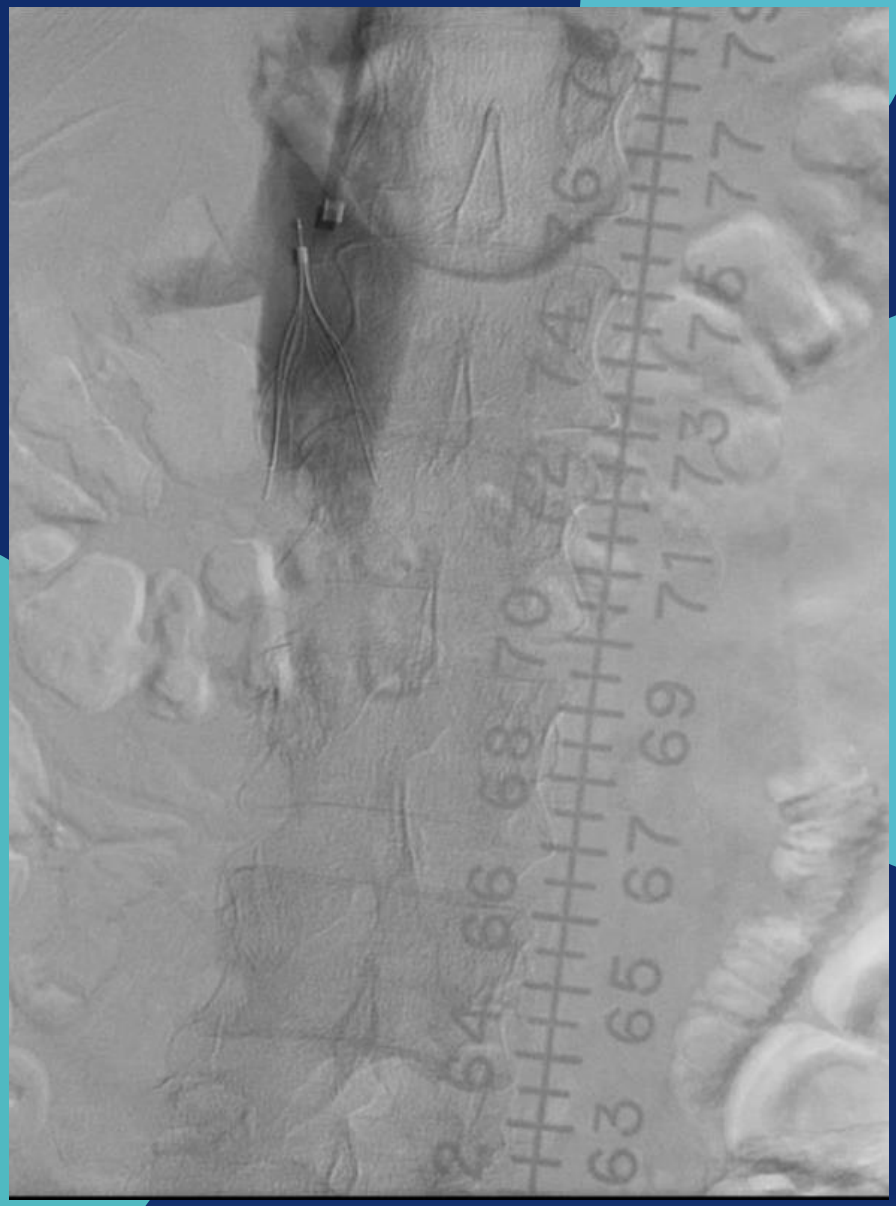
Case of the Day
March 2015

CASE COURTESY OF DRS. SUNDEEP TOOR AND KENNETH SNIDERMAN

Case

- 54-year old male presenting with lower GI hemorrhage and left leg DVT
  - Cook Celect IVC filter inserted

