Inferior vena cava filter

Information for patients

Introduction

- A vena cava filter is a small, metal device about an inch long, shaped rather like the spokes of an umbrella, or a cage, that is designed for percutaneous caval interruption. The filter is placed in the inferior vena cava (the large vein in the abdomen) which brings blood back from the legs and pelvis, towards the heart. If there are blood clots in the veins in the legs or pelvis, these could pass up the vena cava and into the lungs, causing potentially fatal pulmonary embolism (PE). The filter will trap these blood clots and prevent them entering the lungs.
- IVC filters may be permanent which are mainly catered for elderly patients, in patients with short life expectancy or in patients who cannot receive anticoagulant (blooding thinning agent to prevent clot formation). Retrievable IVC filters are filters that can be removed later if the filters are no longer needed. These may also be left behind permanently if the indications for IVC filters persist.
- The procedure will be performed by a radiologist with special training in interventional radiology in the Department of Radiology under image guidance.

Procedure

- Usually performed as an in-patient basis, under local anaesthesia and aseptic technique.
- The vital signs including your blood pressure, pulse and oxygenation status will be monitored throughout the entire procedure.
- Generally, the vein in the groin or neck is punctured. The vein in the arm may also be used.
- The skin and deeper tissues over the vein will be anaesthetized with local anesthetic, and then a needle will be inserted into the vein. Once the radiologist is satisfied that this is correctly positioned, a guidewire is placed through the needle, and into the vein. Then the needle is withdrawn and a fine plastic tube, called a sheath, is placed over the guide wire and into the vein.
- The vascular anatomy of the vena cava is mapped by performing venogram prior to filter selection and placement.
- The radiologist uses the x-ray equipment to make sure that the sheath and the guidewire are moved into the right position, and then the guidewire is withdrawn. The filter is released from the sheath, and deployed in the vena cava. The filter is usually placed below the level of renal veins. In patients with high clot in the IVC, the filter may be placed above the level of renal veins.
- Generally, the procedure will be about ½ to 1 hour, depending on complexity.
- Once back to your ward, your vital signs and puncture site will be monitored. Bed rest for about 6 hours and keeping the punctured leg straight, or propped up 30 degrees for neck puncture, are recommended.
- If removal or reposition of a retrievable IVC filter is considered, it will be removed or repositioned later. A vein in the neck or the groin will be punctured. A bigger vascular sheath is inserted and the filter is removed or repositioned with a snare made of metallic wire. There is a time frame within which the retrievable filter should be retrieved or repositioned.

Potential complications

- Inferior vena caval occlusion (less than 10%).
- Recurrent pulmonary embolism (less than 5%).
- Access site thrombosis (less than 6%).
- Filter embolization (rare). The filter may migrate to the right heart and has to be removed. Open heart surgery for filter removal is required if percutaneous retrieval fails.
- Delayed venous insufficiency (less than 10%): varicose veins, leg pigmentation swelling or ulcer due to venous disease. This may be related to the disease process.
- Unsuccessful removal of retrievable IVC filter: usually depends on duration of filter placement and if there is any tilting of the filter.
- Some patients have congenital venous abnormality, which escapes detection during filter deployment. Blood clot may pass through these abnormal veins to the pulmonary arteries despite an IVC filter in the normal IVC (rare).

Rare complications:

- Filter migration after deployment.
- Filter struts penetration through IVC wall, causing injury to aorta, ureters or duodenum.
- Filter fracture.
- Guidewire entrapment (less than 1%), which may occur late when a guidewire is used for other procedure like central venous catheter placement.
- Death (less than 1%).
- The overall adverse reactions related to iodine-base non-ionic contrast medium is below 0.7%. The mortality due to reaction to non-ionic contrast medium is below 1 in 250000.

Disclaimer

This leaflet has been prepared by the Hong Kong Society of Interventional Radiology.

This leaflet is intended as general information only. Nothing in this leaflet should be construed as the giving of advice or the making of a recommendation and it should not be relied on as the basis for any decision or action. It is not definitive and the Hong Kong Society of Interventional Radiology Limited does not accept any legal liability arising from its use. We aim to make the information as up-to-date and accurate as possible, but please be warned that it is always subject to change as medical science is ever-changing with new research and technology emerging. Please therefore always check specific advice on the procedure or any concern you may have with your doctor.

Prepared in 2010. Version 2.0.