

Central vein occlusions: recanalization and treatment

Charles Y. Kim MD, FSIR

Division Chief, Vascular & Interventional Radiology

Associate Professor of Radiology

Duke University Medical Center

Disclosures

- Consultant : Medtronic, BTG, Galvani

Central vein occlusions

- Recanalization critical for
 - HD catheters
 - AV access
- No recanalization = no HD
- No HD = nonsurvival
- Failure is not an option!

Clinic

- Obtain and review imaging with patient
- Set expectations
- Assess GA vs sedation
- Confirm goals
 - Catheter for HD
 - Catheter for HeRO
 - Which arm
 - Relieve swelling
 - Angioplasty / stenting
 - HeRO as backup?

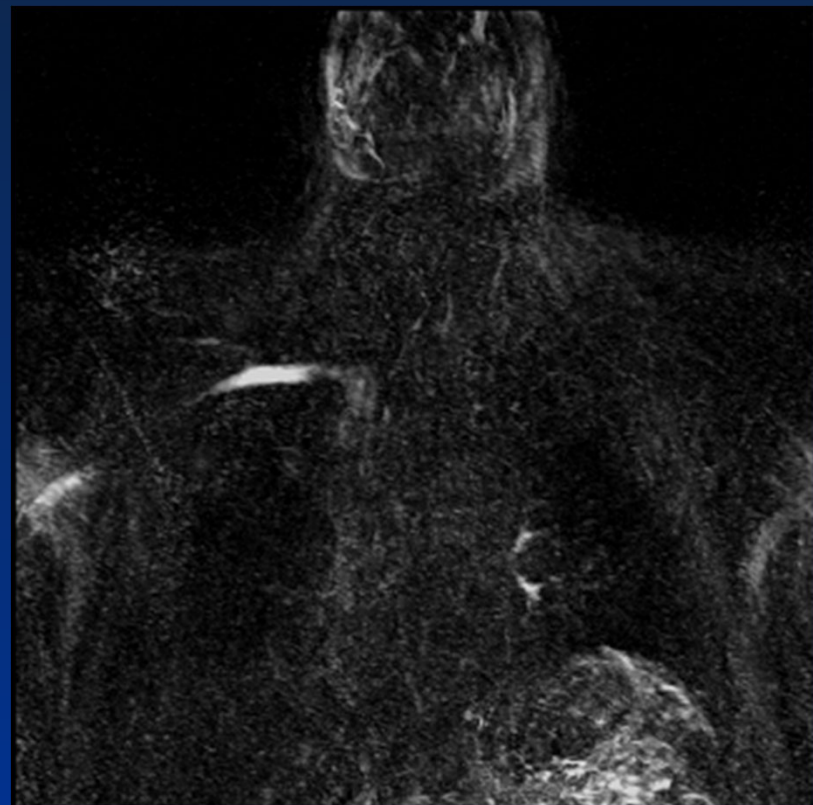
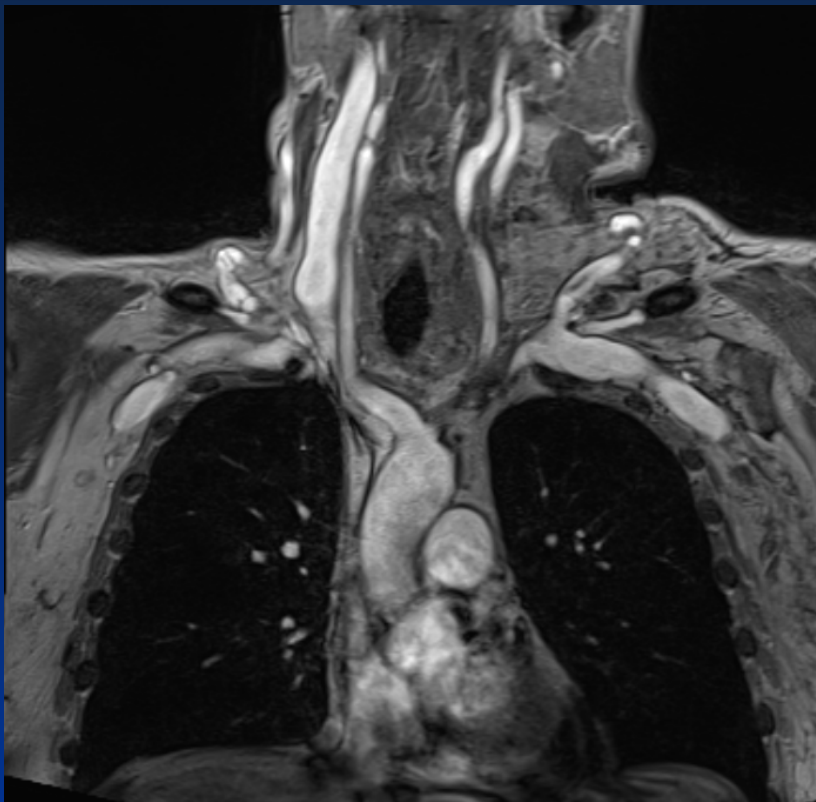
CT venography



