

Troubleshooting OptEase inferior vena cava filter retrieval

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Abstract

For treatment of deep vein thrombosis and prevention of pulmonary thromboembolism, a retrievable inferior vena cava filter is commonly utilized as an effective bridge to anticoagulation. However, we have experienced difficulties in retrieving inferior vena cava filters. Endovascular retrieval assisted by disposable biopsy forceps is an appropriate approach because it provides a less-invasive low-cost way to remove a migrated filter. We suggest this troubleshooting technique to deal with filter hook migration into the caval wall.

Keywords

Pulmonary embolism, thromboembolism, inferior vena cava filters

Introduction

Temporary retrievable inferior vena cava (IVC) filter implantation serves as an effective bridge to anticoagulation therapy. However, several reports have described various types of retrieval failure.¹⁻⁷ In the event of IVC filter hook migration into the caval wall or strut retention, we suggest this troubleshooting technique using disposable biopsy forceps to allow easy removal of the retrievable OptEase IVC filter.

Technique

In the standard retrieval technique, a femoral vein sheath is advanced over the filter after snaring the filter hook, and the device is removed via the sheath. In the case of difficulty in removing an OptEase IVC filter (Cordis, USA) via its 10F vascular sheath (Figure 1), the EndoJaw disposable intestinal biopsy forceps (Olympus, Japan) or the Technowood disposal myocardial biopsy forceps (Technowood, Japan) can be employed to aid retrieval, both correspond to a 6F vascular sheath. When the hook is tilted, it can be readjusted to its normal position using the EndoJaw biopsy forceps. After correcting the caudal tilt of the filter hook and snaring it, the filter is removed via the 10F introducer sheath (Figures 2 and 3). In the case of retention of the side-struts, the Technowood forceps

can be used to grasp the strut of the filter body to separate it from the caval wall and dissect the tip to allow removal of the filter through the introducer sheath.

Discussion

A 71-year-old woman was admitted with a sprained left knee joint. A few days later, she complained of left leg pain and edema. Enhanced computed tomography revealed a thrombus expanding from the left external iliac vein to the femoral vein, and chest computed tomography showed a thrombus in the right main pulmonary artery. We inserted an OptEase IVC filter through the right jugular vein, and commenced acute thrombolytic therapy. The filter indwelling time was 10 days. Retrieval of the filter via right femoral access with a 10F introducer sheath was attempted using venography, but the caudal filter hook had migrated into

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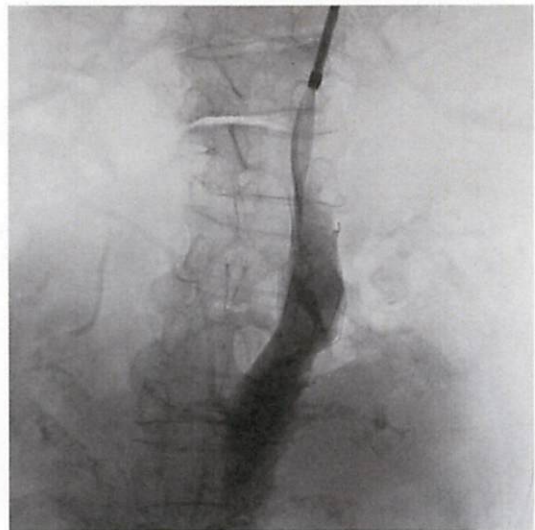


Figure 1. Venography showing a retrievable inferior vena cava filter hook invading the intima of the caval wall.



Figure 3. The temporary filter could be removed using disposable biopsy forceps. Correcting the tenting struts with biopsy forceps and snaring the filter hook was performed on a cavogram.

utilized the disposal Technowood myocardial biopsy forceps to grasp the strut of the filter body and separate it from the caval wall. It was then easily removed through the 10F sheath. No major complications resulting from this technique occurred during or after filter retrieval in these cases.

Retrievable IVC filter placement is often used in patients in the acute phase of deep vein thrombosis and pulmonary embolism. The OptEase retrievable IVC filter is a nonpermanent type of filter that can be inserted via the jugular or femoral vein. It is designed with vertical side-struts and a double basket, in a diamond shape. A centrally located hook in the basket is intended for filter snaring at retrieval. No strut fracture has been reported but a change in the basket shape can occur. Several reports have described various types of IVC filter retrieval failure.¹⁻⁷ Rimón and colleagues³ reported that in 139 cases of attempted OptEase filter retrieval, there were 11 retrieval failures: 4 due to inability to engage the filter hook, and 7 due to inability to sheath the filter because of intimal overgrowth. Various techniques to solve retrieval problems have been described for other retrievable filters, such as changing the access route to a contralateral femoral approach, balloon dilation of IVC stenosis, and detachment of the filter hook from the caval wall using the guidewire.^{4,5,7} Sugita and colleagues⁴ reported successful retrieval of a Günther Tulip IVC filter surrounded by minor clots, using a looped wire technique.⁴ Van Ha and colleagues⁵ suggested various retrieval methods for the same filter, including catheter twisting, a modified snare, loop snare, and a balloon

Figure 2. Fluoroscopy showing inferior vena cava filter hook intimal migration at the level of L1. We had difficulty in snaring the caudal filter hook which had become embedded in the caval wall.



the intima of the caval wall. The filter was successfully removed using the Endostaw forceps. An 84-year-old woman with a right femoral fracture required orthopedic bed rest. Computed tomography revealed a thrombus expanding from the right external iliac vein to the femoral vein. To prevent pulmonary embolism, we immediately instituted thrombolytic and anticoagulation therapy, and inserted an IVC filter. The filter dwelling time was 8 days. At retrieval, a slight inclination of the filter was observed in venography. We

technique.⁵ Onat and colleagues⁶ reported 9 failures among 124 OptEase filter retrieval attempts, due to inability to engage the filter hook. Successful retrieval from vessels narrower than the IVC, using endobronchial forceps, was reported in 10 cases of fractured filters.⁷

After effective thrombolytic and anticoagulation therapy in the usual manner, IVC filter retrieval within 12 days is recommended in Japan, to reduce the retrieval complications of prolonged filter implantation. Occasionally, we have had difficulty in engaging a filter that had migrated slightly in the caudal direction, or a hook that could not be snared by the standard retrieval kit. Inclination of the filter and intimal migration of the filter hook into the caval wall is often observed in venography, but owing to the shape of the basket, the OptEase filter usually has no strut fracture. In attempts to retrieve the OptEase filter, we have used myocardial and intestine biopsy forceps, but not endobronchial biopsy forceps. We suggest this retrieval troubleshooting technique so that anyone can easily remove temporary IVC filters with intestinal or myocardial biopsy forceps if the filter hook has migrated into the caval wall.

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Conflict of interest statement

None declared.

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