State of the Art Treatment for Deep Venous Thrombosis and Pulmonary Embolism with Temporary IVC Filters

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Reprinted from "Inside Radiology", A Quarterly Review from Mid-South Imaging & Therapeutics, P.A.", Summer 2005

Deep venous thrombosis (DVT) and pulmonary embolism (PE) continue to be a significant cause of morbidity and mortality despite improvements in diagnostic imaging and anticoagulation regimens. Pulmonary embolism is the most severe complication from deep venous thrombosis and is diagnosed in over 600,000 patients a year with as many as 150,000 deaths per year. The medical treatment of pulmonary embolism was revolutionized with the utilization of heparin. However, treatments have changed little in the last 20 years except for the recent increased usage of low molecular weight heparin. Because systemic anticoagulation has a risk of hemorrhage, albeit low, other methods for short-term protection from pulmonary embolism have been researched extensively. A temporary inferior vena cava (IVC) filter is one of the possible solutions.

The traditional indications for permanent IVC filter implantation have been contraindication to anticoagulation with known deep venous thrombosis, recurrent thromboembolism despite anticoagulation, large free floating iliocaval thrombosis, and patients with limited pulmonary reserve. Some patients, however, only need embolic protection for a limited time and in these patients temporary IVC filters are ideal.

The first modern IVC filter was introduced by Greenfield in 1972 and was inserted through a cut down through the right neck. Advancements in IVC filter technology allowed for both jugular and femoral percutaneous insertions. Filter development proceeded through the 80's and 90's with lower insertion profiles, new filter

designs, as well as new alloys being employed. In the past, physicians were reluctant to place IVC filters in patients due to the possibility of filter failure and fracture after long-term implantation. However, with new temporary filters, these complications may be avoided.

Two filters are available for temporary implantation, the Recovery filter by Bard and the Gunther–Tulip filter by Cook, Inc. Both of these filters have shown encouraging initial results regarding embolic protection with a low rate of filter migration and IVC thrombosis. The Recovery filter has been removed 200 days after implantation. With the advent of temporary filters, the indication for filter implantation has been greatly increased**. The current recommended indications for temporary IVC filter implantation are patients who cannot receive anticoagulation, patients greater than 45 age who have poor cardiopulmonary reserve, patients who have had one or more of the following injuries: closed head injury, spinal cord injury, complex pelvic fractures and multiple long bone fractures**.

In conclusion, IVC filters are relatively easy and safe to insert and appear to be effective in reducing occurrences of PE. Hopefully the use of new temporary filters will significantly reduce morbidity and mortality from thromboembolic disease.