MR venography

- Feraheme = no NSF

Time-resolved imaging

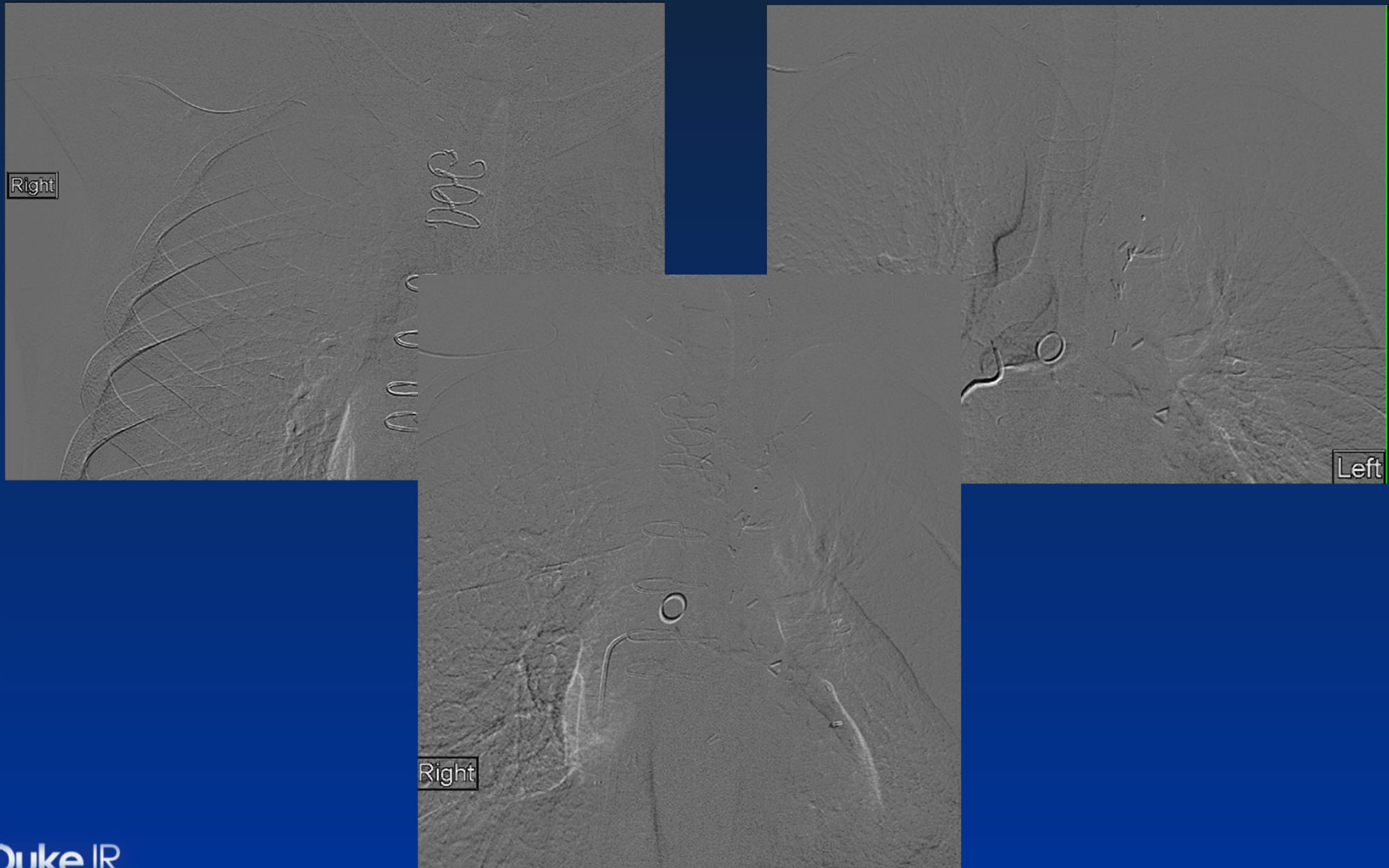


“Blunt” recanalization

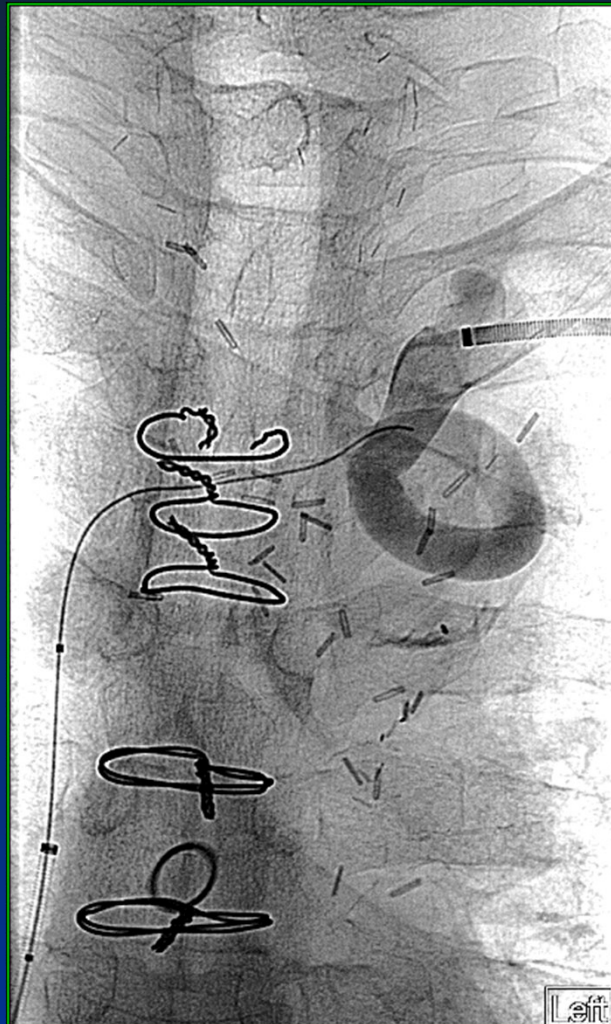
- **Stiff guidewire / angled catheter**
- Feel / look for beak – cement
- Support sheath
- Low-profile tapered crossing catheters
- Try both sides of occlusion
- Through-and-through access / snare



