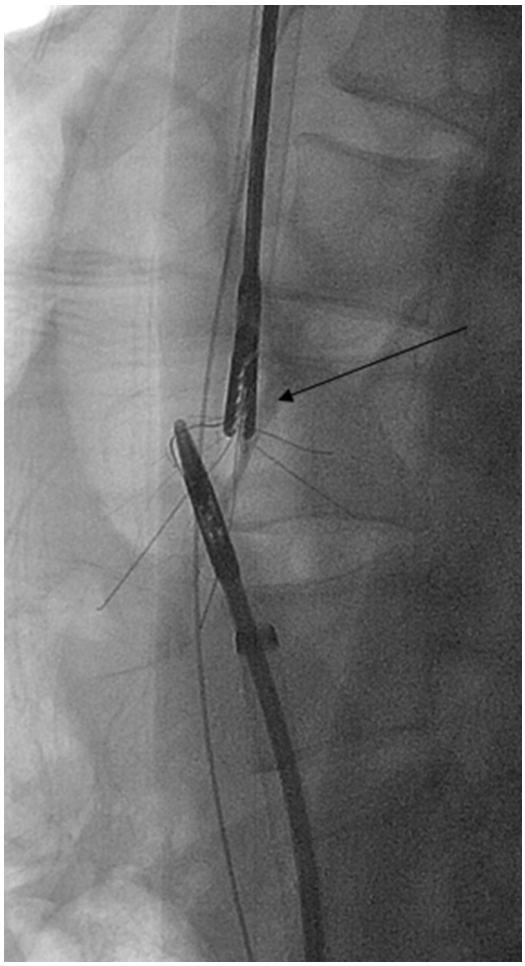

Figure 2. Lateral projection demonstrates the cranial aspect of the filter rotated and pressed caudally (arrow) while the medial leg still is stabilized from a right groin access.

small bowel, vertebral bodies, liver, and pancreas have previously been reported (1–4). However, to the authors' knowledge, apical filter hook penetration through the IVC wall to the pancreatic head and renal artery injury caused by the retrieval process have not been described. In the present letter, the authors describe the retrieval of a chronic dwelling IVC filter that required complex retrieval methods with subsequent injury to the right renal artery, as well as patient management and clinical follow-up.

This case report is compliant with the Health Insurance Portability and Accountability Act, and our institutional review board did not require approval for this retrospective case report. A 31-year-old paraplegic woman with a remote history of motor vehicle accident (requiring left nephrectomy) and thoracic spinal cord transection was referred to the interventional radiology clinic for evaluation of a Günther Tulip IVC filter (Cook, Bloomington, Indiana) placed at an outside trauma center 12 years earlier for pulmonary embolus prophylaxis. There was no history of deep vein thrombosis. Given her recent onset of vague abdominal discomfort, a fractured filter leg on a recent contrast-enhanced computed tomography (CT) scan, and the

Figure 3. Postretrieval aortic angiography demonstrates acute, high-grade stenosis (arrow) of the midportion of the right renal artery.

patient's overall concerns for long-term filter safety, IVC filter retrieval was planned. On CT evaluation, the apical hook and the conical tip of the filter showed penetration across the anterior IVC wall and into the pancreatic head (**Fig 1**). The medial leg of the filter extended into the aortic wall (**Fig E1** [available online at *www.jvir.org*]). The anterior leg of the filter was abutting/penetrating the duodenum. The posterior leg of the filter had penetrated a vertebral body with visible bone remodeling, and exhibited fracture (**Fig E2** [available online at *www.jvir.org*]). Aortic angiography before filter manipulation was performed to assess the filter leg extending toward the aortic wall and to establish arterial access in the event that aortic intervention would be needed. The vascular surgery team was on standby for the procedure in the event that urgent surgical intervention would be necessary.

Forceps (Karl Storz, Tuttlingen, Germany) were introduced into a 16-F Performer sheath (Cook) from a right internal jugular vein approach, and the cranial-most intraluminal aspect of the IVC filter was engaged. From a right common femoral vein access, a second set of forceps were used to stabilize the medial leg of the filter to avoid aortic injury (**Fig E3** [available online at *www.jvir.org*]). Based on information from the preprocedural CT scan, rotational and caudal forces were directed on the internal jugular