

Complex TrapEase IVC Filter Retrieval Using Combined Telescoping Sheath and Loop Snare Techniques

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Inferior vena cava (IVC) filters are an effective tool for the prevention of pulmonary embolism (PE) in a subset of patients with deep venous thrombosis (DVT). IVC filters may be designed for permanent

placement or as temporary devices that can be retrieved at a later date. The former offers the advantage of strength and stability. In rare instances, permanent IVC filters may require retrieval and/or

repositioning secondary to migration or incorrect deployment. Here we describe a rare, complex case of IVC filter retrieval and repositioning in a patient with improper filter placement.

Case Description

A 60-year-old male with a past medical history of recurrent DVT and PE presented to our hospital with atypical chest pain. Previously, while still residing in his native country of Pakistan, he had a permanent IVC filter placed due to recurrent, anticoagulant refractory DVT. On presentation, he complained of right-sided, nonradiating chest pain and stated he felt as if his IVC filter had moved. CT imaging was suspicious for device displacement. He was therefore taken to the catheterization laboratory for venogram and possible device retrieval.

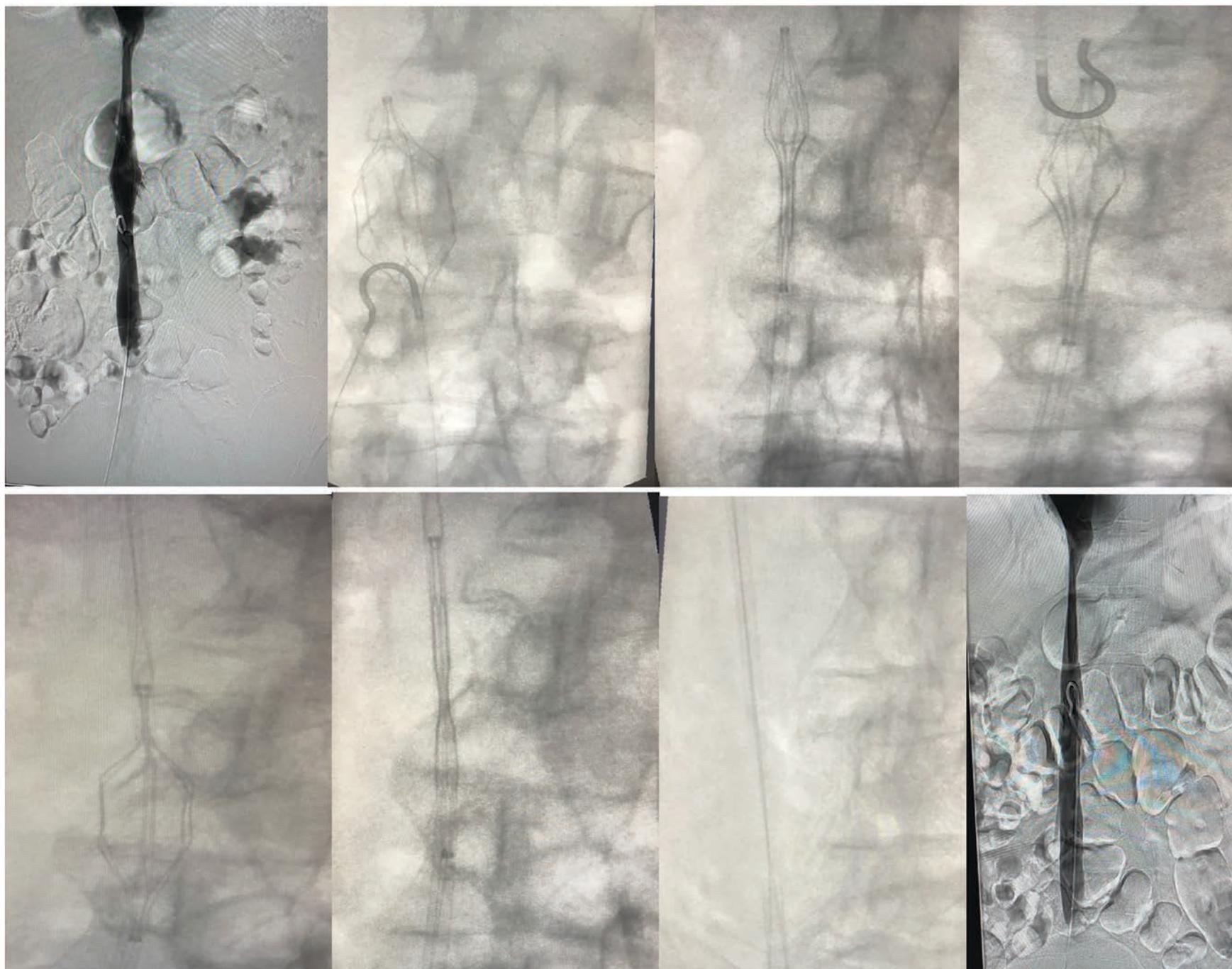


Figure 1. (Clockwise from left) Initial images show the suprarenal TrapEase IVC Filter (Cordis). We attempted to wire the inferior aspect of the filter and ensnare into our large femoral sheath. The superior attachment barbs were embedded into the IVC and prevented us from ensheathing the device. We elected to use right internal jugular access to successfully ensnare and ensheath the superior portion of the IVC filter. This filter was then telescoped into the femoral sheath and successfully removed without any extravasation of contrast.

A 12 French (Fr), 60 cm long sheath was inserted in the IVC. Selective inferior venacavogram was performed. A TrapEase IVC filter (Cordis) was noted to be in the suprarenal position. Using a 5 Fr Omni Flush curved catheter (AngioDynamics) and an .014-inch Command polymer jacketed guidewire (Abbott), we were able to wire a loop around the inferior struts of the IVC filter. The wire was then snared using a 6 mm-10 mm EN Snare endovascular snare system (Merit Medical). An attempt was made to retrieve the filter, but the sheath could not entirely encase the filter due to the superior attachment barbs. We decided to obtain internal jugular access to ensnare the superior aspect and telescope the sheath. Via micropuncture technique, access was obtained and we successfully exchanged for an 8 Fr, 55 cm