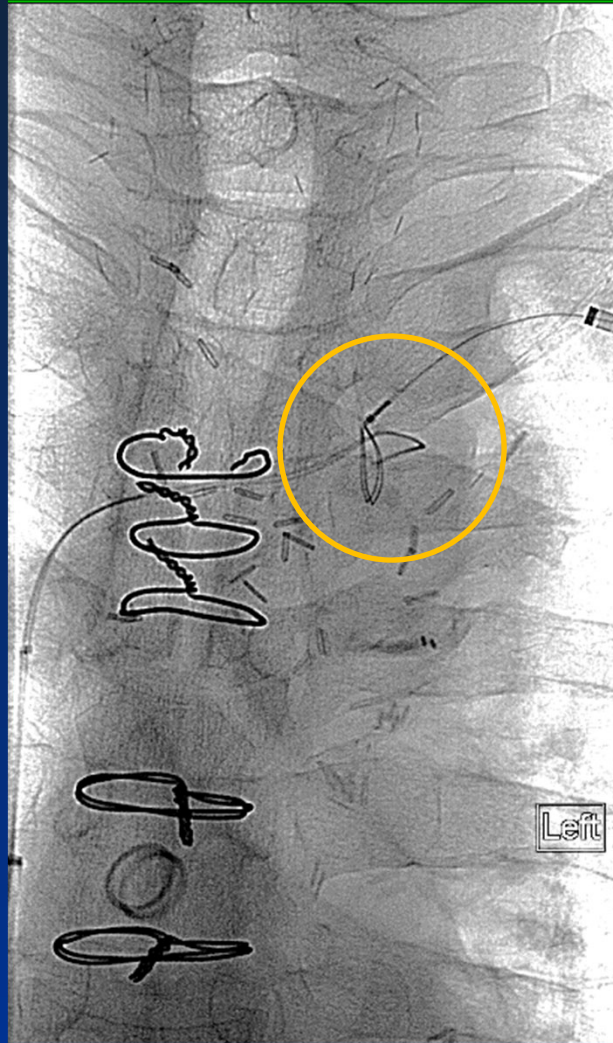
Blunt recanalization example



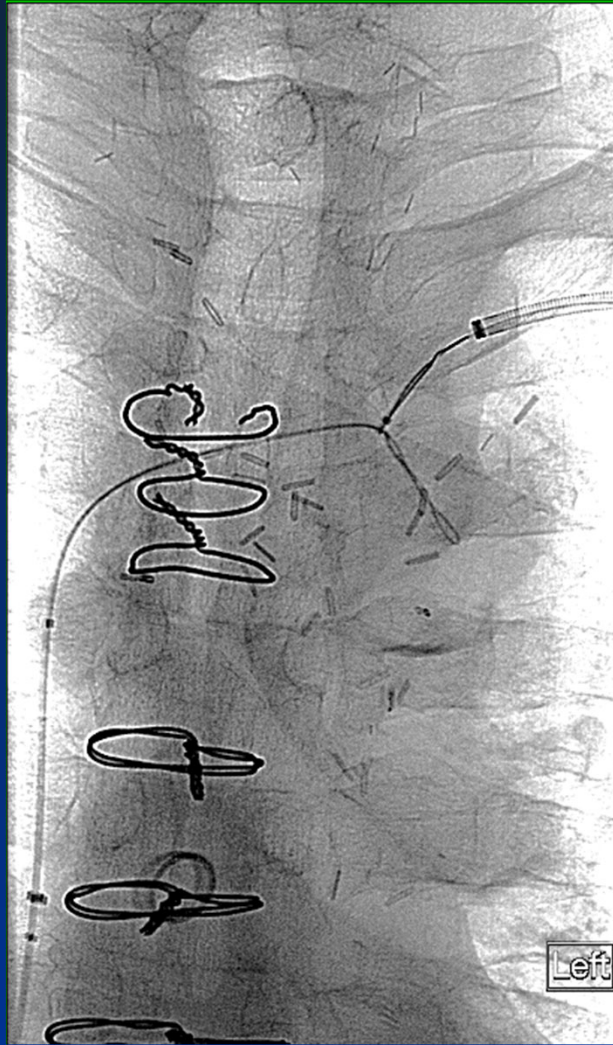
Blunt recanalization example



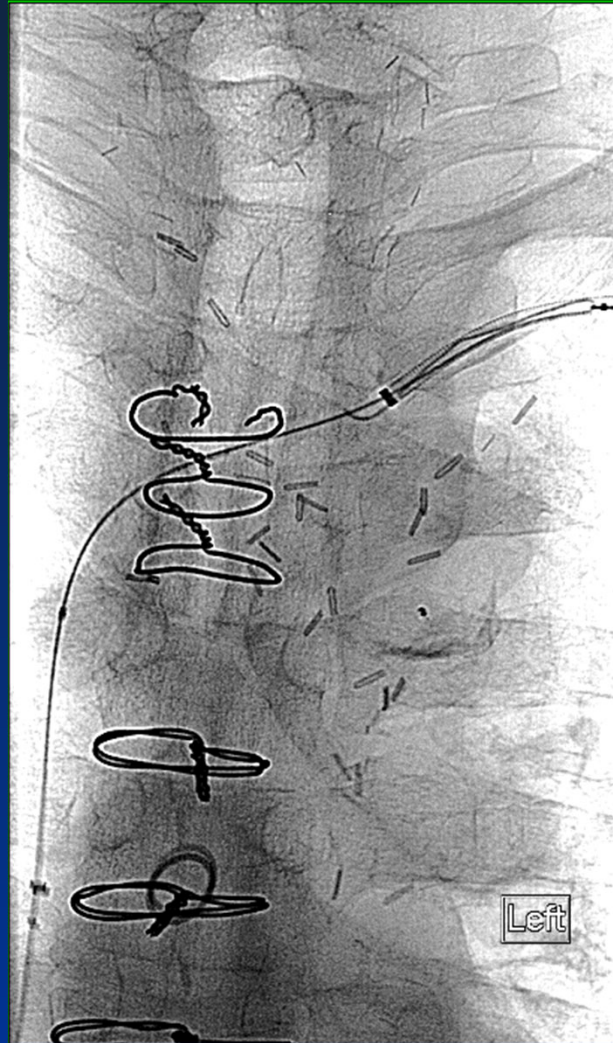
Blunt recanalization example



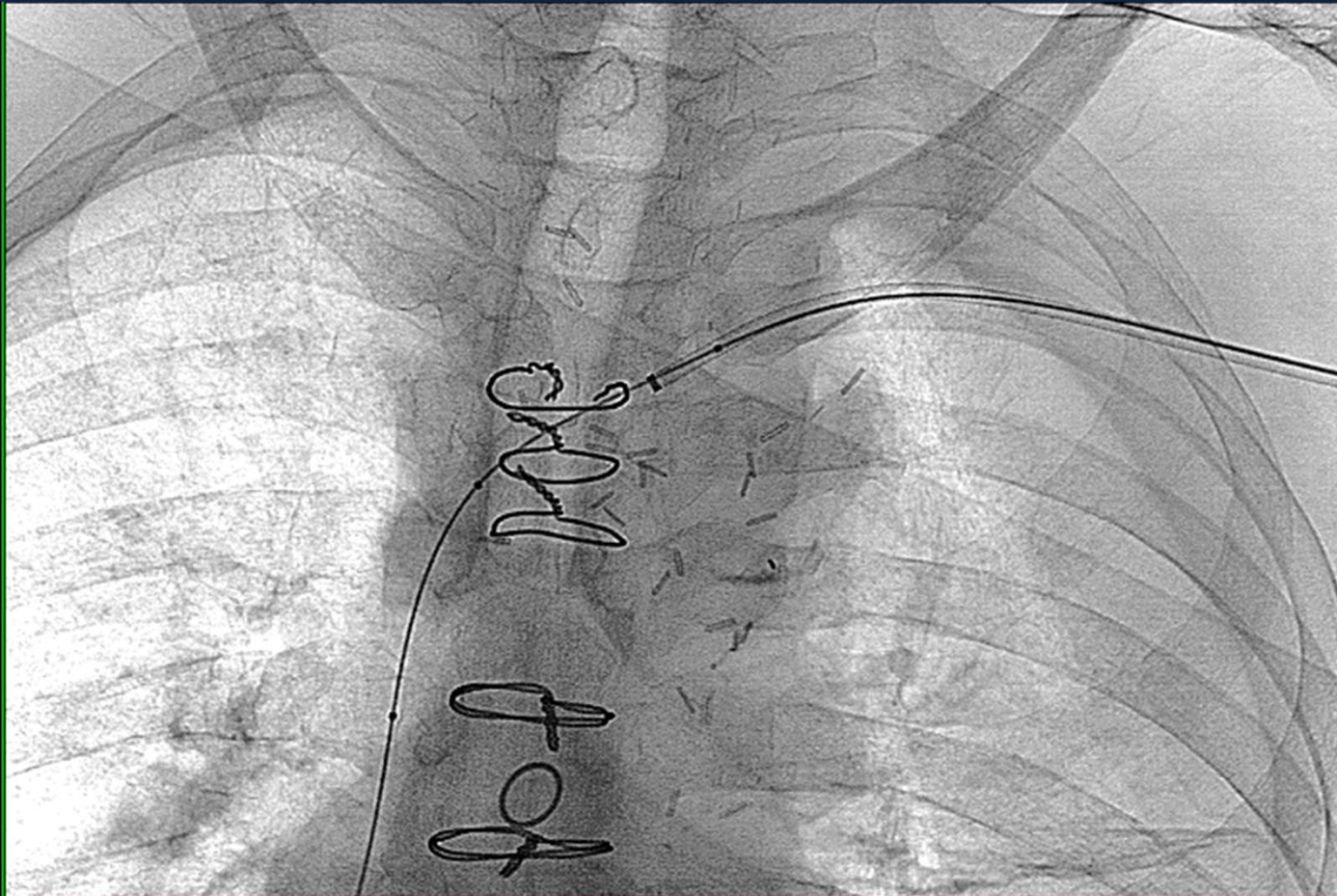
Blunt recanalization example



Blunt recanalization example

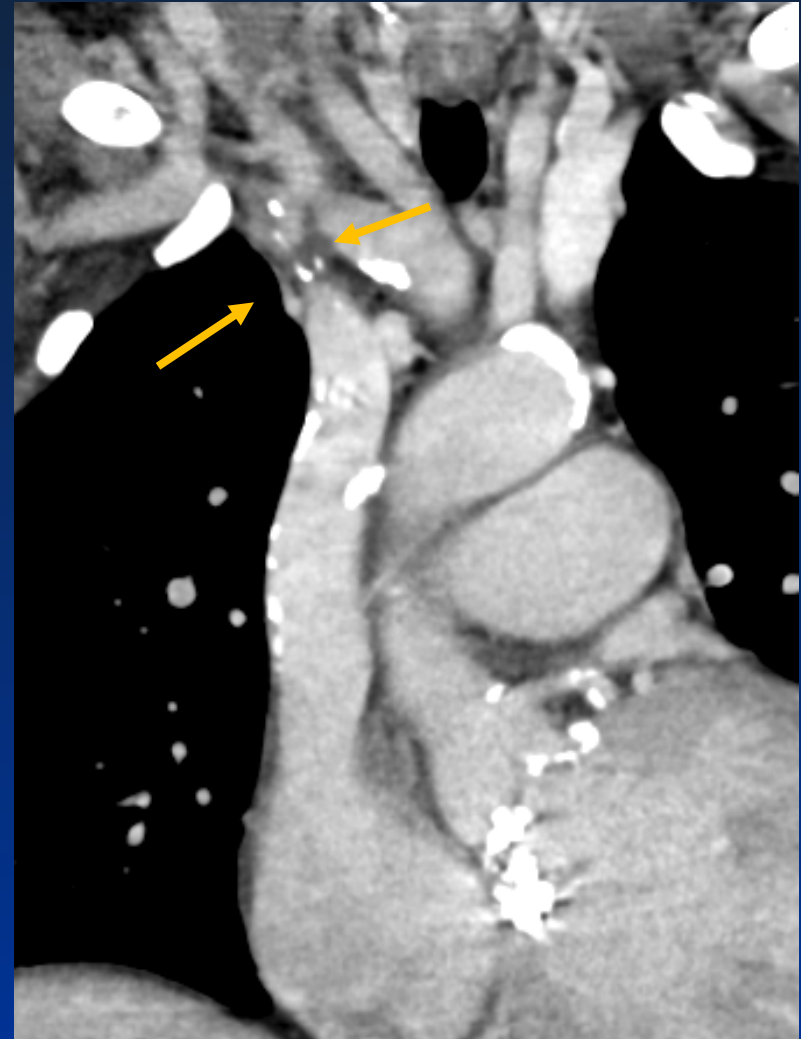


Blunt recanalization example



Sharp recanalization

- Ideal for
 - Rt BC/SVC
 - Straight vector
 - No intervening structures

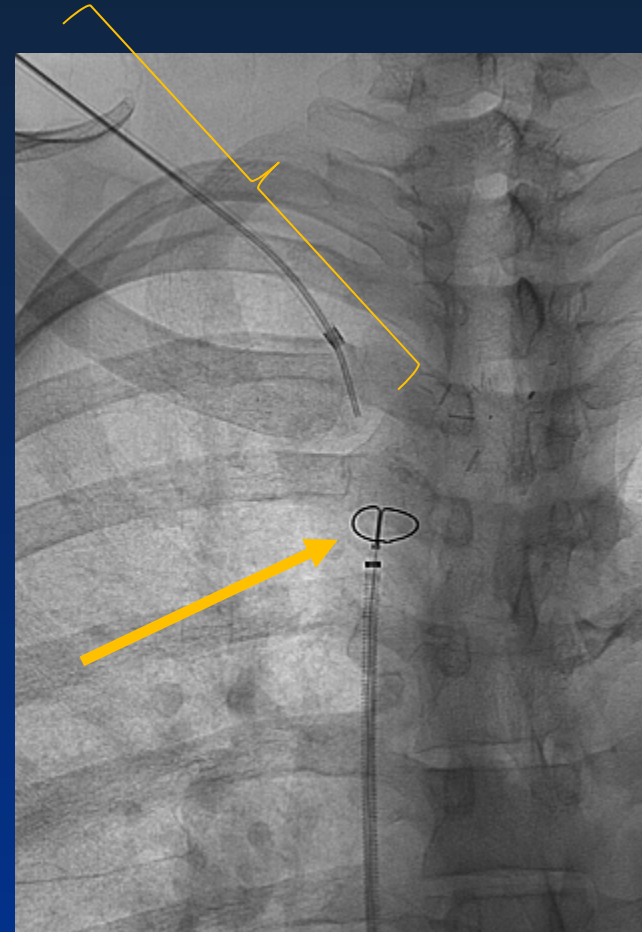


- Catheter access from above occlusion
- Catheter access below occlusion
 - CFV, translumbar, transhep

