SHORT REPORT

Migration of a New IVC Filter to the Right Atrium: a Case Report

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Introduction

The use of inferior vena cava (IVC) filters has been an accepted method for preventing pulmonary embolism, especially in cases where there are contraindications to anticoagulation.1 Numerous complications of IVC filters have been described, including caval perforation, thrombosis, myocardial infarction and migration.2 These complications can be fatal. The incidence of migration has been reported to be as high as 6%.3 This complication has been managed on cardiopulmonary bypass. The quality of a filter is judged by its clot trapping efficiency and low frequency of caval thrombosis and migration. The design of the filter has undergone a considerable change in the hope of improving its efficiency. The “Antheor” permanent IVC filter has recently been introduced and is designed to minimise the chances of migration. We describe a case where it has not been successful.

Case Report

A 47-year-old man, who had neurosurgery for melanoma secondaries of his frontoparietal lobe, developed multiple episodes of pulmonary embolism following surgery. The thrombus extended from the left iliac vein into the IVC. As anticoagulation was contraindicated, an “Antheor” 28 mm permanent IVC filter was deployed in the IVC through the right femoral vein. The filter was successful in preventing further episodes of pulmonary embolism. However, 2½ weeks later he developed chest pains, tachycardia, dyspnoea and hypotension, suggesting another episode of pulmonary embolism. A chest X-ray showed that the filter had migrated into the right atrium (Fig. 1).

The patient was transferred urgently to our unit, where he was taken to theatre immediately. Following a median sternotomy, normothermic cardiopulmonary bypass was established using superior and inferior vena cava cannulae. The right atrium was opened and the filter removed without difficulty. It was covered in thrombus. The pulmonary artery was opened and both branches were explored with a Fogarty

Fig. 1. CXR: filter seen within the right atrium.

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balloon catheter without any yield of thrombus. The catheter was also passed down the IVC where no thrombus was found. Cardiopulmonary bypass was discontinued after closing the pulmonary artery and the right atrium. Post-operatively inotropic support was required for a short while due to poor right ventricular performance. He returned to the ward the following day and made an uneventful recovery.

Discussion

The “Antheor” IVC filter was obviously efficient at trapping thrombus. Although its design is such that its tines face both directions to minimise migration, it was not successful in this case. Embolisation of an “Antheor” filter to the pulmonary artery has been previously reported. Furthermore, sudden death in a patient caused by migration of an “Antheor” vena cava filter to the heart has also been reported. In our patient, however, the filter only embolised as far as the atrium and it was not fatal. The symptoms in this patient could be explained by diminished return of blood to the heart. The symmetrical shape of the “Antheor” permanent vena cava filter promotes clot capture and maintains caval patency, but sometimes massive thrombus mass combined with the filter itself forms an obstructive plug in the IVC. The resultant higher pressures on the filter may play a part in driving the filter to migrate. If this mechanism is correct it may be difficult for a filter to resist migration. Hence, the design may need to be modified. However, experience with this filter may allow a better comparison of its efficacy and migration rate with other models.

References