

# PREVENTION AND TREATMENT OF VENOUS THROMBOEMBOLISM

## International Consensus Statement 2013 Guidelines According to Scientific Evidence

*Developed under the auspices of the:*

Cardiovascular Disease Educational and Research Trust (UK)

European Venous Forum

North American Thrombosis Forum

International Union of Angiology and

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 indications<sup>1</sup>**

# 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 anticoagulation<sup>1</sup>**
  - ▶ 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 filters<sup>1</sup>**
- **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<sup>2,3</sup>**
  - ▶ Hemodynamic observations have translated into clinically relevant findings as observed in a randomized trial<sup>4</sup>

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 effectiveness<sup>1</sup>**
- **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%<sup>8</sup>**
- **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 complications<sup>1</sup>**
  - ▶ 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 type<sup>1</sup>**
  - ▶ 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