Raabe sheath (Cook Medical) and advanced to close proximity to the proximal portion of the IVC filter. A 5 Fr Omni Flush catheter was passed through the superior struts and an .014-inch Command guidewire was looped. Using a 12 mm-20 mm, 120 cm EN Snare endovascular system, the wire was snared, and the superior portion of the IVC filter captured and prolapsed into the 8 Fr sheath. Simultaneously, from the 12 Fr sheath, the inferior aspect of the IVC filter was captured and prolapsed into the sheath. The 8 Fr sheath was then telescoped into the 12 Fr sheath. While maintaining tension on both looped and snared Command wires, a dilator was passed through the internal jugular sheath and the filter was successfully extracted out of the 12 Fr sheath in its entirety. A venogram was performed and demonstrated no extravasation of contrast. An Optease IVC filter (Cordis) was successfully placed in the correct infrarenal position. The patient tolerated the procedure well with no complications, remained asymptomatic, and was discharged home within 24 hours.

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Discussion

This case illustrates the use of different endovascular techniques for the removal of IVC filters. IVC filter placement has been a common procedure, with increasing prevalence due to the advent of retrievable filters and increasing indications for placement. Migration and improper placement are common indications for IVC filter retrieval and replacement. Longer embedded times and the presence of a transverse tilt, among other factors, increase the risk of retrieval failure with more conventional methods. A variety of advanced techniques have been reported in the literature when conventional methods fall short. Using a combination of two advanced techniques, the loop snare technique and the telescopic sheath technique, we were able to safely and successfully retrieve the IVC filter. The loop snare technique was designed to assist with the retrieval of tilted or embedded filters by forming a wire loop through the main body of the IVC filter. The telescopic sheath technique provides an additional safety mechanism by ensheathing the filter, thereby reducing the risk of incidental redeployment as the filter is being repositioned.

Conclusion

While conventional IVC retrieval methods have a high success rate, operators must be aware of alternative and advanced techniques when difficult cases arise. In this complicated case of device displacement, two advanced techniques, the loop snare and the telescopic sheath techniques, were used to safely and successfully retrieve and correctly reposition the device. ■

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