

PE PROPHYLAXIS WITH RETRIEVABLE IVC FILTERS

by **Dr Eisen Liang**

Annually there are approximately 14,000 hospitalisations in Australia where PE is reported. Assuming a case fatality rate of 15 per cent, this means more than 2000 deaths from PE annually across Australia. PE is regarded as one of the single most common preventable causes of hospital death, accounting for or contributing to 10 per cent of all deaths in hospital.

IVC filter has a significant role in preventing PE. The established indications for IVC filter placement are: presence of contraindication to anticoagulation (see table 1), failure of anticoagulation to prevent recurrent PE or propagation of DVT, and complication of anticoagulation.

There is no doubt that IVC filters are effective in preventing PE. In the presence of a filter, the incidence of recurrent PE is 2-4%, based on meta-analysis of more than 6,500 IVC filter insertions, including almost 90 different studies. Filter and anticoagulation is five times more effective in preventing PE than anticoagulation alone.

The conventional permanent IVC filter has a caval occlusion rate of 2-10%. The recurrent DVT rate is also increased in the presence of filter. Therefore there is a quest for an ideal filter which protects the patient from PE during the vulnerability period, and can be retrieved once the patient is safely anticoagulated or when the risk of PE is no longer present.

The retrievable filters are the ideal filters. They are inserted to cover the risky period. There is an option to retrieve, or to leave it in as a permanent filter if so desired.

Both the insertion and retrieval can be performed as short stay day case in SAN Radiology. Under local anaesthetics and conscious sedation, insertion can be performed via femoral or jugular approach. Retrieval is usually via jugular approach, using a snare or specially designed retrieval cone. Proper digital subtraction venography and high quality fluoroscopy are essential for safe insertion and retrieval. Real-time ultrasound

guided micropuncture of the internal jugular vein enable the procedure to be performed without full reversal of anticoagulation.

There are several retrievable filters on the market. The choice depends on the duration of IVC filtration required and the preferred approach of insertion (femoral or jugular). The new nitinol filter (BARD Recovery Filter) is retrievable up to 161 days after insertion. Of the 45 patients in the initial study, there was no retrieval failure or complication with an average of 60 day duration, and there was no recurrent PE or IVC thrombosis. The COOK Gunter-Tulip filter has been available since the 90's. It has the advantage of the option of jugular insertion. The retrieval failure rate is around 9% for an average of 60 day duration. Shorter duration is associated with higher rate of retrieval success.

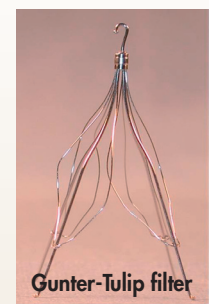
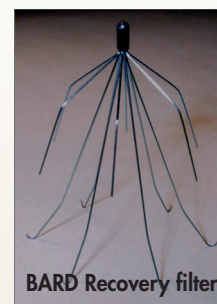
After filter placement, the patient's condition should be regularly reviewed. Anticoagulation if indicated should be introduced. The filter should be removed as soon as indications for IVC filtration are no longer present.

With the advent of retrievable IVC filters, the concern of life long IVC filtration and the risk of IVC thrombosis and recurrent DVT can be alleviated. There are now expanded indications for IVC filters: presence of extensive/floating thrombus; to cover thrombolysis for DVT and PE; as prophylaxis to cover high risk patients going for elective surgery (especially lower limb orthopaedic surgery); patient with poor cardiopulmonary reserve; trauma patients with head and spinal injuries or pelvic and lower limb fractures; and patients with malignancy.

In conclusions, the mainstay of prevention and treatment of venous thromboembolic disease remains anticoagulation. IVC filter is indicated when there is contraindication to anticoagulation, failure of anticoagulation or complication of anticoagulation. With the advent of modern retrievable IVC filters, the indications for caval filtration can be expanded to include PE prophylaxis in high risk elective surgery and trauma.

Table 1. Contra indications to Anticoagulation

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| <i>Bleeding complication of anticoagulation</i> |
| <i>Heparin-associated thrombocytopenia thrombosis syndrome</i> |
| <i>Recent major trauma or surgery</i> – head and spinal cord injury – pelvic, and lower-extremity fractures |
| <i>Hemorrhagic stroke</i> |
| <i>Thrombocytopenia (<50,000/mm³)</i> |
| <i>Positive faecal occult blood</i> |
| <i>Central nervous system neoplasm, aneurysm, or vascular malformation</i> |



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