Q/Do endovascular filters prevent PE as effectively as anticoagulants in patients with DVT?

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EVIDENCE-BASED ANSWER

A/**It's unclear,** given that no studies directly compare the efficacy of endovascular filters with other types of prophylaxis to prevent pulmonary embolism (PE) in adults with deep venous thrombosis (DVT).

Although inferior vena cava filters (IVCFs) reduced the incidence of PE in a randomized controlled trial (RCT), patients treated with IVCFs and anticoagulation with unfractionated heparin or low-molecular-weight heparin had a greater risk of developing recurrent DVT than patients treated with anticoagulation alone (SOR: **B,** 1 RCT).

Patients should be considered for IVCF placement in the following circumstances (SOR: **C,** consensus guideline):

- anticoagulation is contraindicated
- a serious complication has resulted from anticoagulation treatment
- thromboembolism recurs despite adequate anticoagulation.

Consider placing a filter when anticoagulation is contraindicated, causes a complication, or fails to prevent recurrent thromboembolism.

Evidence summary

One RCT examined PE rates in 400 patients with acute proximal DVT who were randomized to receive or not receive a permanent IVCF and also randomized to receive either unfractionated heparin or low-molecular-weight heparin for at least the first 3 months.[1,2] Patients with a contraindication to anticoagulation or history of anticoagulation failure were excluded.

After 8 years of follow-up, symptomatic PE occurred less often in the filter group than the nonfilter group (6.2% vs 15.1%; *P*=.008; hazard ratio [HR]=0.36, 95% confidence interval [CI], 0.17-0.77; number needed to treat [NNT]=11.2). The filter group had a higher incidence of recurrent DVT than the nonfilter group (35.7% vs 27.5%; HR=1.52, 95% CI, 1.02-2.27; number needed to harm=12.2).[1,2]

The study lacked statistical power to draw any conclusion about the efficacy of IVCFs in preventing PE over shorter time periods or in reducing PE-related or overall mortality.[3] Further research, including RCTs, needs to be done to determine how the efficacy of endovascular filters compares with standard PE prophylaxis.

How often does PE occur in patients with filters?

Patients with DVT generally have associated PE 10% of the time.[4] Several cohort studies have examined the prevalence of recurrent PE in patients with IVCFs, but none compared prevalence in patients with and without filters.

A prospective cohort study followed 481 patients who received an IVCF because of either a contraindication to anticoagulation or sustained recurrent embolization despite adequate anticoagulation. Of the patients who had a filter for 6 months or longer, 2% had clinically suspected PE, but PE was confirmed in only 0.5%.[5]

Another multicenter, prospective cohort study (N=222) found radiographically confirmed PE after filter placement in only 2% of patients with IVCFs after a mean follow-up of 15 months.[6]

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A retrospective cohort study (N=318) concluded that 3.1% of the patients with IVCFs had a recurrent PE, diagnosed radiographically.[7]

A single-center retrospective cohort study of 1731 patients with IVCFs placed for various indications showed PE in 5.6% of patients. Some embolisms were clinically suspected and not confirmed.[8]

Complications of filter placement

Complications from IVCF placement generally occur less than 3% of the time. The most common complication is postthrombotic syndrome (70%). Risks associated with IVCF placement include DVT, postthrombotic syndrome, maldeployed filter, caval thrombosis, retroperitoneal hemorrhage, malposition, filter migration, arrhythmia, insertion site complications (such as infection or hematoma), PE, myocardial infarction, and death.[1,2,5-12]

Recommendations

The American College of Chest Physicians recommends considering an IVCF for patients with DVT who have a contraindication to anticoagulation, complication of anticoagulation, or recurrent thromboembolism despite adequate anticoagulation.[12] JFP

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