- Filter deployed without issue, no significant tilt



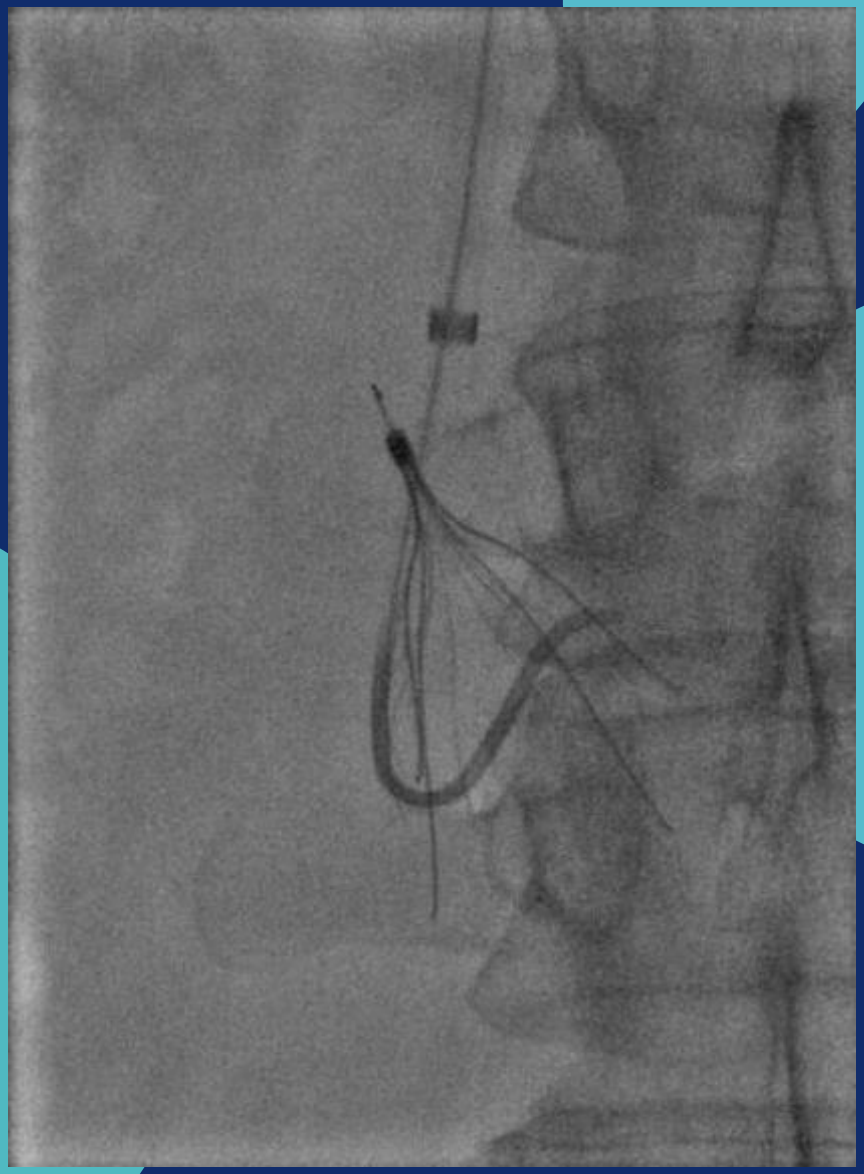
- Retrieval requested approximately 1 month later

- Filter now significantly tilted
- Initial attempt at retrieval using standard techniques unsuccessful

