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. 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 Technwood disposable myocardial biopsy forceps (Technwood, 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 Technwood 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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twisting a modulated sense, a roof scene, a balloon.

We witnessed symptoms of fatigue, including calmer.

Temperature was taken, and the patient was placed in a recovery room. The patient was then inserted into the IVC catheter and advanced into the aorta.

A transesophageal echo confirmed that the catheter was correctly placed. The patient was then placed on a bed and monitored for the next 24 hours.

Figure 1: Transesophageal echo showing a catheter in the IVC.

Figure 2: Fluoroscopic image showing a catheter in the IVC.

The catheter was removed after 24 hours, and the patient was discharged the following day.

Figure 3: The patient was discharged after 24 hours.
technique. Onat and colleagues 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 forces, was reported in 10 cases of fractured filters.

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.

Acknowledgements

The authors would like to thank Yasushi Takenouchi and Takashi Nakayama for their valuable support.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of interest statement

None declared.

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