Indications for Inferior Vena Cava Filter Placement: Do Physicians Comply with Guidelines?

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ABSTRACT

Purpose: Inferior vena cava (IVC) filter placement has increased significantly over the past few decades, but indications for filter placement vary widely depending on which professional society recommendations are followed, and it is uncertain how compliant physicians are in adhering to guidelines. This study assessed documented indications for IVC filter placement and evaluated compliance with standards set by the American College of Chest Physicians (ACCP) and the Society of Interventional Radiology (SIR).

Materials and Methods: A single-center, retrospective medical record review in a metropolitan, 652-bed, acute care, teaching hospital. Inpatient filter placement over a 26-month period was reviewed. The study measured compliance with established guidelines, relationship of medical specialty to filter placement, and evaluation of self-referral patterns among physicians.

Results: Compliance with established ACCP guidelines was poor regardless of whether the IVC filter insertion was performed by interventional radiology (IR; 43.5%), vascular surgery (VS; 39.9%), or interventional cardiology (IC; 33.3%) staff. Compliance with the less restrictive SIR guidelines was better (77.5%, 77.1%, and 80% for IR, VS, and IC, respectively). There was a greater degree of guideline compliance when filter placement was recommended by internal medicine (IM)–trained physicians than by non–IM-trained physicians: 46.3% of IR-placed filters requested by IM physicians met ACCP criteria whereas only 24.0% of filters recommended by non-IM specialties were compliant with criteria ($P = .03$). In the VS group, these compliance rates were 45.8% and 31.5%, respectively ($P = .03$). Among IR-placed filters, 84.0% of IM-recommended filter placements were compliant with SIR guidelines, versus only 48.0% of non–IM-recommended placements ($P \leq .001$). In the VS group, these compliance rates were 87.8% and 69.6%, respectively ($P \leq .001$).

Conclusions: There is poor physician compliance with guidelines for IVC filter placement. Most filter indications meeting SIR guidelines are for patients classified as "falls risks," failures of anticoagulation, patients with limited cardiopulmonary reserve and patients non compliant with anticoagulation medications. This single-center study suggests a need for harmonization of current guidelines espoused by professional societies.

ABBREVIATIONS

ACCP = American College of Chest Physicians, DVT = deep vein thrombosis, FDA = Food and Drug Administration, IC = interventional cardiology, IM = internal medicine, IR = interventional radiology, IVC = inferior vena cava, PE = pulmonary embolism, PREPIC = Prevention du Risque d'Embolie Pulmonaire par Interruption Cave [study], VS = vascular surgery, VTE = venous thromboembolism

Inferior vena cava (IVC) filters have increased in use, with interventional radiologists, vascular surgeons, and interventional cardiologists performing the procedure regularly within the United States. The number of patients who have received IVC filters in the United States for the prevention of pulmonary embolism (PE) has increased from 2,000 in 1979 to 49,000 in 1999, and there has been a threefold increase from 2001 to 2006 (1,2). For the estimated 350,000 Americans experiencing venous thromboembolism (VTE) each year, anticoagulation is the standard therapy, with IVC filters being used only as alternative or adjunctive therapy to prevent PE (3). However, IVC filters are not without risk. Complications (occurring in 1%–3% of placements) include improper anatomic placement of the filter, migration, caval stenosis or filter narrowing, caval occlusion, air embolism, penetration of the caval wall, and lower-extremity

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Table 1. ACCP/SIR Guidelines: Indications for IVC Filter Placement (10,11)

ACCP: Evidence-based clinical practice guidelines (10)

A. Vena caval filters for the initial treatment of DVT: for patients with acute proximal DVT, if anticoagulant therapy is not possible because of the risk of bleeding, placement of an IVC filter is recommend (grade 1C).

B. In children > 10 kg body weight with lower-extremity DVT and a contraindication to anticoagulation, placement of a temporary IVC filter is suggested (grade 2C).