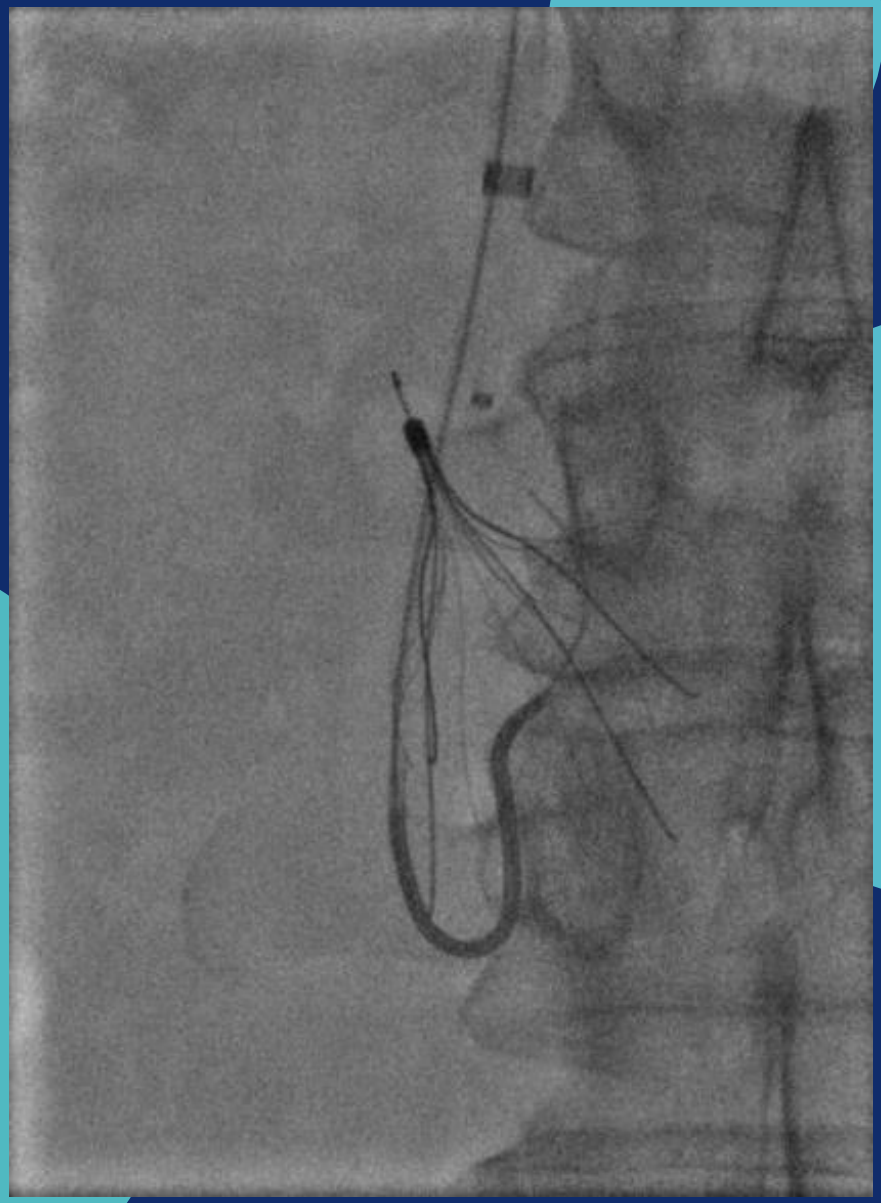
- Angioplasty balloon used to displace filter apex away from the IVC wall without success

- 11-French sheath inserted
- 260 cm long 0.035” Glidewire advanced past the filter, between filter and IVC wall

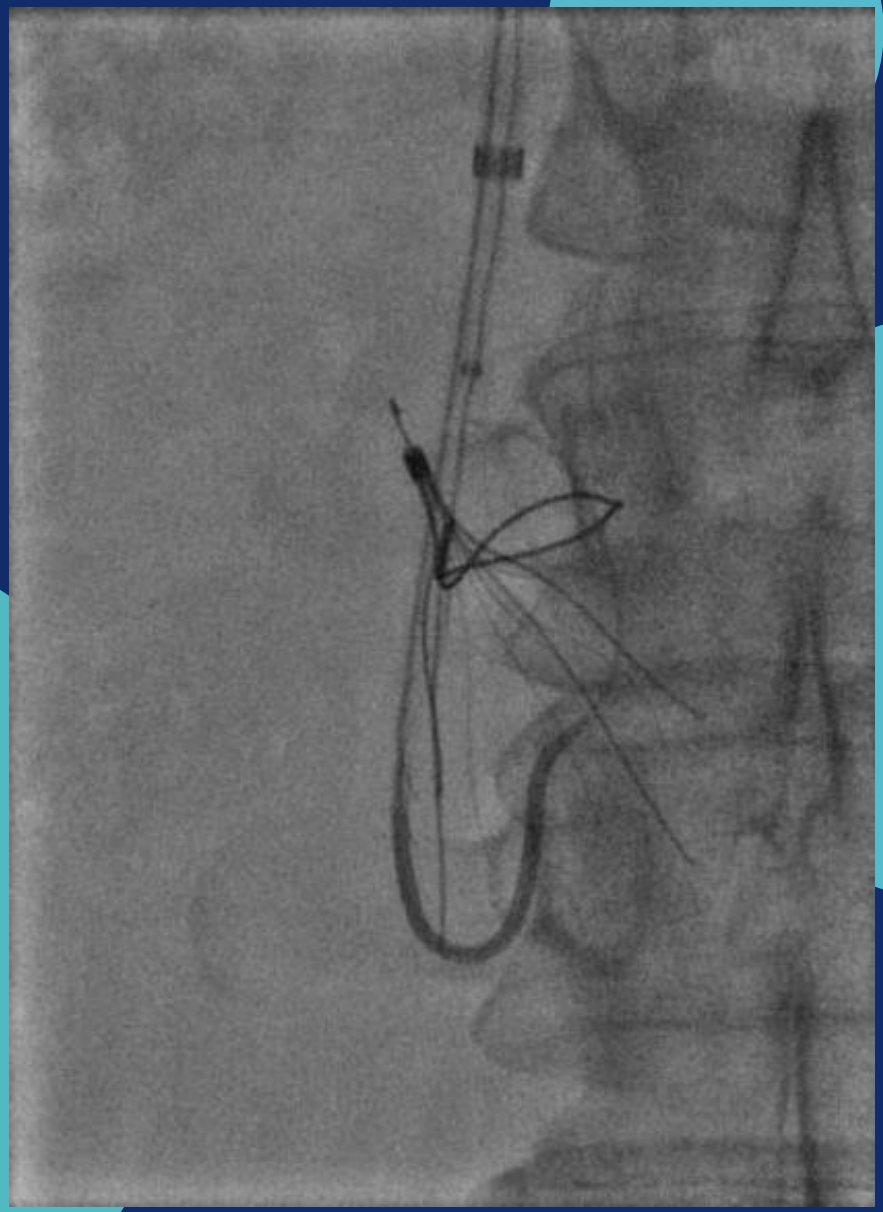
- Reverse curve (SOS) catheter inserted such that it hooks around the filter



