**VENA CAVA FILTER**

**OBJECTIVE:**

To describe the indication for a vena cava filter (VCF), the most common and important associated complications, and the practical management of patients who have a VCF placed.

**BACKGROUND:**

Appropriately placed VCFs are designed to reduce the frequency of significant pulmonary embolism (PE) by trapping thromboemboli arising in the deep veins of the lower extremities before they reach the lungs.

**INDICATION FOR VCF INSERTION:**

*Use of a VCF should be considered judiciously given the lack of high-quality evidence that they prevent clinically important PE.*

VCFs are indicated in patients with a recently diagnosed (usually within 4 weeks) acute proximal DVT or acute PE in whom there is a contraindication to anticoagulation. If acute proximal DVT is not present, then a decision on the need for VCF should be taken on a case-by-case basis in consultation with a physician with thrombosis medicine expertise.

VCF placement can also be considered in select hemodynamically unstable patients with acute DVT (in shock or ventilatory support) in addition to other advanced therapies (thrombolysis, thrombectomy, embolectomy) particularly where there is a concern that endovenous intervention may lead to iatrogenic PE.

**WE DO NOT SUPPORT PLACING A VCF IN THE FOLLOWING SITUATIONS:**

- Patients with DVT and/or PE who are therapeutically anticoagulated
- Patients with large PE who have limited cardiopulmonary reserve who are therapeutically anticoagulated
- Recurrent DVT or PE despite usual therapeutic anticoagulation
- As primary thromboprophylaxis in patients at high risk for VTE such as major trauma, major surgical procedures
- In chronic thromboembolic pulmonary hypertension (CTEPH)
- In patients undergoing extended anticoagulation for VTE and have completed the acute phase of treatment in whom a contraindication to anticoagulation develops
- In those with isolated subsegmental PE with a contraindication to anticoagulation (provided acute proximal DVT has been ruled out)

**VCF OPTIONS:**

There are 2 types of VCF:
1. **Permanent** (non-removable) filters

2. **Retrievable** filters, which are designed to be removable when they are no longer necessary, or which can be left in place if they cannot be removed

We recommend the use of retrievable filters. Unless there are extenuating circumstances, patients who receive a retrievable VCF should have the filter removed once appropriate anticoagulation is started. Although VCF placement is generally considered safe, they can be associated with several perioperative and delayed complications.

**COMPPLICATIONS OF VCF:**

1) **Immediate complications during VCF placement:**
   - insertion site hematoma/bleeding
   - filter misplacement
   - acute filter embolization
   - allergic reactions to contrast

2) **Post-procedural and short-term complications of VCF:**
   - access site thrombosis
   - infection at the insertion site
   - AV fistula formation

3) **Long-term complications of VCF:**
   - filter tilt
   - filter migration
   - filter fracture and embolization of filter components
   - penetration of filter struts outside the IVC and into adjacent structures
   - IVC thrombosis and/or stenosis
   - failure to retrieve the VCF

4) **Complications associated with retrieval attempts:**
   - injury to caval wall
   - filter fracture and embolization
   - inability to retrieve

**POST-VCF INSERTION MANAGEMENT:**

1) Anticoagulation should be initiated to prevent extension of the DVT as soon as it is safe to do so.

2) Virtually all VCFs should be removed shortly after the patient is able to tolerate appropriate anticoagulation. The longer a filter is left in situ, the lower the success of retrieval and the higher the risk of long-term complications.

3) Retrieval may be most successful if attempted within 9-12 weeks post insertion. More recent filters can be retrieved six or more months after placement.
4) A documented plan for retrieval of the VCF should be made at the time of filter insertion. If a VCF is not removed, the patient requires regular, long-term monitoring of clinical status and filter integrity, in addition to possibly long-term anticoagulation (see below).

5) Maintenance of patients on therapeutic anticoagulation should be considered at the time of retrieval and at experienced centers this has not been associated with increased risk of retrieval complications.

SPECIAL CONSIDERATIONS:

- Very limited evidence supports the use of VCFs and there is no evidence that filters prevent fatal PE. They are also associated with an increased risk of DVT.
- The duration of anticoagulation is generally not affected by the presence of a VCF. Patients require anticoagulation for the appropriate duration for the DVT and not just because they have a filter in place. However, this area is controversial and there is no consensus – some clinicians continue anticoagulation long-term in patients with a VCF while others stop anticoagulants once the patients have completed the appropriate duration of anticoagulation for the DVT.
- There are few studies of VCFs in children.
- On July 25, 2016, Health Canada released a letter advising physicians to “carefully consider the indications for IVC filters. Health Canada considers the following indications appropriate given available clinical data:
  - Patients with acute proximal deep vein thrombosis (DVT) of the leg and a contraindication to anticoagulation
  - Patients with acute pulmonary embolism (PE) and a contraindication to anticoagulation

Retrievable IVC filters are intended for short-term placement and, when possible, should be removed when anticoagulation therapy can be started or if a patient’s risk of PE subsides. Health Canada encourages each hospital to identify all patients who have a retrievable IVC filter placed and to develop a formal strategy to assess these patients for filter removal.”

Health Canada also recommended “If the individual risk/benefit assessment indicates that a retrievable IVC filter should be removed, the patient should be referred for IVC filter removal when feasible.”

OTHER RELEVANT THROMBOSIS CANADA CLINICAL GUIDES:

- Deep Vein Thrombosis (DVT): Treatment
- Pulmonary Embolism (PE): Treatment

REFERENCES:


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*Please note that the information contained herein is not to be interpreted as an alternative to medical advice from your doctor or other professional healthcare provider. If you have any specific questions about any medical matter, you should consult your doctor or other professional healthcare providers, and as such you should never delay seeking medical advice, disregard medical advice or discontinue medical treatment because of the information contained herein.*