What s Around That Filter? : A Rare Case of Right Renal Vein Avulsion During IVC Filter Removal

Annabella Olson, DO, Houston Methodist Hospital, Houston, TX, USA
Megan McClanahan, MD, Houston Methodist Hospital, Houston, TX, USA
Eric Peden, MD, Houston Methodist Hospital, Houston, TX, USA
Maham Rahimi, MD, PhD, Houston Methodist Hospital, Houston, TX, USA

Objective:

There are various known complications of IVC filter removal, however avulsion of the right renal vein is a rare complication that to our knowledge has not yet been described.

Methods:

This is a 71-year-old female with a history of pulmonary embolism, suspected hypercoagulable disorder on Eliquis, breast cancer with Adriamycin-induced cardiomyopathy status post heart transplant, who developed bilateral lower extremity DVTs after transplant requiring placement of a Cook Celect IVC filter. Approximately four months later she presented for elective filter removal. Pre-operative abdominal x-ray demonstrated the filter was tilted anteriorly and to the patient s right. The right internal jugular vein was accessed under ultrasound guidance. An IVC filter removal kit (Cook medical) was used to attempt the standard snare and re-sheath technique. This proved unsuccessful, requiring sheath up-sizing for the loop-snare technique. After multiple attempts the filter was successfully re-sheathed and removed. There was noted to be a circular piece of vein around the proximal filter (**Figure 1**). Venogram was performed demonstrating contrast extravasation from the expected location of the right renal vein. Balloon tamponade was attempted however repeat venogram demonstrated ongoing extravasation (**Figure 2**). The patient became hypotensive, requiring conversion to general anesthesia and exploratory laparotomy. The IVC was exposed and the avulsion injury confirmed. The IVC was repaired with running 5-0 prolene, and the retracted portion of right renal vein oversewn with 5-0 prolene. The abdomen was temporarily closed, and the patient transported to the ICU.

Results:

The patient returned to the operating room the following day for repeat exploration and definitive abdominal closure. She was extubated, recovered well, and discharged home. This complication was a result of the IVC filter hook being within the orifice of the right renal vein, which avulsed with the traction applied during re-sheathing.

Conclusion:

IVC filters are often removed using the standard snare and re-sheathing technique, but may require more advanced maneuvers of which the loop-snare technique is one.[1] There are several reported complications of the various techniques including filter fracture, emoblization, and renal artery injury. Renal vein avulsion has not yet been described and may support pre-operative CT imaging for tilted IVC filters.

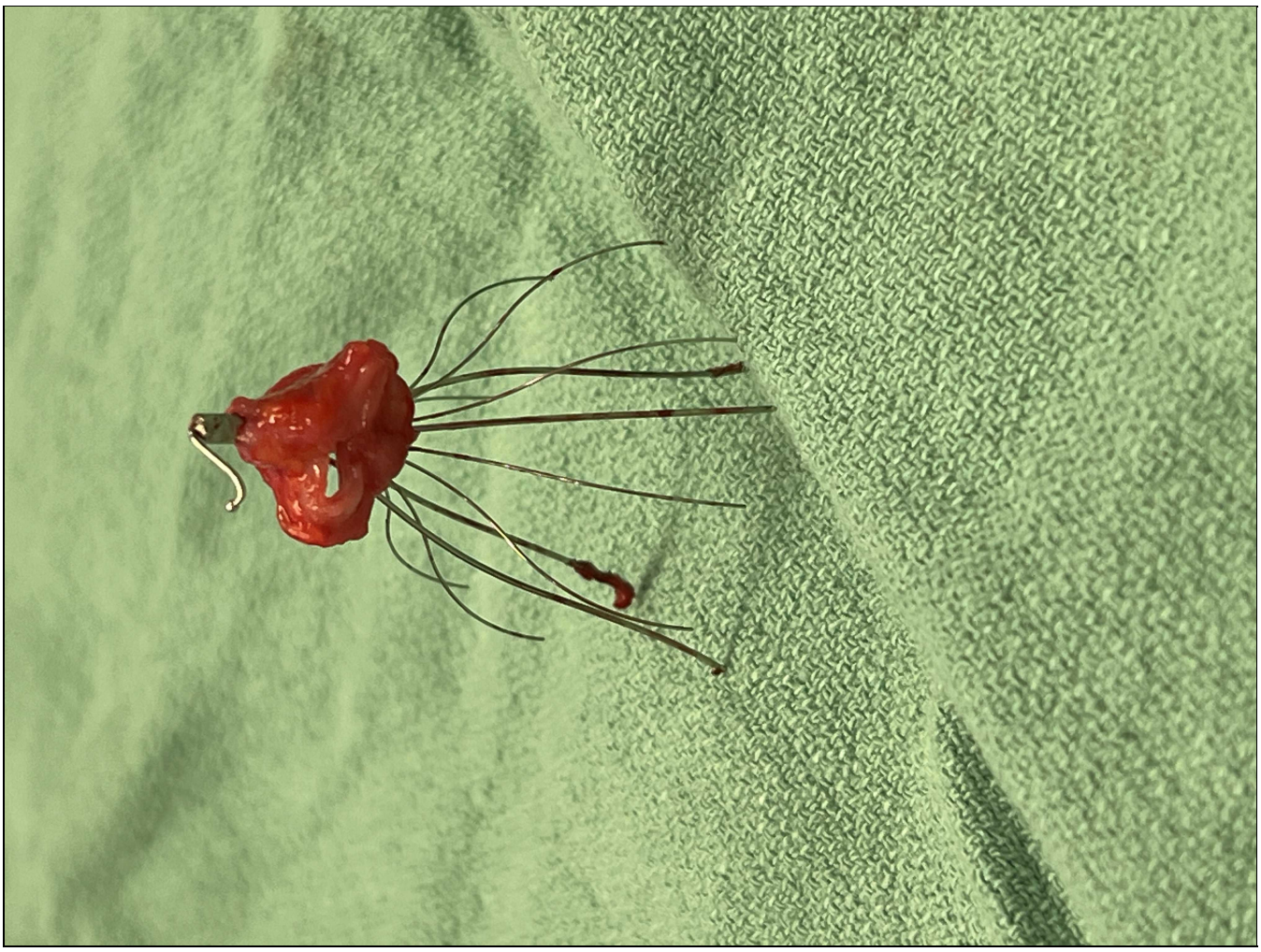

Fig 1 Cook Celect IVC filter with the orifice of the right renal vein attached.

Fig 2 Venogram demonstrating contrast extravasation from the junction of the right renal vein and IVC.