VENA CAVA FILTER

Thrombosis Canada
Thrombose Canada

OBJECTIVE:

To describe the indication for a vena cava filter (VCF), the most common and important 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 emboli arising in the deep veins before they reach the lungs. They do not prevent deep vein thrombosis (DVT).

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 recent (within past 4 weeks) proximal DVT in whom therapeutic anticoagulation is not possible because of high bleeding risk.

We do not support placing a VCF for the following reasons:

- Patients with PE who have a contraindication to anticoagulation unless there is a concomitant proximal DVT;
- Patients with major PE who have limited cardio-pulmonary reserve who are 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; or
- In thromboembolic pulmonary hypertension.

VCF OPTIONS:

There are 2 types of VCF:

1. **Permanent** (non-removable) filters
2. **Retrievable** (optional) 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 only recommend the use of retrievable filters. Unless there are extenuating circumstances, patients who receive a VCF should have the filter removed once appropriate anticoagulation is started.

COMPLICATIONS OF VCF:

1) **Immediate complications during VCF placement:**
   - insertion site hematoma or thrombosis
   - filter misplacement
   - acute filter embolization
   - allergic reactions to contrast
2) **Post-procedural and short-term complications of VCF:**
   - Infection at the insertion site
   - AV fistula formation
   - Pneumothorax
   - Air embolism
3) **Long-term complication of VCF:**
   - filter migration
   - filter fracture and embolization of filter components
   - penetration of filter struts outside the IVC and into adjacent structures
   - inappropriate delay in provision of anticoagulation in patients with acute VTE
   - failure to retrieve the VCF leading to chronic thrombosis and recurrent thromboembolism

POST-VCF INSERTION MANAGEMENT:

1) Anticoagulation should be initiated to prevent extension of the DVT as soon as it is safe to do so (once the contraindication to anticoagulation has resolved).
2) Virtually all VCFs should be removed shortly after the patient has been appropriately anticoagulated. 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.
4) A documented plan for retrieval of the VCF should be made at the time of filter insertion.
5) 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 under Special Considerations.

SPECIAL CONSIDERATIONS:

- Very limited evidence supports the use of VCFs and there is no evidence that filters prevent fatal PE.
- 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*.
- There are few studies of VCFs in children.

**This area is controversial and although there is no consensus, if the VCF is not removed it may increase the risk of thrombosis so the risk to benefit ratio of long-term anticoagulation for each patient needs to be considered.*

OTHER RELEVANT THROMBOSIS CANADA CLINICAL GUIDES:

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

REFERENCES:

Rajasekhar A. Inferior vena cava filters: current best practices. J Thromb Thrombolysis 2015;39:315-327

Angel LF, et al. Systematic review of the use of retrievable inferior vena cava filters. J Vasc Interv Radiol 2011;22(11):1522-130.

Decousus H, Leizorovicz A, Parent F, et al. Prévention du Risque d'Embolie Pulmonaire par Interruption Cave Study Group. A clinical trial of vena caval filters in the prevention of pulmonary embolism in patients with proximal deep-vein thrombosis. N Engl J Med. 1998;338(7): 409-415.

Ingber S, Geerts WH. Vena caval filters: current knowledge, uncertainties and practical approaches. Curr Opin Hematol 2009;16(5):402-6.

Mismetti P, Laporte S, Pellerin O, et al. Effect of a retrievable inferior vena cava filter plus anticoagulation vs anticoagulation alone on risk of recurrent pulmonary embolism: a randomized clinical trial. JAMA. 2015;313:1627-1635.

Muriel A, Jimenez D, Aujesky D, et al. Survival Effects of Inferior Vena Cava Filter in Patients With Acute Symptomatic Venous Thromboembolism and a Significant Bleeding Risk. J Am Coll Cardiol 2014;63:1675-83.

PREPIC Study Group. Eight-year follow-up of patients with permanent vena cava filters in the prevention of pulmonary embolism: the PREPIC (Prevention du Risque d'Embolie Pulmonaire par Interruption Cave) randomized study. Circulation. 2005;112(3):416-422.

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