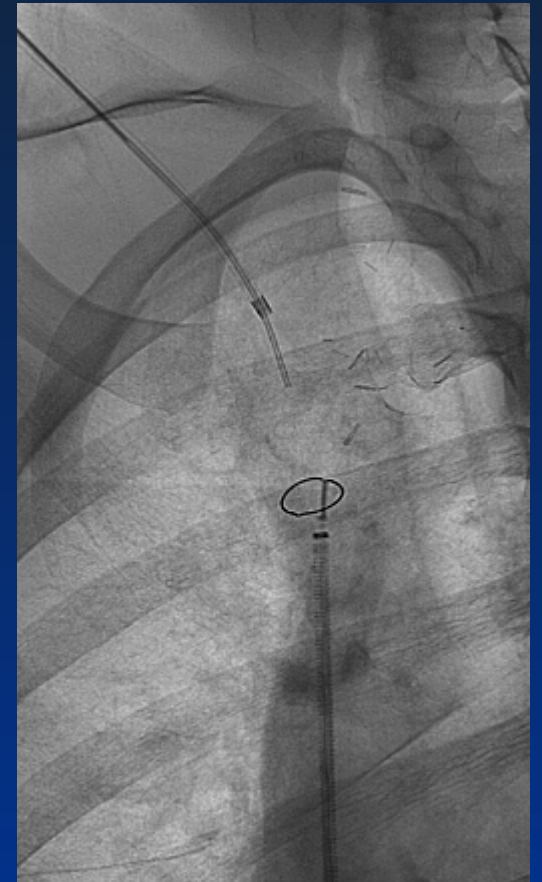
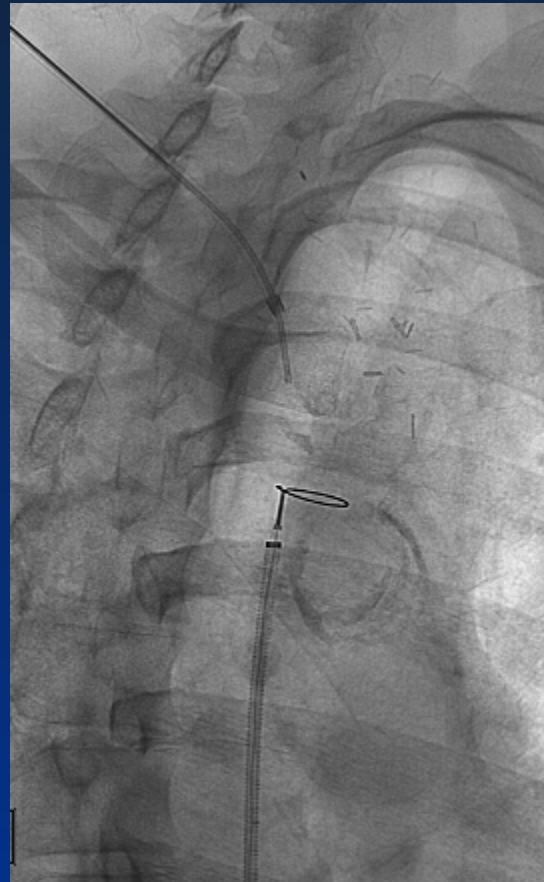
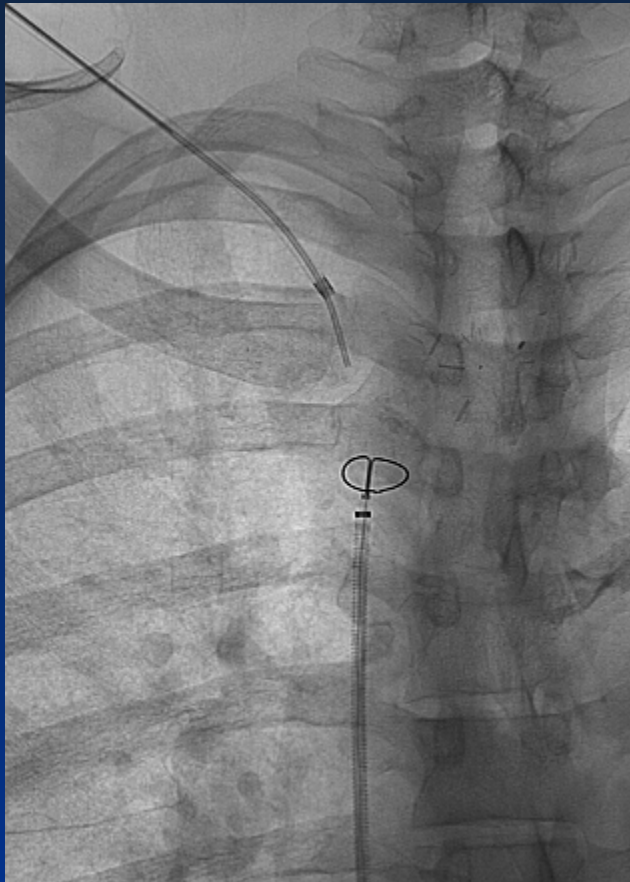


Angled cannula

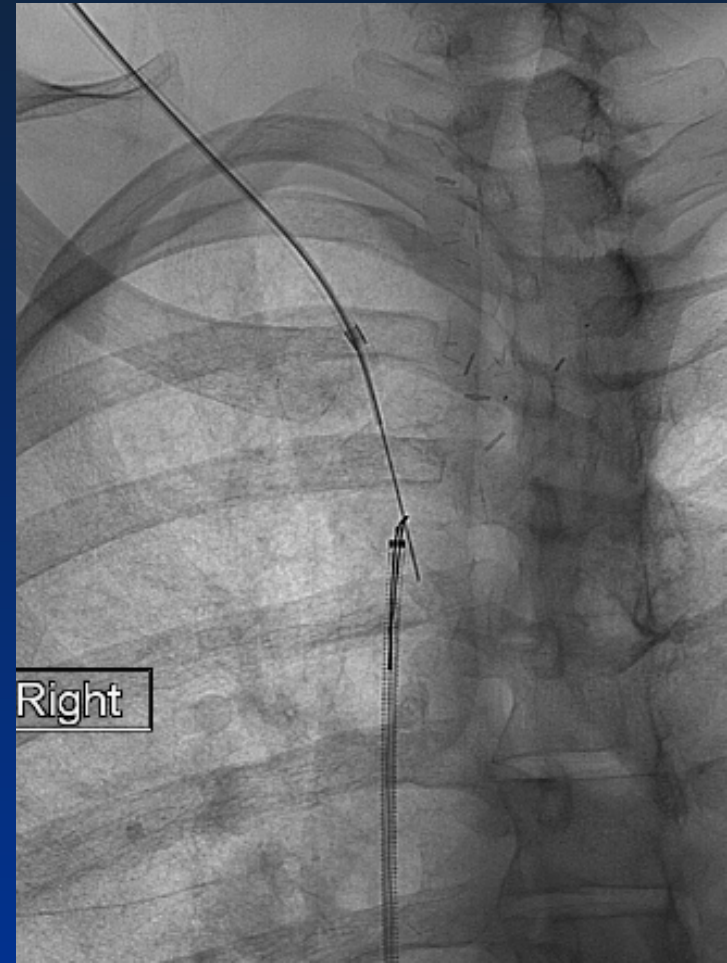
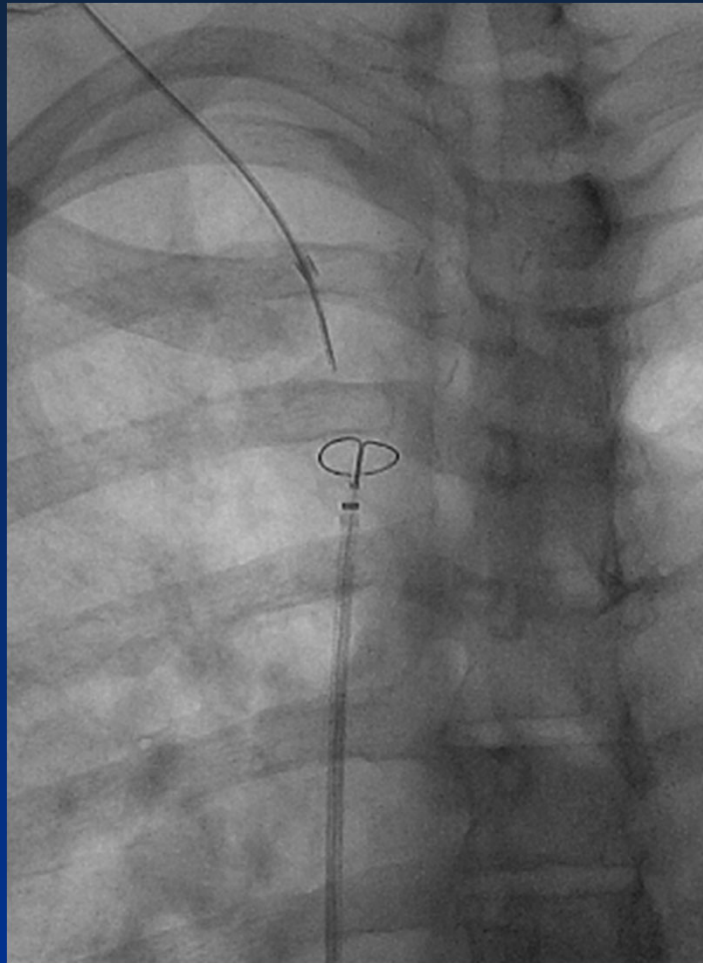
- 18 ga trocar needle with curved tip from above
- Snare from below