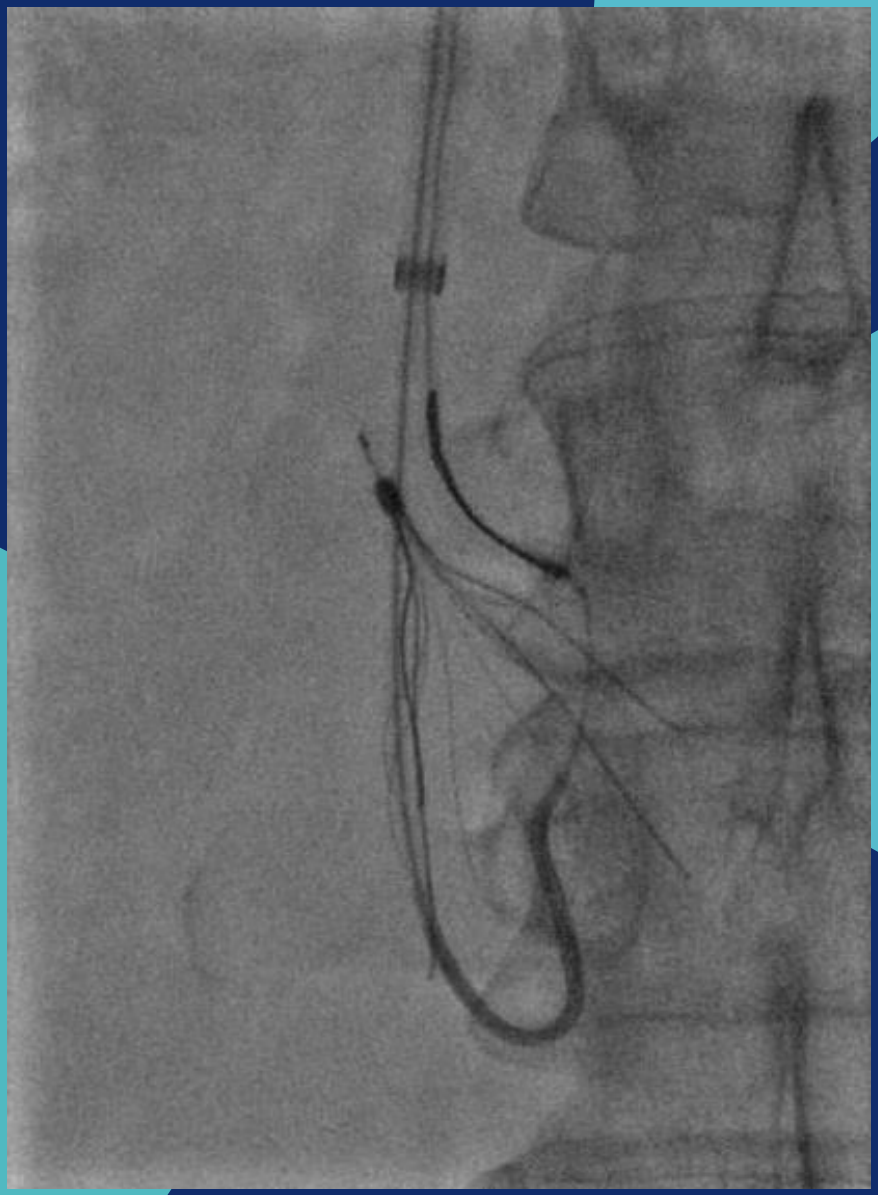
- Glidewire now directed in retrograde direction toward the sheath



