What to do With Fractured Filters and Embolic Filter Fragments

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IVC Filter Utilization in the US


What Is Present Controversy with IVC Filters?

- Retrievable filters appear to prevent PE (1.7%)
- 2001-2011 concern for high rate of penetrations, fractures, migrations (MAUDE database)
- Filter removal rates are quite low (20% - 30%)

Complications of IVC Filters

- Device Related Complications
  - Migration
  - Embolization
  - Perforation
  - Fracture

Disclosures

- Consultant:
  - C. R. Bard
  - Boston Scientific
  - Philips Healthcare
  - Avanos
- Speaker/Teaching:
  - Cook Medical
  - W.L. Gore
  - Penumbra
  - Medtronic
  - C. R. Bard
  - Abbott
- Investor
  - Cagent medical
  - Integrity Medical
  - Brightwater medical
IVC Filter Fracture - Why?
- Strut fractures reported in 1-3% of filters
  - thought to be related to perforation and longer dwell times
- How much of “FF” filter related and how much is patient related?

Why do we see fractures?

How to approach IVC Filter removal and possible Fracture
- When removing a filter assume it may be fractured or going to fracture
- Obtain pre-removal scout films and oblique views
- Know the filter being removed! How many legs?
- Be prepared to remove fracture fragments

Tools for Removal
- Endobronchial Forceps
  - Grasping ability
  - Dissect tissue from an embedded filter top
- Snares
- 16 French Sheaths

Endo-bronchial Biopsy Forceps
- Use to dissect the filter from caval wall-embedded filter
- Grasp filter after dissection
- Comes in 1.5 mm (10Fr)/3 mm (12Fr)
- Lymol (model 4162)
- Use a Cook 16 French sheath
Rate of Success

- Not 100% successful if chronic
- May require a second attempt
- Acute fragment likely easiest at the time

Management of Fractured Inferior Vena Cava Filters:
Outcomes by Fragment Location

- 65 pts
- 116 fragments: 78 fragments attempted
- Successful in 63/78 (81%)
- Extravascular fragments retained
- 50% fragment free

Endovascular Removal of Fractured Inferior Vena Cava Filter Fragments: 5-Year Registry Data with Prospective Outcomes on Retained Fragments

- 82 consecutive pts
- 185 fragments: 47% deemed amenable
- Successful in 78/87 (90%)
- 1 cardiac tamponade
- Cardiopulmonary fragment asymptomatic in 81% pts

Cardiopulmonary fragment asymptomatic in 81% pts

- 65 yo asymptomatic female with a 10 year old Eclipse IVC filter and a filter fragment in the Right lower lobe PA branch
57 yo Female with history of Breast CA and Factor V Leiden presents with an IVC filter placed 8 years ago after a DVT on anticoagulation.
22 yo F with bilateral leg swelling with a filter placed 2 years previously after a MVC with liver laceration and DVT
65 year old male with Painful and malpositioned filter
3 months later

28 year old male with attempted filter removal was transferred for removal
Conclusion

- A fractured filter and filter fragment at risk for embolization
- May occur during standard removal
- Document, document, document!
- Removal of these filters usually requires proper tools and control of fragments
- Some fragments may be best left alone