

PREVENTION AND TREATMENT OF VENOUS THROMBOEMBOLISM

International Consensus Statement 2013 Guidelines According to Scientific Evidence

Developed under the auspices of the:

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European Venous Forum

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Union Internationale du Phlebologie

Inferior Vena Cava Filters

Chapter 16

Indications for Inferior Vena Cava Filters

- **Indications for inferior vena cava (IVC) filters are categorized**
 - ▶ Absolute
 - ▶ Relative
 - ▶ Prophylactic
- **In the truest sense, all IVC filters are “prophylactic”**
 - ▶ Describes the use of an IVC filter in patients at risk but without an identifiable PE or DVT

Indications for Inferior Vena Cava Filters

Absolute Indications

- **Absolute indications include**
 - ▶ Venous thromboembolic complications associated with a contraindication to anticoagulation
 - ▶ Documented failure of anticoagulation
 - ▶ Complications of anticoagulation in patients with VTE
- **Evidence suggests most patients treated with IVC filters do not have any of the 3 accepted absolute indications¹**

Indications for Inferior Vena Cava Filters

Relative Indications

- **A relative indication exists when a patient has a VTE complication and the risk of PE is high**
 - ▶ Bleeding complications are high with anticoagulation
- **Relative indications include**
 - ▶ Large free-floating thrombus in the vena cava
 - ▶ Massive PE
 - ▶ Recurrent PE in the presence of a filter
 - ▶ DVT in patients with limited cardiopulmonary reserve
 - ▶ Those suspected to be noncompliant with anticoagulation

Indications for Inferior Vena Cava Filters

Prophylactic Indications

- **Prophylactic indications occur in patients who have neither DVT nor PE but the risk of a VTE complication is high and the efficacy of alternative forms of prophylaxis is considered poor or associated with high bleeding risk**

Evidence for IVC Filters

IVC Filters Versus No Filtration

- **A RCT evaluated the benefit of filters in patients with acute DVT undergoing routine anticoagulation¹**
 - ▶ Primary endpoint was PE at 12 days
 - ▶ Patients randomized to IVC filters had significantly fewer PE versus those without a filter (1.1% versus 4.8%)
 - ▶ Patients with IVC filters had an increased incidence of recurrent DVT at 2 years (20.8% versus 11.6%)
- **Eight-year follow-up data demonstrated**
 - ▶ Recurrent PE rate was 6.2% in patients with IVC filters versus 15.1% in controls
 - ▶ Recurrent DVT was higher patients with IVC filters (35.7% vs 27.5%) than controls
- **Mortality was equivalent**

Thrombotic Risk by IVC Filters

- **Observed that thrombotic risk and retrievability varies between filters¹**
- **Filters producing regions of flow stagnation and recirculation at the wall of the vena cava. May produce turbulence and thus pose an increased risk of thrombosis^{2,3}**
 - ▶ Hemodynamic observations have translated into clinically relevant findings as observed in a randomized trial⁴

1. Karmy-Jones R, et al. J Trauma 2007; 62(1):17-24; discussion 24-5.
2. Harlal A, et al. J Vasc Interv Radiol 2007; 18(1 Pt 1):103-15.
3. Couch GG, et al. J Vasc Surg 2000; 31(3):539-49.
4. Usuh F, et al. J Vasc Surg 2010; 52(2):394-9.

Cochrane Review of IVC Filters

- **A Cochrane review of the use IVC filters for prevention of PE determined a lack of information on the effectiveness¹**
- **Strong recommendations cannot be provided for IVC filters on the basis of established and current evidence**

Optional or Retrievable IVC Filters

- **Increasing numbers of optional (retrievable) IVC filters are being used**
- **A systematic literature review of retrievable IVC filters comprising of 37 studies and 6834 patients found a mean retrieval rate of 34%⁸**
- **Complication rates included**
 - ▶ DVT (5.4%)
 - ▶ Filter migration (1.3%)
 - ▶ Vena cava thrombosis/stenosis (2.8%)
- **IVC filter fractures accounted for 22% of complications**

Insertion of IVC Filter

- **Problems associated with IVC filter insertion may be categorized as early or late complications¹**
 - ▶ Early complications, including incomplete or asymmetric deployment, malpositioning or tilting, had a reported incidence of 1% to 12.4%
 - ▶ Late complications, including filter migration, filter disruption, caval thrombosis, caval perforation and recurrent pulmonary embolism, were reported in 1.7% to 33%
- **Some complications vary by filter type¹**
 - ▶ Filter migration and tilting more common with Bard filters
 - ▶ IVC thrombosis was commonly seen with TrapEase (Cordis) filters in patients with malignancy or other hypercoagulable states
 - ▶ The incidence of other complications appeared to be similar among various IVC filters

Recommendations

Inferior Vena Cava Filters

- **Patients with PE or proximal DVT with contraindications to anticoagulation should receive an IVC filter**
 - ▶ Level of evidence: Moderate
- **Patients who have recurrent acute PE despite therapeutic anticoagulation should receive an IVC filter**
 - ▶ Level of evidence: Low
- **Patients with acute PE and poor cardiopulmonary reserve should be considered for an IVC filter**
 - ▶ Level of evidence: Low

Recommendations

Inferior Vena Cava Filters

- **Patients who receive a retrievable IVC filter should be evaluated for filter removal within the specific filter's retrieval window**
 - ▶ Level of evidence: Low
- **An IVC filter should not be used routinely as an adjunct to anticoagulation**
 - ▶ Level of evidence: Low
- **Patients receiving an IVC filter due to a contraindication to anticoagulation should be restarted on anticoagulation whenever the contraindication no longer exists**
 - ▶ Level of evidence: Low