Editorial

Vena Cava Filters
Do We Know All That We Need to Know?

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Considerable progress has been made in the last decade in understanding the natural history of “treated” venous thromboembolism (VTE). VTE occurs at a rate of 1/1000 in the general population and significantly increases with age, especially after age 60, with rates as high as 1/100. Duplex ultrasonography has largely replaced venography as the diagnostic test of choice for deep venous thrombosis (DVT), and spiral CT pulmonary angiography is rapidly replacing ventilation/perfusion lung scans as the diagnostic test of choice for pulmonary embolism (PE).

Multiple agents are now available for the initial treatment of VTE including unfractionated heparin, low-molecular-weight heparin, and fondaparinux, and although the vitamin K antagonists remain the sole oral agents for the long-term treatment of VTE, new oral alternatives are on the horizon. As the result of large randomized controlled trials the secondary prevention of recurrent VTE has improved, with the duration of therapy now based on an understanding of the initial inciting event and the presence of ongoing risk factors.

Patients with idiopathic DVT or persistent risk factors require anticoagulant therapy for a minimum of 6 months, and more likely, ≥12 months, with a cumulative risk of recurrence as high as 30% at 8 years. For patients with cancer and VTE, it has been shown that therapy with low-molecular-weight heparin for the first 3 to 6 months results in better outcomes than the outcomes of patients transitioned to warfarin early in the course of therapy. Unfortunately, the application of vena cava interruption has not undergone the same robust scrutiny as have other therapeutic interventions, and consequently our knowledge of when and how to use inferior vena cava (IVC) interruption is limited. That is, until now.

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The idea that interrupting flow in the IVC is a reasonable and tolerable means of preventing PE began 50 years ago, first with ligation or plication techniques, which then moved into less invasive techniques by percutaneous insertion of filtering devices. The use of these devices has increased dramatically during the last 2 decades, with estimates of 2000 being inserted in 1979, which increased to 49,000 in 1999. Decousus et al, in their long-term study in this issue of Circulation of the comparative outcomes of patients with DVT with or without PE who were treated initially with or without a vena cava filter, have done a great service. They have not only performed the first and only randomized controlled trial of such therapy but also by studying patients for up to 8 years, they have defined the long-term outcome of these patients. Their initial report in 1998 randomized 400 patients to receive either 1 of 4 types of IVC filters with concomitant anticoagulation or anticoagulation alone. At the 2-year follow-up, patients with filters had fewer PE but more DVTs compared with those with anticoagulation alone. Now, at 8 years, even though the total number of VTE events was similar in both groups (36.4% versus 35.4%, filter versus no filter, respectively), those with an IVC filter experienced a greater cumulative incidence of symptomatic DVT (35.7% versus 27.5%; HR 1.30; CI 1.02 to 2.27; P=0.04), but significantly fewer symptomatic pulmonary emboli (6.2% versus 15.1%; HR 0.4; CI 0.17 to 0.79; P=0.008). Of particular note is the finding that the rate of postthrombotic syndrome (70.3% versus 69.7%, HR 0.87; CI 0.66 to 1.13; P=0.30), a complication that may be expected with greater frequency in patients with an IVC filter, was not different between groups. The conclusion from this long-term follow-up was similar to the original report; that is, with an IVC filter there is an equivalent trade-off of fewer PE at the cost of more DVTs, but also there is no difference in long-term morbidity (ie, postthrombotic syndrome) or mortality. Thus, the conclusion that “the systematic use of permanent vena cava filters in the general population with VTE is not recommended” seems justified.

What Decousus et al have established is that an IVC filter provides no additional net benefit to anticoagulation for the average patient with DVT with or without PE. These patients, however, are not the usual candidates for IVC filter placement. General indications support patients in whom anticoagulants cannot be used or those in whom anticoagulation has failed to prevent recurrent VTE. Some clinicians also advocate IVC filter placement for primary prophylaxis in patients considered to be at high risk for PE or as prophylaxis in patients with free-floating iliac thrombi. Although this study provides helpful information, it does not address the value of IVC filters versus alternative therapies in these situations in which it is commonly advocated.

Finally, the outcomes pertaining to the postthrombotic syndrome and death are not surprising, in that all patients in this study continued on oral anticoagulation for a minimum of 3 months, and 50% of patients were still taking a vitamin K antagonist at the end of 8 years. In addition, 24% of patients on entry to the study already had symptoms of the postthrom-
bolic syndrome, which potentially limited the differences between groups. Would these outcomes be the same if an IVC filter were used without concomitant anticoagulation, the most common situation in which they are used?

What conclusions can be drawn from this study, and what questions remain unanswered? We do not know which type of filter is best. We do not know precisely how long anticoagulation should be given, or whether it is necessary, when a filter is inserted. Finally, we have not tested in a systematic way the traditional indications for filter use against alternative means of treatment. We do not know whether a filter alone is better or worse than anticoagulation alone in selected patient groups. What we can say with some certainty, as indicated above, is that a vena cava filter does not significantly add protection in addition to anticoagulation in patients with DVT with or without PE. In selected subgroups with a predictably high rate of new or recurrent PE, however, filter placement along with anticoagulation may be of value, as suggested by Decousus et al.12

Finally, filter technology has advanced to the point that retrievable filters are available that can be removed several weeks or up to several months after insertion.14 This new technology presents a new set of questions. For instance, because 42% of the pulmonary emboli occurred in the first year of the “no-filter” group as compared with 22% in the “filter” group of the Decousus et al study,12 without a significant difference in recurrent DVT during this interval, temporary filter placement along with anticoagulation may be the optimal intervention. After 3 to 6 months the filter can be removed with continuation of the anticoagulation.

The long-term secondary prevention of venous thromboembolism is a story that evolves as new therapeutic agents or interventions enter the playing field. As such, some questions are answered, but new questions arise, and we still have much to learn.

Disclosure

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References


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