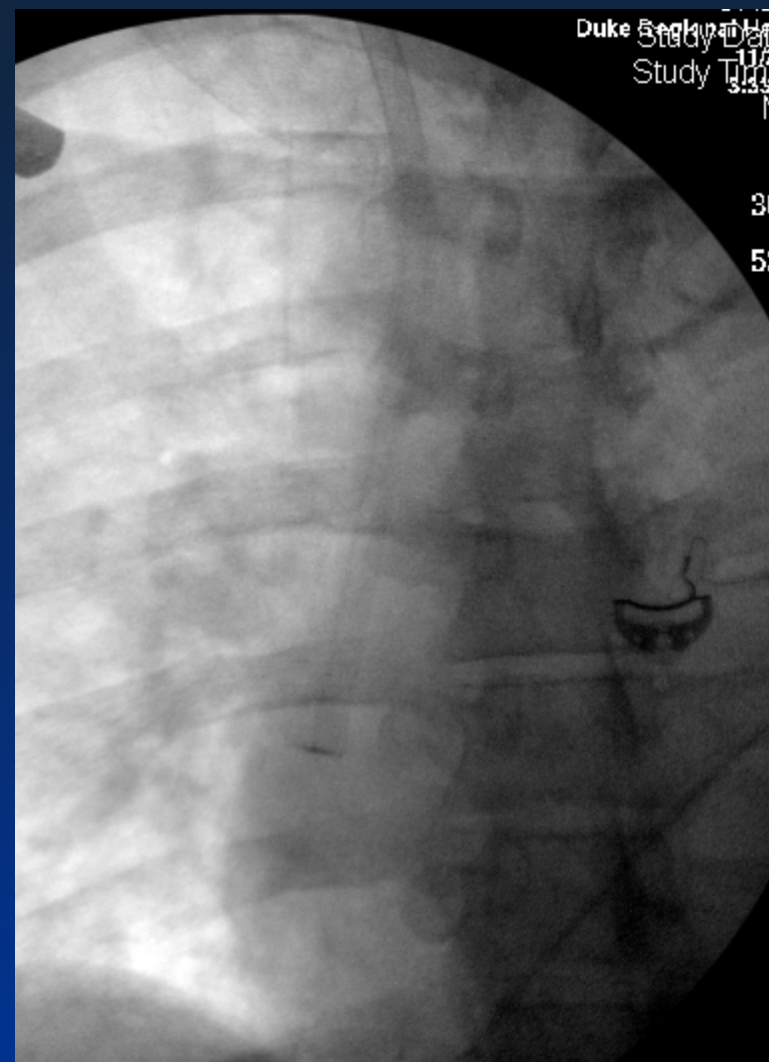
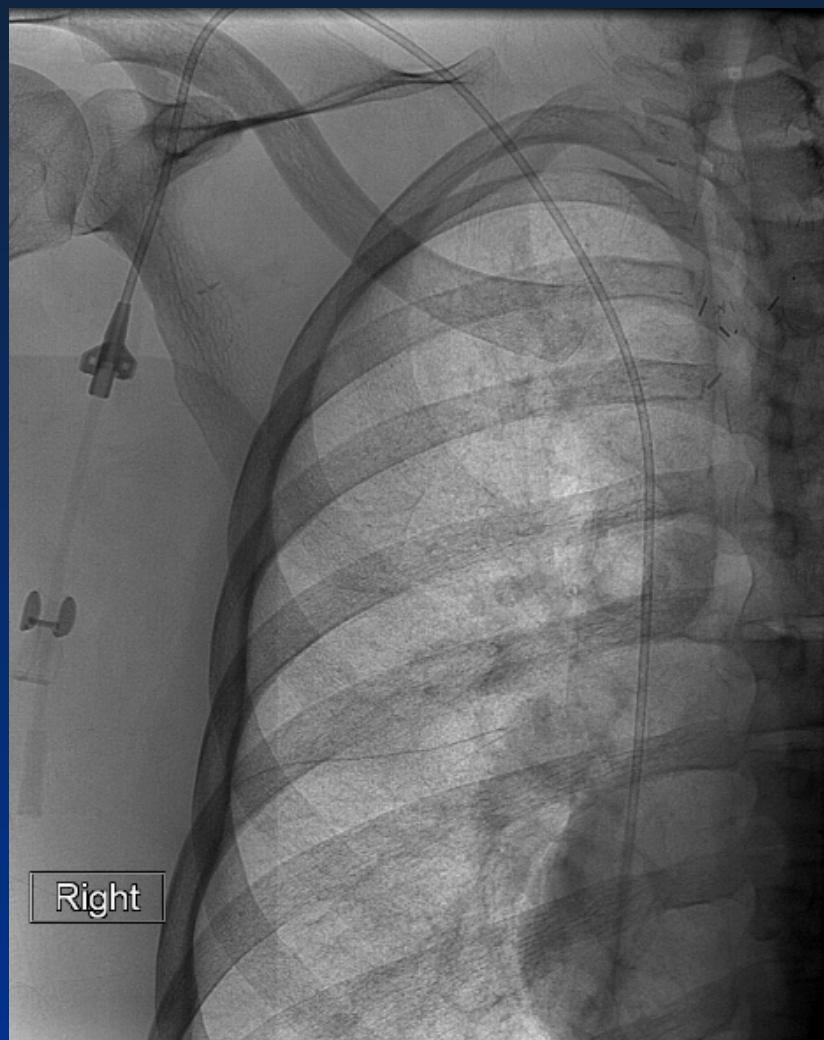