C. Vena caval filters for the initial treatment of PE: in patients with acute PE, if anticoagulant therapy is not possible because of risk of bleeding, placement of an IVC filter is recommended (grade 1C).

D. For patients with CTPH undergoing pulmonary thromboendarterectomy, placement of a permanent vena caval filter before or at the time of the procedure is suggested (grade 2C).

SIR: Indications and contraindications for all vena cava filters (11)

Absolute indications (proven VTE): recurrent VTE (acute or chronic) despite adequate anticoagulation, contraindication to anticoagulation, complication of anticoagulation, inability to achieve/maintain therapeutic anticoagulation

Relative indications (proven VTE): iliocaval DVT, large, free-floating proximal DVT, difficulty establishing therapeutic anticoagulation, massive PE treated with thrombolysis/thrombectomy, chronic PE treated with thromboendarterectomy, thrombolysis for iliocaval DVT, VTE with limited cardiopulmonary reserve, recurrent PE with filter in place, poor compliance with anticoagulant medications, high risk of complication of anticoagulation (eg, ataxia, frequent falls)

Prophylactic indications (no VTE, eg, primary prophylaxis not feasible as a result of high bleeding risk, inability to monitor the patient for VTE): trauma patient with high risk of VTE, surgical procedure in patient at high risk of VTE, medical condition with high risk of VTE

Contraindications to filter placement: no access route to the vena cava, no location available in vena cava for placement of filter

ACCP = American College of Chest Physicians, CTPH = chronic thromboembolic pulmonary hypertension, DVT = deep vein thrombosis, IVC = inferior vena cava, PE = pulmonary embolism, VTE = venous thromboembolism.

edema (4). As with any procedure, operator subspecialty training and experience likely play a role in the complication rate. The randomized Prevention du Risque d'Embolie Pulmonaire par Interruption Cave (PREPIC) study (5) concluded that nonretrievable filters reduced the risk of PE but increased the risk of deep vein thrombosis (DVT) and had no effect on survival. All patients in the study (5) were treated with anticoagulation.

Although metaanalyses of randomized controlled trials provide the strongest basis for guidelines and recommendations, a majority of published data on vena cava filters come from observational studies, which often lack a control group (6). The first randomized controlled trial evaluating the efficacy of prophylactic IVC filters in trauma patients is still ongoing, and the PREPIC 2 study is expected to be reported later in 2012 (7,8). With the scarcity of strong evidence, the decision to insert an IVC filter is often controversial. One study (9) determined that IVC filter placement was appropriate in only 51% of cases according to an expert panel.

The principal guidelines for IVC filter placement are published by the American College of Chest Physicians (ACCP) and the Society of Interventional Radiology (SIR), with the ACCP guidelines being more restrictive than the SIR guidelines (**Table 1**) (10,11). Both these guidelines are consensus guidelines that are primarily based on consensus of experts, with minimal level I supporting data. The ACCP advocates the use of IVC filters in patients with DVT or PE when anticoagulant therapy is not an option as a result of an excessively high risk of bleeding, whereas SIR has instituted a list of absolute, relative, and prophylactic indications for filter placement.

We conducted this study in a cohort of 499 patients to determine if IVC filters inserted by interventional radiology (IR), vascular surgery (VS), and interventional cardiology (IC) personnel were placed in compliance with the current guidelines.

MATERIALS AND METHODS

Study Design and Study Period

This is a single-center retrospective medical record review of all patients who received an IVC filter over a 26-month period (January 20, 2008, to April 5, 2010) with data collection and analysis performed after the study period. The study was performed in a metropolitan, 652-bed, acute-care teaching hospital. The study was approved by the institutional review board and a waiver of consent was obtained for this Health Insurance Portability and Accountability Act–compliant study.

Study Participants and Data Source

The study included all hospitalized patients who had a filter placed within the aforementioned dates with the procedure performed by IR, IC, or VS staff. A search was performed within the study time parameters for code 38.7 of the International Classification of Diseases, Ninth Revision, Clinical Modification, "interruption of the vena cava, inser-