Vena caval filters: keeping big clots down

Pulmonary emboli are usually unexpected, and research has concentrated on eliminating the source, deep vein thrombosis.¹ Once a deep vein thrombosis has developed we rely heavily on anticoagulation, even though evidence that this works is poor.² Surgeons have thus been attracted by the idea of trapping clots in the leg or pelvic veins, where they are no threat to life. After an unproductive flirtation with femoral vein ligation, vena caval occlusion was favoured for several years. As this prevented large pulmonary emboli the consequent swelling of the legs was tolerated despite the high morbidity and mortality of retroperitoneal operations in severely ill and anticoagulated patients. This policy was, however, misguided as we now know that multiple small pulmonary emboli may shower into the lungs via large collateral veins in 30-50% of patients.³

The current vogue for intraluminal filters began with the Mobin-Uddin umbrella (figure), which is passed under radiographic control via the internal jugular vein through the right atrium and lodged in the inferior vena cava below the renal veins.⁴ Blockage by a large embolus tends, however, to

The Mobin-Uddin filter (left) may be displaced from the inferior vena cava when a large embolus occludes the filter and causes distension. In the Kimray-Greenfield filter (right) emboli would be captured centrally and usually lyse without obstructing the inferior vena cava.

dilate the inferior vena cava and collapse the original 23 mm umbrella, occasionally causing disastrous displacement into the heart or pulmonary artery. The introduction of a heparin bonded 28 mm filter reduced this risk, but caval occlusion still occurred in about half of patients, leading to the expansion of collateral veins through which emboli could pass.⁴

These problems were solved by the ingeniously simple, though expensive (about £850), Kimray-Greenfield vena caval filter (figure). This resembles a spider with six stainless hairpin like legs forming a cone into which emboli may lodge without occluding blood flow. Large emboli force the

terminal hooks on these spring loaded legs deeper into the vein wall and prevent migration.⁵ As the embolus lyses no collateral veins develop, and blood from the legs continues to be filtered.⁶ Insertion via either the femoral or internal jugular veins has been eased by redesigned catheters from which the filter is ejected.⁷ Complications are few and usually result from inaccurate placement and occasionally from tears in the inferior vena cava. In 156 patients who either had a proved pulmonary embolus but were unable to take anticoagulants or who had recurrent emboli despite anticoagulation only 2% had further emboli after filter insertion; and in 148 the inferior vena cava was patent after two years.⁸

Although many thousands of these devices are placed in France and the United States, we do not know for certain when they should be inserted. Certainly they should not be inserted in all patients with pulmonary emboli as recurrence may be reduced to under 5% by anticoagulants alone.⁹ In my view, the main indication is proved pulmonary embolism despite adequate anticoagulation. A filter should also be inserted into a massive free floating clot in a large vein. Recurrent pulmonary emboli should be confirmed by looking for a change on a ventilation-perfusion scan or by pulmonary angiography. The source of emboli in the legs or pelvic veins must be determined by venography or by using indium-111 labelled platelets.¹⁰ The filter should then be placed immediately and long term anticoagulants continued where possible to protect inferior vena cava patency and control the original deep vein thrombosis. Although emboli smaller than 5 mm may slip through, I find it easier to sleep at night knowing that a clot big enough to swell a leg can no longer pass to the lungs.

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Telling patients about their medicines

Three out of four people consult their general practitioner each year; on average men visit him three times¹ and women more often. Two thirds of consultations end with the prescription of a medicine, and patients need to know certain things about the medicines if they are to derive maximum benefit.² Yet studies from North America and Britain have shown that patients' knowledge about their medicines is very limited.³⁻⁷

Doctors and pharmacists have a shared responsibility to