Fluoro triangulation



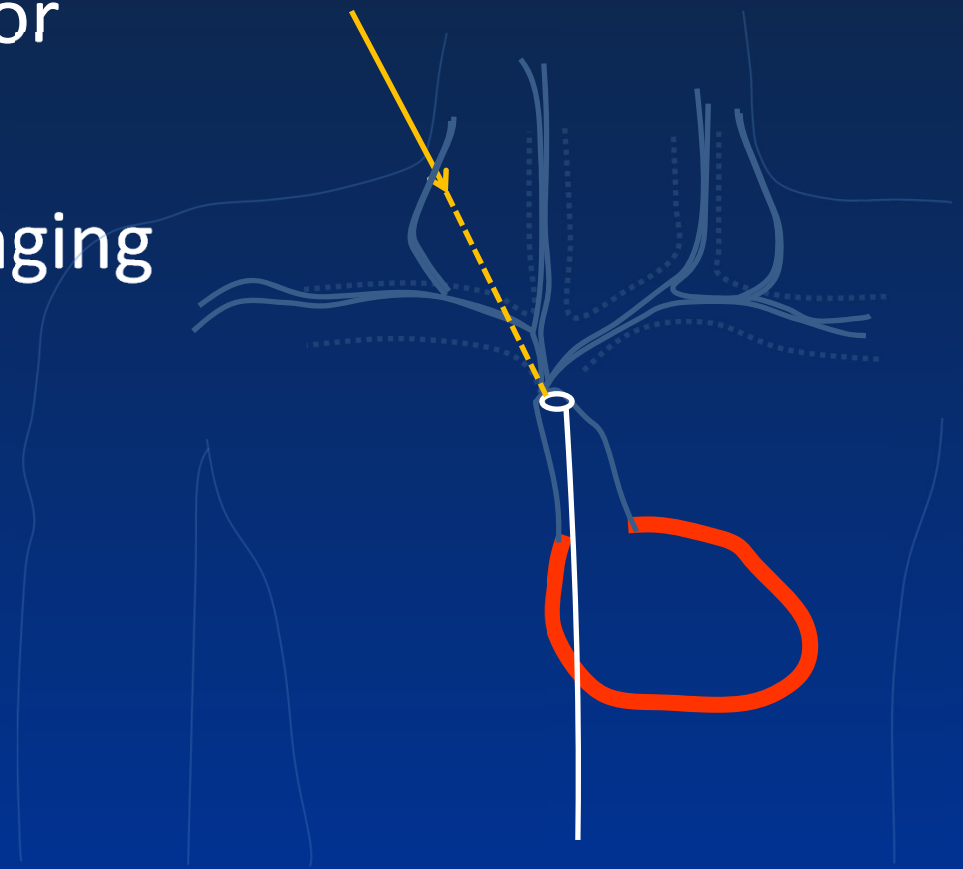
22 ga chiba needle



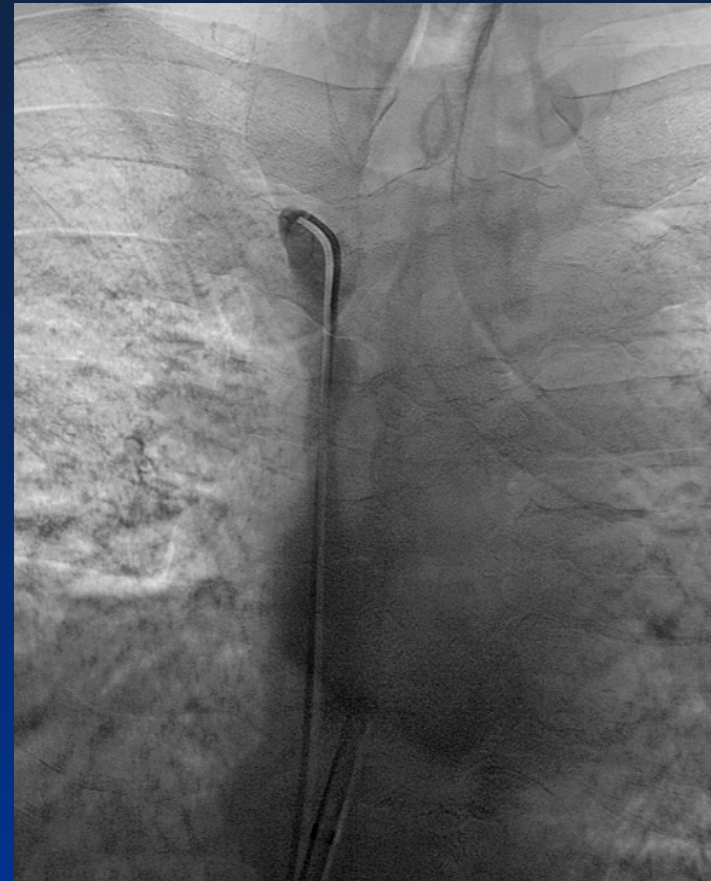
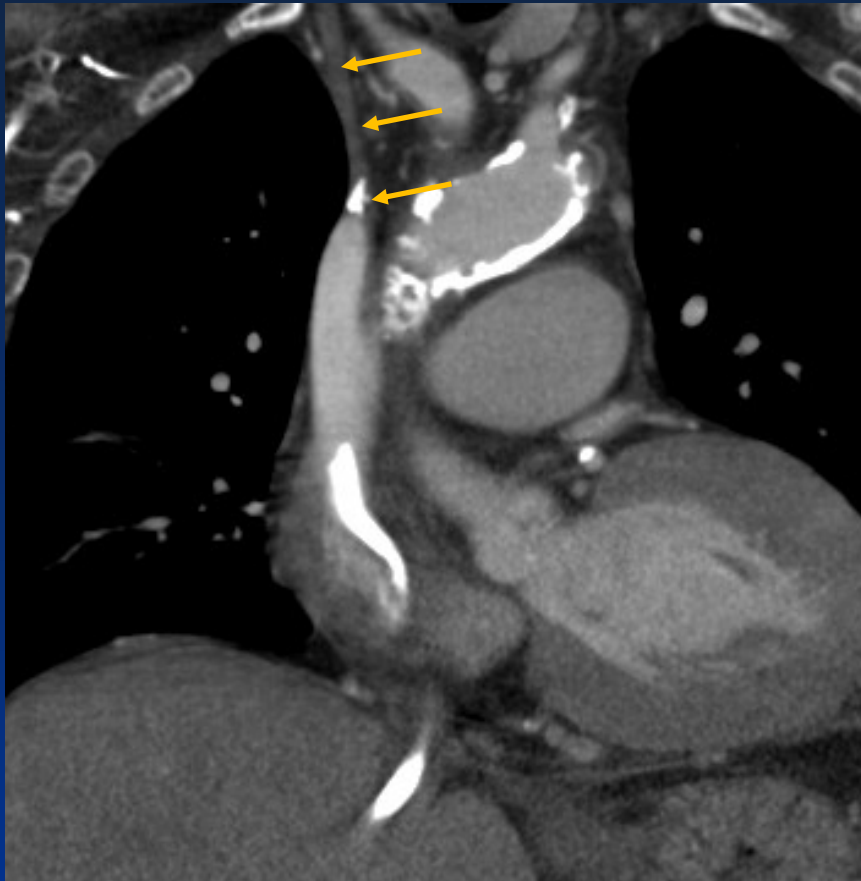


Percutaneous transmediastinal access

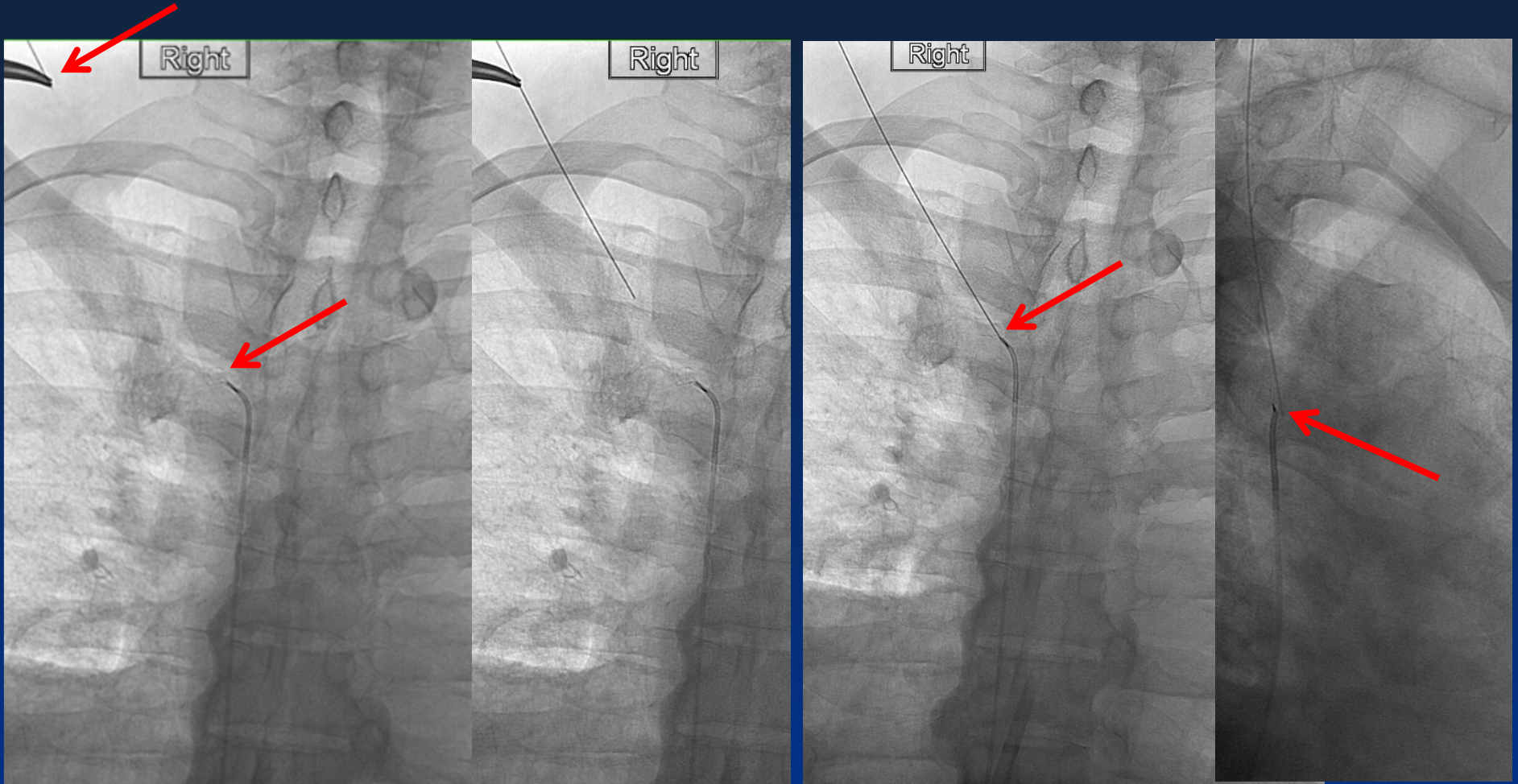
- Use when no supraclavicular vein for access
- **Pre-procedural imaging



