Letter to the Editors-in-Chief

The infrequent removal of retrievable IVC filters

Dear Editors,

On August 9, 2010, the US Food and Drug Administration (FDA) issued a safety communication warning that retrievable Inferior Vena Cava (IVC) filters, which are intended for short-term placement are not always removed once the risk for pulmonary embolism or the contraindication for anticoagulation subsides [1]. The warning was based on the FDA’s concerns about the increasing number of device adverse reports involving IVC filters including device migration, embolization and IVC perforation. The FDA encouraged all physicians caring for recipients of IVC filters to consider risks and benefits of filter removal for each patient. However, to date, there are no clear or strict guidelines on the proper use and timely removal of IVC filters. The incidence of IVC filter insertion has increased significantly over recent years, especially since the availability of retrievable filters. It is estimated that in 2007, almost 167,000 IVC filters were implanted in the United States compared to only 2000 in 1979, and that in 2012, almost 259,000 filters would be deployed [2]. This dramatic increase in the utilization of IVC filters was not accompanied by efforts to ensure proper follow up and timely retrieval. To our knowledge, the only long-term randomized controlled trial of IVC filters for the prevention of pulmonary embolism was the PREPIC (Prevention du Risque d’Embolie Pulmonaire par Interruption Cave) study [3]. A total of 400 patients with proximal deep-vein thrombosis were followed initially for two years. The insertion of an IVC filter in combination with standard anticoagulation was associated with a reduction in the incidence of pulmonary embolism compared with anticoagulation alone. However, this beneficial effect was counterbalanced by a significant increase in deep vein thrombosis and there was no survival advantage in the combination group. In addition, the lower incidence of pulmonary embolism at 12 days post filter insertion was no longer apparent at 2 years. An 8 year follow up study showed the persistent increased risk of deep-vein thrombosis and no survival advantage with the use of IVC filters [4]. Given that the benefit of IVC filters appears to be short-term, the option of removing the filter when it is no longer necessary is highly appealing. However, the actual rate of filter removal remains low. In a retrospective study conducted by Gaspard et. al, the rate of removal of retrievable IVC filters was only 3.7% [5]. Another study looking specifically at trauma patients found that only 20% of filters were removed [6]. A recent retrospective study performed in a single institution in Australia found that the rate of follow up after IVC filter placement was 39% and the rate of the attempt to removal was 26.8% [7].

We hypothesized that the availability of an electronic medical record (EMR) system might improve the retrieval rate and, therefore, conducted a retrospective chart review using the EMR at the Veterans Administration (VA) hospitals in Washington, DC and Baltimore, MD and identified patients with retrievable IVC filters placed between January 1, 2006, and September 1, 2011. A total of 85 patients were identified. We obtained information on the retrieval rates of IVC filters and follow up after placement of IVC filters and evaluated documentation of the event on the patient’s problem list. We observed that the incidence of IVC filter placement has doubled over the 5 years of the study period. However, of the 85 patients with retrievable IVC filters placed during the study period, only 6 patients (7%) underwent IVC filter removal. All removal attempts were successful and there were no complications related to IVC filter removal. Only 21 patients (24.7%) had the IVC filter documented on the problem lists of their charts (Fig. 1). We observed that a patient was twice as likely to have the IVC filter removed if it was documented on the problem list. The Veterans Health Information Systems and Technology Architecture

Fig. 1. Upper figure: Number of IVC filters removed (n=6) or not removed (n=79) during the study period. Lower figure: Number of IVC filters documented (n=21) or not documented (n=64) in the problem list.

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(VistA) Electronic Medical Record (EMR) system is an advanced EMR that is standardized at all VA Medical Centers. Despite the availability of this system, the retrieval rate is low and the EMR is underutilized for this function. One of the proposed reasons for the low IVC filter removal rate is absence of a standardized routine for reassessment of the need for retaining the IVC filter after placement.

Lack of proper follow up is often mentioned in the literature as a probable cause of the low removal rate of retrievable IVC filters. A study conducted by Lee et al. found an improvement, although not significant, in retrieval rates of IVC filters with the implementation of a proactive interventional radiology follow up program [8]. Another study by Minocha et al. found an improvement in the retrieval rate of IVC filters, from 29% to 60%, with the establishment of a dedicated IVC filter clinic [9]. A recent study by Kalina et al., which included trauma patients with IVC filters, showed a significant improvement in the rate of retrieval of IVC filters from 15.5 to 31.5% through improved documentation by creating an IVC filter registry [10].

In the era of the EMR, we have hypothesized that an electronic alert system should be an ideal tool for increasing the rate of IVC filter removal and thus preventing long-term complications. Therefore, we have designed a prospective study which will evaluate the utility of such an electronic alert system. Each patient with an IVC filter inserted by the VA DC Medical Center Interventional Radiology (IR) Section will automatically be accompanied by an e-(electronic) consult sent to the Hematology Section three months following the IVC filter placement, which will require reevaluation of the continued need for the IVC filter. If no longer required, a consult will be sent to IR requesting evaluation of the filter for removal. In addition to the e-consult, a clinical reminder will be placed in the EMR stating that the patient has an IVC filter allowing other physicians to be reminded of the presence of the filter alerting them to reevaluate the ongoing need for the filter at each visit.

We are preparing to initiate this study and predict that such an alert system will improve the IVC filter retrieval rate. If successful, this automated system could be easily replicated at other VA hospitals across the United States and could be adapted to other EMR systems.

Conflict of interest statement

All authors have no conflict of interest.

References


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22 December 2012