What to do with Fractured Filters and Embolic Filter Fragments?

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Disclosures
- Advisory Board:
  - C. R. Bard
  - Boston Scientific
- Speaker/Teaching:
  - BTG
  - Cook Medical
  - Penumbra
  - Medtronic
  - C. R. Bard

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
IVC Filter Fracture

- Strut fractures reported in 1-3% of filters
  - thought to be related to perforation and longer dwell times
- Is the fractured fragment symptomatic?

Why do we see fractures?

- Risk of Filter and Filter Fracture fragment embolization?
- What is the risk of a fractured strut of embolizing?
  - Within the wall (immobilized, incorporated)
  - Role of CT imaging to see adjacent structures
    - Role of Cone Beam CT venography
- What is risk of an embolized fragment?
  - Ventricle or Pulmonary Artery

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
- Grasp filter after dissection
- Comes in 1.5 mm (10Fr)/3 mm (12Fr)
- Use a reinforced 16 French sheath
Rate of Success
• Not 100% successful
• May require a second attempt

Retained Fragment after complex IVCF removal

Conclusion
• A fractured filter and filter fragment at risk for embolization
• Removal of these filters usually requires proper tools and control of fragments
• CT Venogram helpful
• Not always possible or necessary to remove fragments if incorporated in the wall