

Laparoscopic Retrieval of a Tilted Inferior Vena Cava Filter

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To the Editor: Retrievable inferior vena cava (IVC) filter placement has been on the rise over the years, but only a small percentage of retrievable IVC filters have been removed, ranging between 10.1% and 38.9%.^[1,2] Laparoscopic retrieval of IVC filter case report was available since 2015,^[3] the filter hook in the case report was seen clearly protruding from the anterior wall of the cava, and there was no need for vena cavotomy and reconstruction. In this case, the IVC filter tip was embedded in the posterior wall and cavotomy was required. Very few studies have reported the laparoscopic IVC filter retrieval through vena cavotomy and reconstruction.

A 32-year-old woman presented to our hospital with the history of deep venous thrombosis (DVT) in his right lower extremity. Approximately 2 years before, the patient had a retrievable IVC filter (Cook Celect, COOK MEDICAL, USA) placed in a local hospital due to the right lower leg DVT which happened during her pregnancy. Two separate attempts aimed to remove the filter were unsuccessful, abdominal computed tomography showed the filter tilted and struts of the filter penetrating the caval wall appeared to be outside the IVC [Figure 1a]. Considering the patient's young age and long-term filter-associated complications, decision was made to remove the filter by laparoscopic surgery.

The operation was performed under general anesthesia. The colon and duodenum were mobilized and retracted to the left, and then the IVC was identified. The gonadal vein and the lumbar veins were ligated with Hem-o-lok clips (Teleflex, Wayne, PA, USA). Vascular control was obtained proximal and distal to the filter. The infrarenal IVC is encircled with a tourniquet, the tourniquet passed through a half-inch piece of 20-F drain catheter and secured in place with a Hem-o-lok clip [Figure 1b]. After alerting the anesthesiologist, the two tourniquets were tightly cinched sequentially (distal and proximal); the cavotomy was performed at the apex of the IVC filter to simplify grasp of the filter tip and to collapse the filter legs. A scissor was necessary to separate the filter tip as it was discovered that the filter tip was embedded in the wall of the IVC. Using a loop snare, the filter hook was engaged and the filter was retracted into a filter-removing sheath [Figure 1c]. Cavotomy was closed using the 5-0 running prolene sutures. The tourniquets were

released to restore the caval flow. The patient recovered well from the surgery.

Although IVC filters reduce risks of pulmonary embolism, there are filter-related complications such as IVC perforation, penetration of adjacent viscera, and filter fracture.^[4,5] Several techniques for retrievals have been described previously,^[5] but some filters are still difficult to be retrieved. When endovascular removal is not possible, filters can be removed by the surgical approach, either open or laparoscopic. The open surgery is more invasive. The laparoscopic approach is suitable for patients with the filter tip well outside the IVC and protruding anteriorly.^[3] For the filter tip protruding posteriorly, or embedded in the cava wall like in this case, laparoscopic surgery would be challenging. The major risk of the laparoscopic approach is either significant blood loss or CO₂ embolism due to IVC tear. In either situation, immediate transition to an open surgery and transfusion is critical. Fortunately, surgery described in this case went well.

In conclusion, laparoscopic retrieval of IVC filters is a complex and technically demanding surgery. Careful preoperative preparation, operative experiences, and proficient skills might improve the safety and success rate of operation.

Declaration of patient consent

The authors certify that they have obtained the patient consent form. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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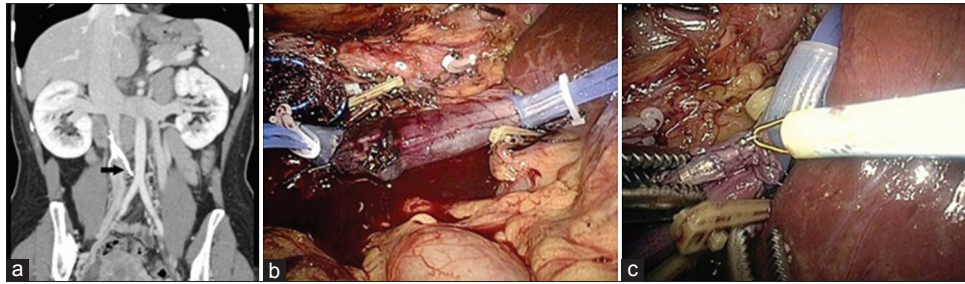


Figure 1: (a) Abdomen computed tomography showing the filter legs penetrating through the cava, abutting the abdominal aorta (arrow). (b) The vessel loops wrapped around the inferior vena cava above and below the filter. (c) Use of the wire loop and snare technique for the retrieval of the embedded filter.

REFERENCES

1. Tashbayev A, Belenky A, Litvin S, Knizhnik M, Bachar GN, Atar E, *et al.* Retrievable inferior vena cava filters: Indications, indwelling time, removal, success and complication rates. *Isr Med Assoc J* 2016;18:104-7.
2. Wassef A, Lim W, Wu C. Indications, complications and outcomes of inferior vena cava filters: A retrospective study. *Thromb Res* 2017;153:123-8. doi: 10.1016/j.thromres.
3. Benrashid E, Adkar SS, Bennett KM, Zani S, Cox MW. Total laparoscopic retrieval of inferior vena cava filter. *SAGE Open Med Case Rep* 2015;3:2050313X15597356. doi: 10.1177/2050313X15597356.
4. Grewal S, Chamarthy MR, Kalva SP. Complications of inferior vena cava filters. *Cardiovasc Diagn Ther* 2016;6:632-41. doi: 10.21037/cdt.
5. Kuyumcu G, Walker TG. Inferior vena cava filter retrievals, standard and novel techniques. *Cardiovasc Diagn Ther* 2016;6:642-50. doi: 10.21037/cdt.