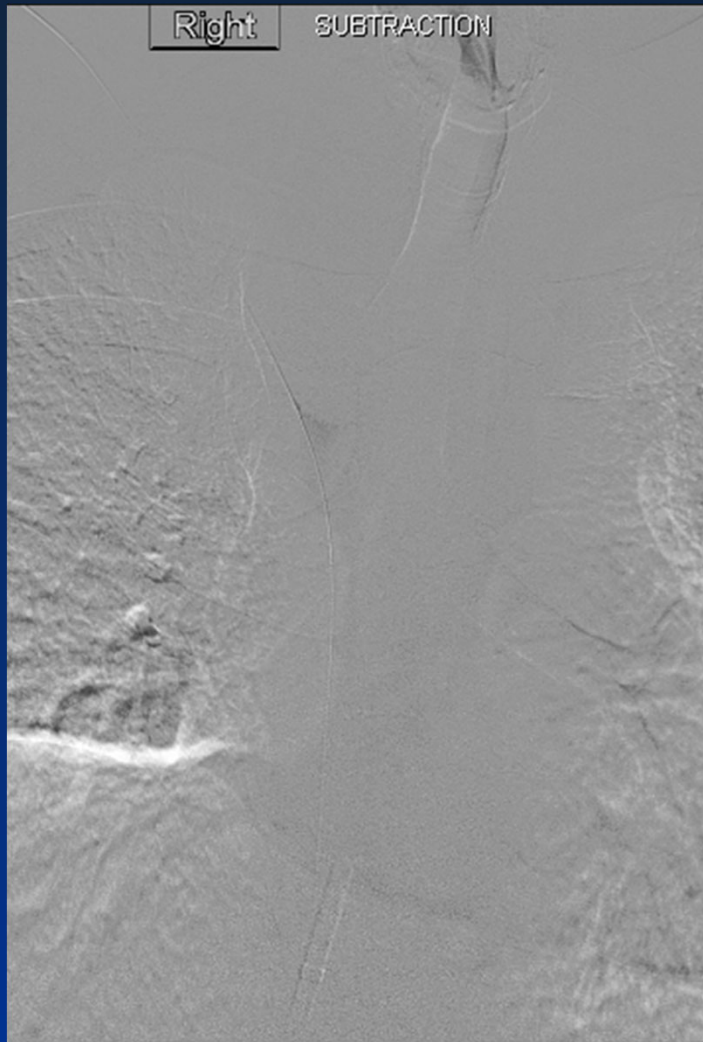
Everything above azygous is occluded



Fluoroscopic triangulation



DSA Tractogram



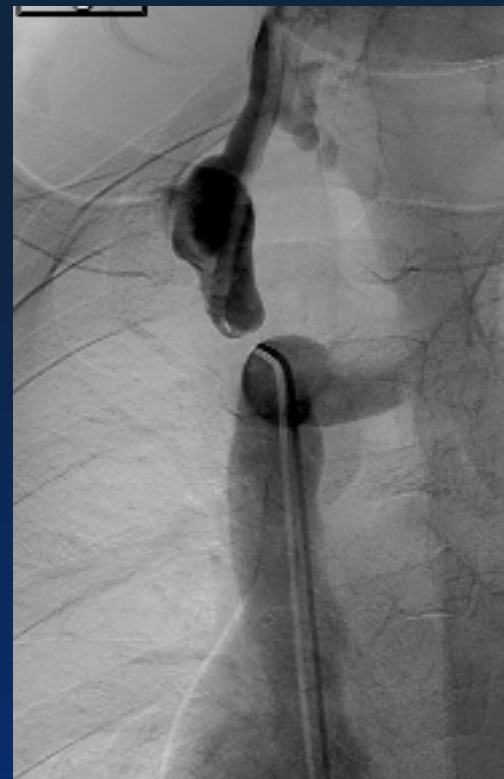
good



Bad (different patient)

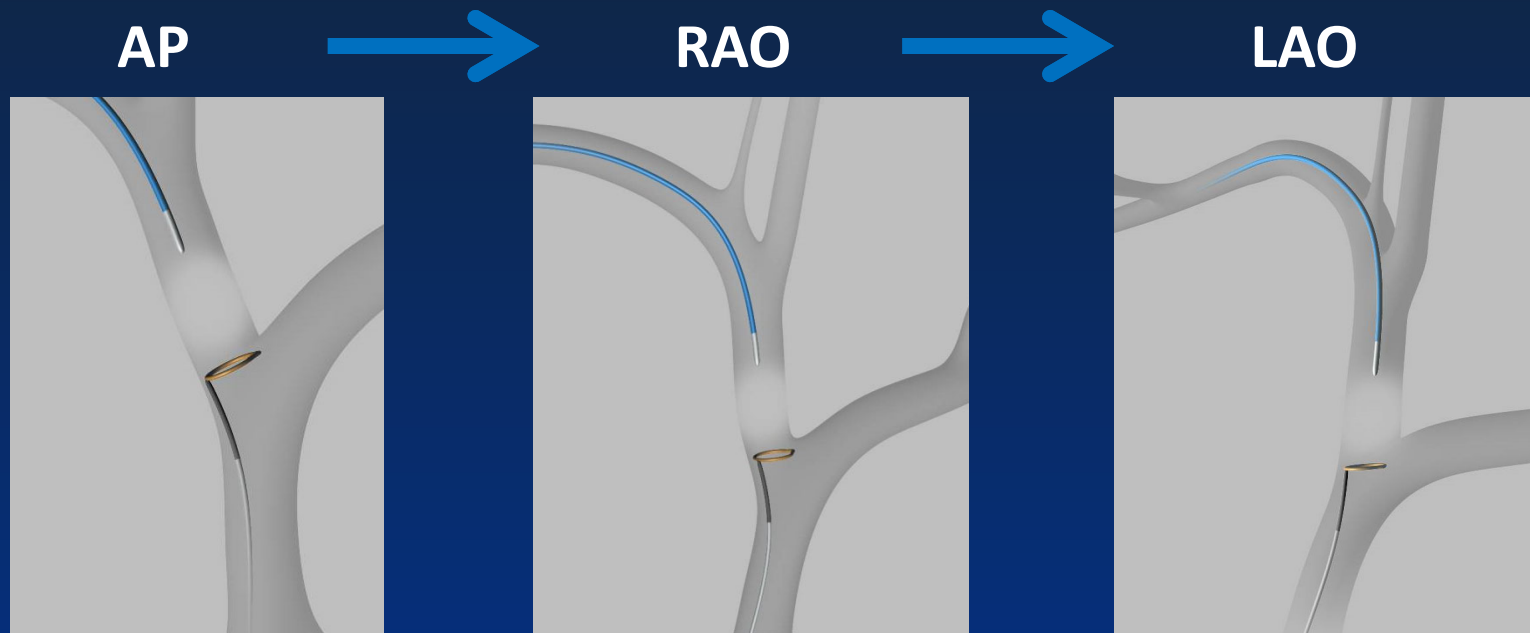
RF powerwire

- “cutting” RF energy at tip
- Ideal use: Short-segment occlusion
- allows more flexibility than needle



Conventional Technique

- fluoroscopic triangulation:

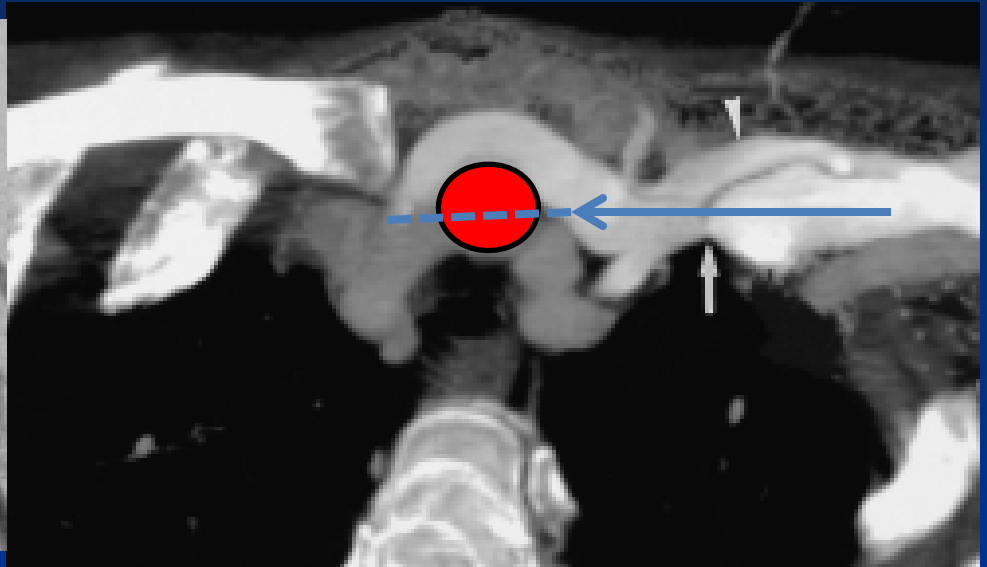
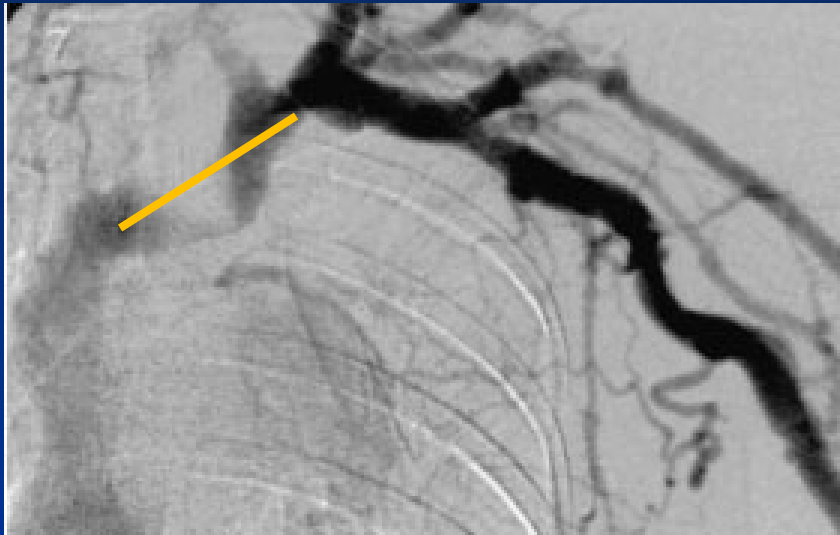


- Prior to and following *each* application of RF

Guimaraes et al. JVIR 2012; 23(8): 1016-21.