- Para-axial 15mm gooseneck snare introduced through the same sheath and used to the grasp the wire

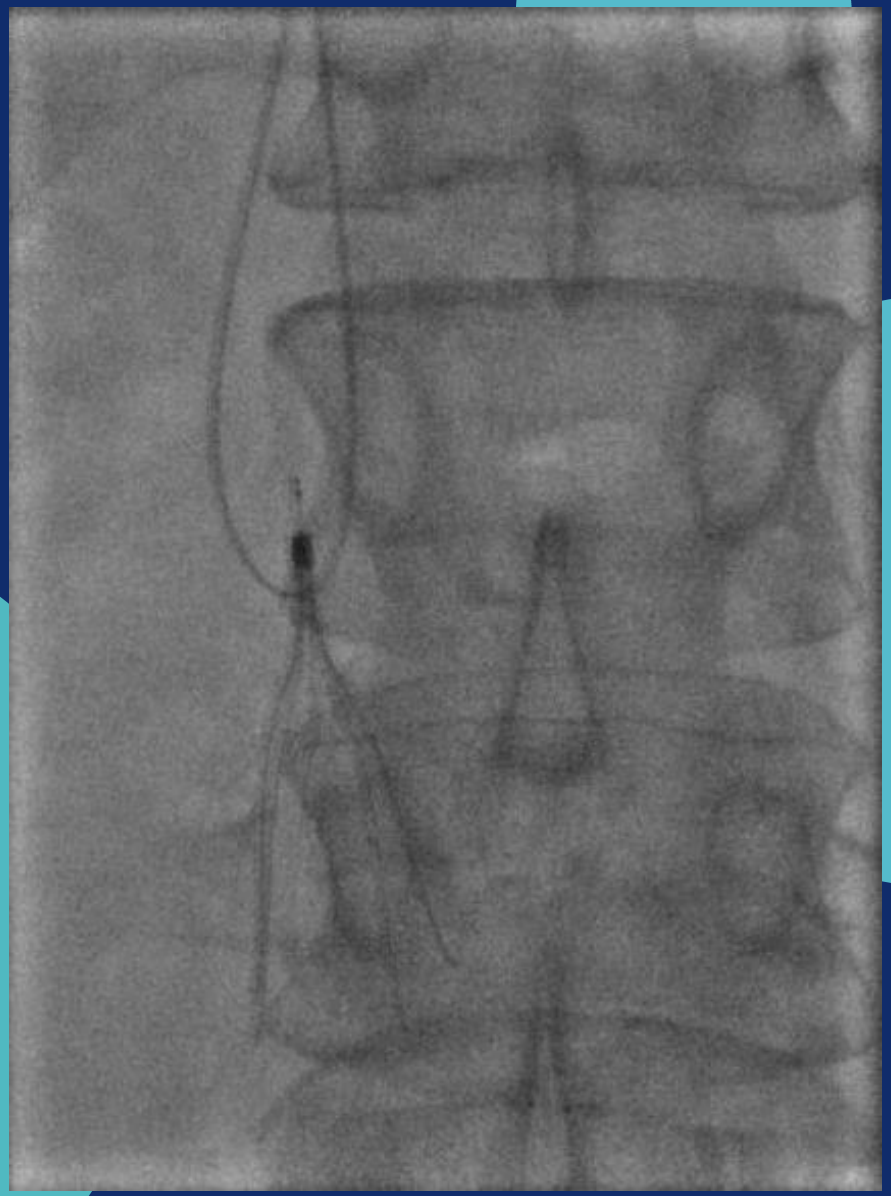


- Catheter and snared wire pulled up into the sheath

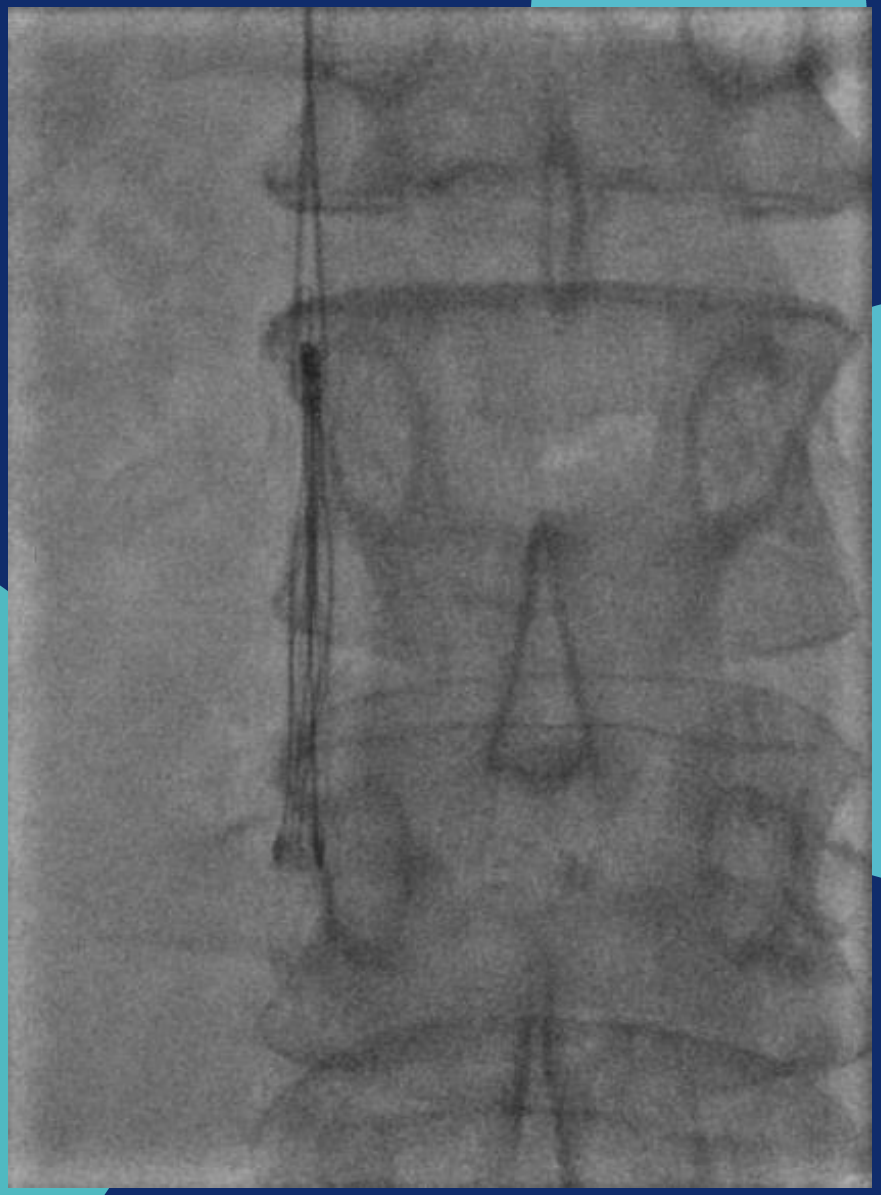


- Catheter and snared wire pulled up into the sheath

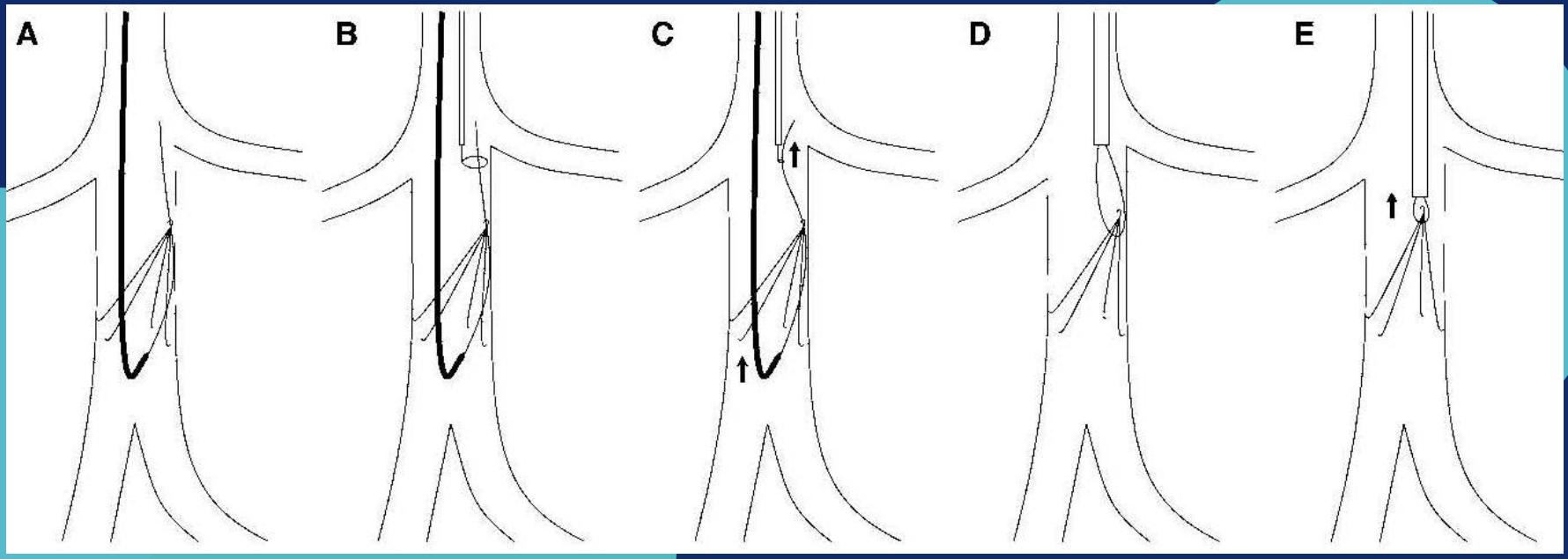
- Both ends of the wire now externalized forming firm sling to apply traction straightening the filter



- Sheath advanced to the filter apex while applying traction to both ends of the wire allowing the filter to be captured



Loop-Snare (Sling) Technique



*Iliescu et al. Cardiovasc Intervent Radiol 2012; 35:741-750

- Rubenstein et al. (JVIR 2007) – Successful in 8 of 8 patients
  - Technique used summarized in this diagram

IVC Filters

