Background

- Inferior vena cava (IVC) filters are an effective second-line treatment for patients with venous thromboembolic disease in which anticoagulation is ineffective or contraindicated.
- IVC filters may be placed temporarily or permanently depending on clinical indication.
- In general, when placed temporarily, the time from insertion to retrieval should be in line with manufacturer’s recommendations. For example, Cook Günther Tulip filters should be removed within 12 weeks and Cook Celect filters within 52 weeks.
- Mean retrieval rate of filters in literature is variable and a review of >6800 patients with filters reported this as being 34%.
- There is increased risk of filter embedment and retrieval failure following prolonged filter dwelling.
- The aim of this audit was to evaluate IVC filter retrieval with reference to accepted standards of clinical practice.

Audit standards

- Standards were based on recommendations by the Royal College of Radiologists (RCR), British Society of Interventional Radiology (BSIR) and filters’ manufacturer as follows:
  1. 100% of temporary IVC filters should undergo attempted retrieval.
  2. Time to retrieval for 100% of temporary filters should be within manufacturer’s recommendations.
  3. IVC filter retrieval success rate should be ≥80%.

Methods

- This is a retrospective audit of all adult patients (age ≥16) who had undergone insertion of a Cook Günther Tulip or Cook Celect IVC filter between 1st January 2012 and 31st December 2014 at a single institute (Barts Health NHS Trust, UK). Patients were identified by using the Picture Archiving and Communication System (PACS). Data collected included: indications, date of insertion and removal, type of filter used and complications during and/or after filter placement and retrieval.
- An intervention was put into effect and a re-audit took place in April 2016 with data collected on all filters inserted between 1st January and 31st December 2015.
- Statistical analysis comparing results of 1st and 2nd cycles was performed using a chi-square test. A 2-sided p-value of less than 0.05 was considered statistically significant. All statistical data analysis was performed using GraphPad (GraphPad Software) v.7.0.

Results – 1st cycle

1st Action plan

- At 6 weeks contact the clinician that requested filter insertion. Organise IVC filter retrieval if clinically appropriate.
- Re-audit in one year’s time.

Results – 2nd cycle

1st Action plan

- Improve follow-up rate by creating a local registry of all temporary IVC filters inserted.
- Educate the referring team on the indications for temporary and permanent filters respectively.
- Re-audit in one year’s time.

Results – 1st vs 2nd cycle

19% non-statistically significant relative increase (p=0.63) in retrieval success rate from 1st cycle. Still meeting the standard as target is 100%.

2% non-statistically significant relative increase (p=0.23) in retrieval success rate from 1st cycle. Still meeting the standard as target is ≥80%.

Discussion and Conclusion

- Following the implementation of the action plan, there was a statistically significant improvement in time to retrieval and this area now meets the second standard.
- Rate of successful retrieval was above the third standard during both cycles.
- A non statistically significant improvement occurred in terms of rate of attempted retrievals, which remains suboptimal at our institution. Reasons for this are unclear but they may include inadequate follow-up by the IR team or patients being transferred.
- A limitation is that it is unknown as to whether patients lost to follow-up, for e.g., those who were transferred to other hospitals following IVC filter insertion, underwent attempted filter retrieval outside our institution.

References: