Right Ventricular Migration of a Retrievable Inferior Vena Cava Filter: A Case Report

Lockhart Z, Odonkor P
University of Maryland School of Medicine, Baltimore, MD, USA

Introduction: IVC filter migration is not uncommon. We present the case of a migrated IVC filter causing malignant arrhythmias requiring surgical retrieval.

Case Presentation: A patient presented with headache (HA) after trauma. He had prior intracranial colloidal cyst removal. His postoperative course was complicated by pulmonary embolism (PE). CT scan showed acute bilateral subdural hematomas with minimal midline shift. He had pre-deployment venography a TrapEase IVC filter inserted. He presented 2 weeks later with HA and ventricular tachycardia with hemodynamic instability. A transthoracic echo (TTE) revealed a foreign object in the right ventricle (RV). Percutaneous retrieval of the filter was not attempted. He underwent surgical retrieval of the IVC filter. Intraoperative transesophageal echocardiography (TEE) confirmed the position of the IVC filter in the RV with mild to moderate tricuspid regurgitation (TR) and no pulmonic valve injury or RV dysfunction. The TV was intact. The IVC filter was removed. He developed extensive DVT postoperatively and was treated by thrombolysis.

Discussion: Indications for IVC filters include a history of DVT or PE with contraindication to anticoagulation, failure of anticoagulation therapy, or proximal thrombus or debris extending into the IVC. IVC filters may be placed prophylactically in patients who are at high risk for development of DVT or PE. Complications from IVC filter placement include filter migration but improvement in strut design and matching size of filter to size of IVC has helped reduce its incidence. In a review of published data on intracardiac migration of IVC filters, Owens et al reported on 98 cases identified in 77 publications. 20 cases involved the Kimray-Greenfield filter and 2, the TrapEase filter. 23% of the patients were asymptomatic whilst 77% presented with cardiac arrhythmias, chest pain, dyspnea, and/or hypotension. 43 of the filters were in the right atrium (RA), 19 in the TV, 20 in the RV and 15 in the pulmonary artery. Causes for filter migration included operator error, device failure, large clot load in the filter and IVC diameter greater than 28-30 mm. Evaluation includes chest x-ray, CT scan and fluoroscopy. TTE and TEE confirm location of the filter and assess associated injuries. Published clinical trial on the TrapEase reported no filter migration. Management of IVC filter migration includes observation, percutaneous or surgical retrieval in symptomatic patients. In his review, Owens et al reported that endovascular retrieval was attempted in 42 of 98 patients and 31 were successful. Decision for surgical retrieval depends on presentation, anatomic location, and associated injury. The endovascular approach is minimally invasive and should be done with cardiac surgery on standby.

References
Figure 1: Chest CT scan showing IVC filter in the heart

Figure 3: TEE Mid esophageal view of IVC filter in the right ventricle
Figure 4: TEE Mid esophageal view RV inflow-outflow tract showing the IVC filter in the right ventricle with associated tricuspid regurgitation.

Figure 5: TEE Mid esophageal RV inflow-outflow view after IVC filter retrieval with improvement of tricuspid regurgitation.
Figure 6: TEE Mid esophageal view showing no IVC filter in the right ventricle