- IVC filter insertions have more than doubled in the past decade
- Filters provide benefit in decreasing pulmonary embolism but likely provide no long-term survival benefit
- Estimated 25% of retrievable filters cannot be removed using standard techniques
- Most common reason for difficulty with retrieval is tilting, others reasons include incorporation into IVC wall, penetration, fracture, migration

IVC Filters

- US FDA in 2010 recommended removal of retrievable IVC filters as soon as protection from PE no longer needed
- Complications of long-term IVC filters
  - Caval thrombosis
  - Penetration of adjacent vessels
  - Penetration of adjacent viscera
  - Device fracture
  - Migration or embolization

Filter Retrieval

- Reported retrieval rates significantly vary from 1 to 40% in various studies
- Should be a greater emphasis on IR taking a role in recalling patients for removal
- Prolonged dwell times are likely associated with decreased retrieval success rate
  - reported retrieval of a filter 3006 days post insertion

Complex Filter Retrieval Methods

- Directional catheter with snare
- Stiff wire-displacement
- Through-and-through “flossing” approach with dual access from femoral and jugular veins
- Balloon displacement
- Loop-Snare Sling technique
- Rigid bronchoscopy forceps
- Endovascular laser, thermal dissection

References

- Rubenstein et al. J Vasc Interv Radiol 2007; 18:1315-1318
- Kuo et al. J Vasc Interv Radiol 2013; 24:622-630
- Iliescu et al. Cardiovasc Intervent Radiol 2012; 35:741-750
- Lynch. J Vasc Interv Radiol 2011; 22:337-340