Researchers find better management needed for use of IVC filters

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Researchers from Boston University School of Medicine (BUSM) have found that the use of Inferior Vena Cava (IVC) filters for the prevention and treatment of venous thrombotic events (VTE) may result in poor outcomes due to mechanical filter complications—largely due to low filter retrieval rates and inconsistent use of anticoagulants—and high rates of venous thromboembolism. The study, which was conducted at New England's largest trauma center, Boston Medical Center (BMC), currently appears on-line in *JAMA Internal Medicine* and is believed to be one of the first to retrospectively review retrieval options of IVC filters.

In response to this study, BMC is now using a multi-disciplinary team approach to achieve the tracking and timely retrieval of these filters, incorporating specialists from vascular surgery, interventional radiology, cardiology and hematology. BMC is one of a small group of hospitals nationwide to define and address the problem, as well as implement a system to tackle this national safety issue.

IVC filters are used to prevent pulmonary embolism, a potentially fatal condition where a blood clot breaks off from one of the large veins in the legs and lodges in the lungs. They are generally used only when people are unable to safely receive blood thinning medications. Most filters are designed to be temporary, meaning that they should be removed when the risk of pulmonary embolism has subsided.

National data has shown that many IVC filters are left in place

indefinitely. Despite a lack of randomized, controlled trials demonstrating their long-term safety and efficacy, the use of IVC filters continues to increase each year.

In the study, a review of IVC filter usage between August 2003 and February 2011 was conducted at BMC. During that timeframe, IVC filters were placed in 978 patients. Charts were reviewed to determine the indication for filter placement, use of anticoagulant medication, complications resulting from filter placement and details regarding patient follow up and filter retrieval.

Of 679 potentially retrievable IVC filters inserted, only 8.5 percent were successfully removed. Unsuccessful retrieval attempts were made in 18 percent of patients. VTEs occurred in 7.8 percent of patients after filter placement, including 25 pulmonary emboli, all of which occurred with the filter in place. Forty-eight percent of VTEs were in patients without venous thromboembolism at the time of filter placement and 89 percent occurred in patients without anticoagulation. Many filters placed after trauma, were inserted when the highest bleeding risk had subsided and anticoagulation may have been more appropriate. While many of these filters were placed due to a perceived contraindication to anticoagulation, 25 percent of patients were discharged on therapeutic anticoagulation.

According to the researchers, more than 259,000 filters were inserted in 2012 and while many professional groups have guidelines regarding filter insertion, they vary widely and often conflict. The American College of Radiology and Society of Interventional Radiology Guidelines state that a filter can be placed as prophylaxis for any patient at high-risk of developing deep venous thrombosis (DVT) or pulmonary embolism, while the American College of Chest Physicians guidelines recommend against an IVC filter unless the patient has an acute proximal lower extremity DVT and cannot be anticoagulated. "These conflicting

guidelines reflect the absence of good quality data to guide clinical practice," explained senior author J. Mark Sloan, MD, an assistant professor of medicine at BUSM and a hematologist/oncologist at BMC.

Sloan stresses that this study highlights the importance of an institution developing a proper protocol for the safe retrieval of these filters. "As a result of these findings, a 'filter insertion procedure note' that specifies the indication for filter placement and the anticipated duration of placement is now mandatory for all IVC filter insertions at BMC. Patients are also given educational material after filter placement stating that most filters should be removed once the risk for blood clots has subsided or anticoagulation is tolerated."

At BMC, every IVC filter is now promptly entered into a central interdepartmental registry and tracked until retrieval. In addition, for filters not deemed permanent at the time of insertion, a designated administrator schedules timely retrieval or a clinic visit specifically to assess for the appropriateness and timing of retrieval. Since this new protocol went into effect at BMC, 47 filters have been inserted. Of the 36 eligible for retrieval, 10 have been successfully retrieved. However, not all patients whose filters are currently in the BMC database are eligible for retrieval at this time.

Another example of the hospital's commitment to this important issue was a BMC patient safety grant that was awarded to Dr. Jeffrey Kalish, BMC's Director of Endovascular Surgery, for his work titled "Retrieval of IVC Filters to decrease associated complications".

"BMC is leading the way to improve safety for our patients," said Stanley Hochberg, MD, senior Vice President for Quality, Safety and Technology and Chief Quality Office at BMC. "Our leadership in this area will prove invaluable for all patients and may become the model for other institutions to follow," he concluded.

Provided by Boston University Medical Center