Longer segment occlusions

- Beware: Longer burn-path = $\uparrow$ nontarget entry
- Linear vector?
- *imaging critical to assess candidacy



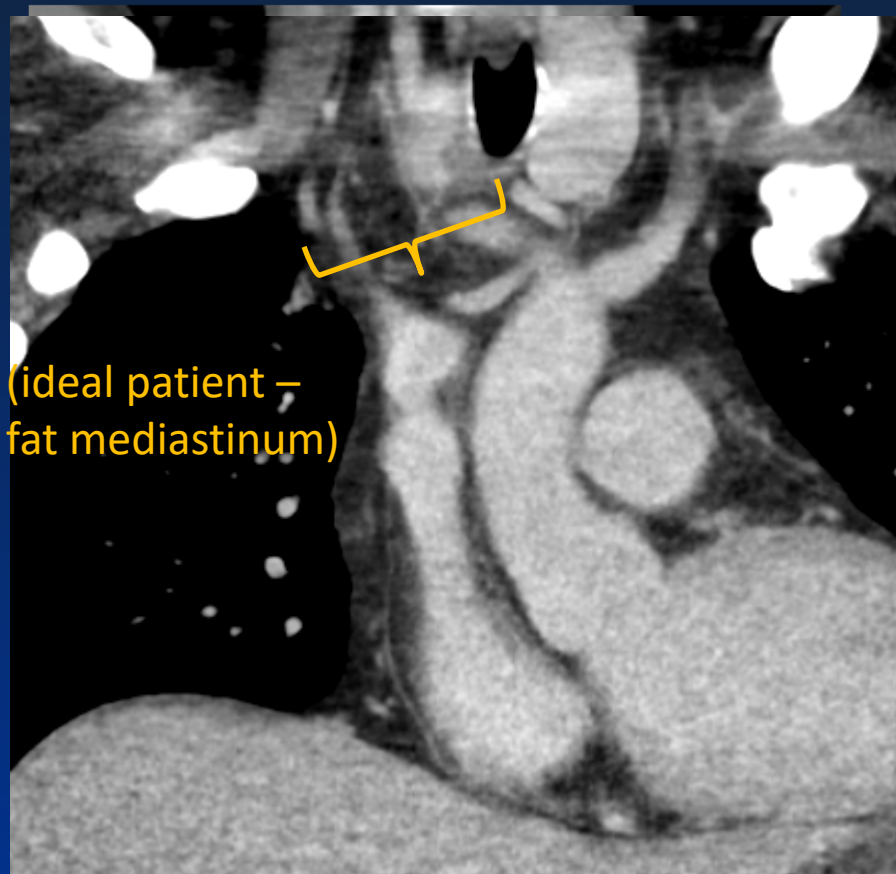
RF Powerwire: minimum use

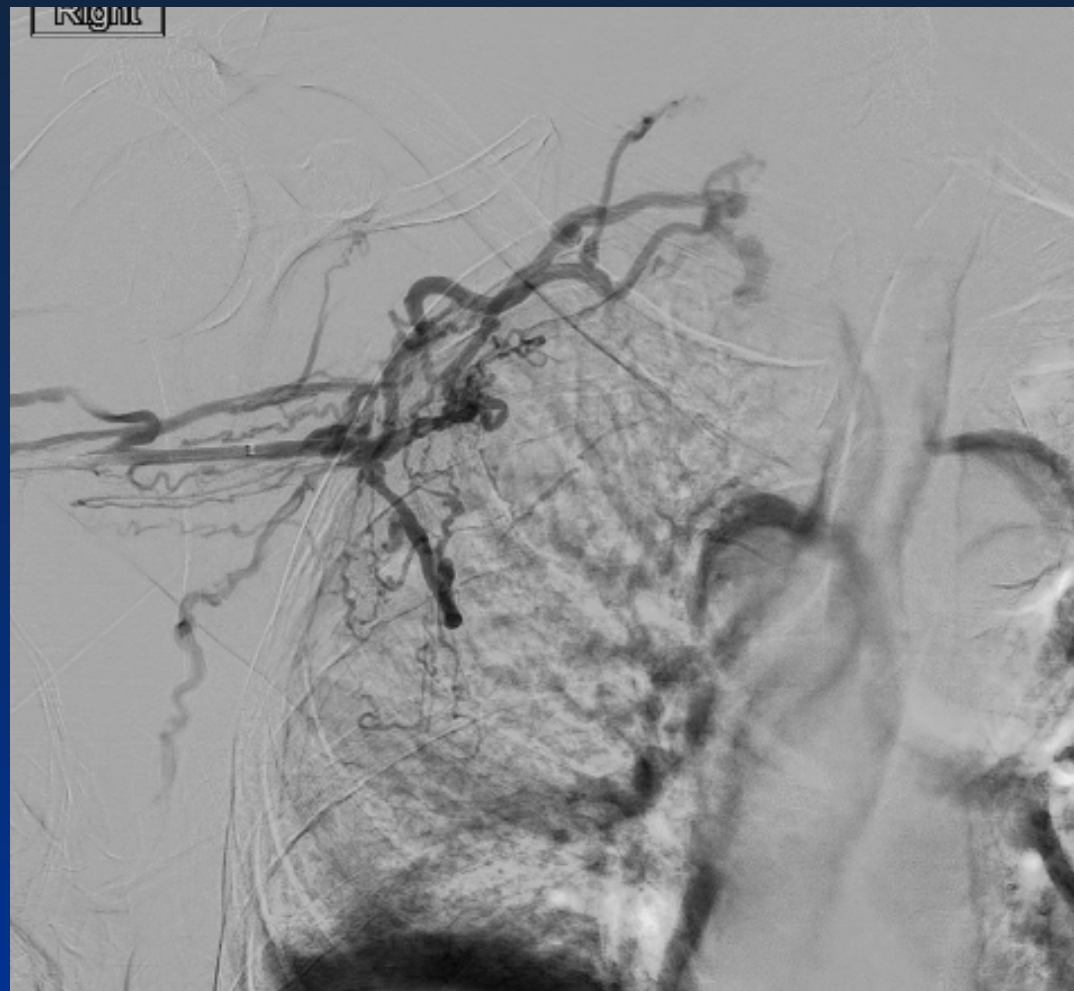


Transmediastinal dissection

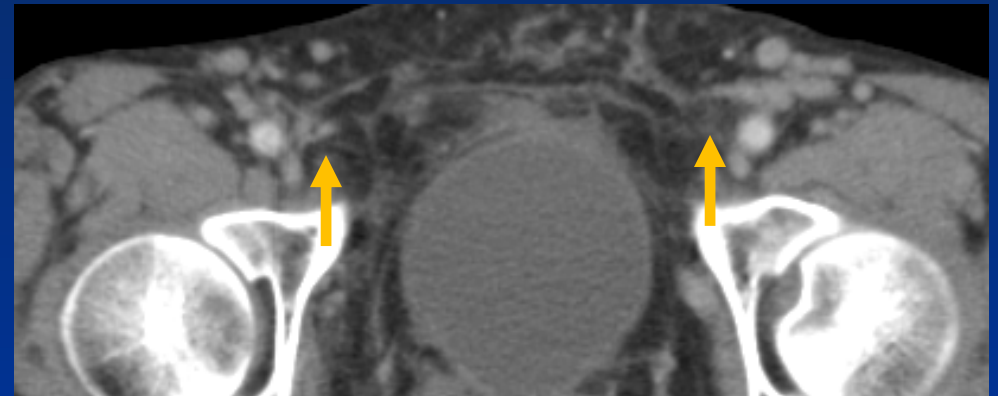
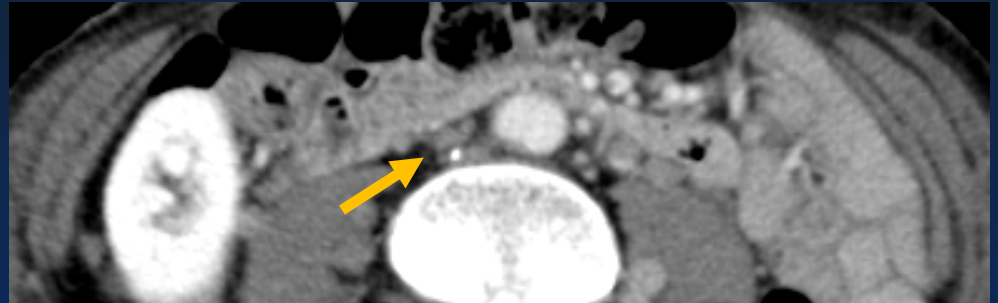
- When all else has failed or not feasible/safe
- Enter paravascular mediastinal fat
- Dissect guidewire along fat plane until near point of re-entry
- Use powerwire to re-enter vein
- Mediastinal fat is SAFE!

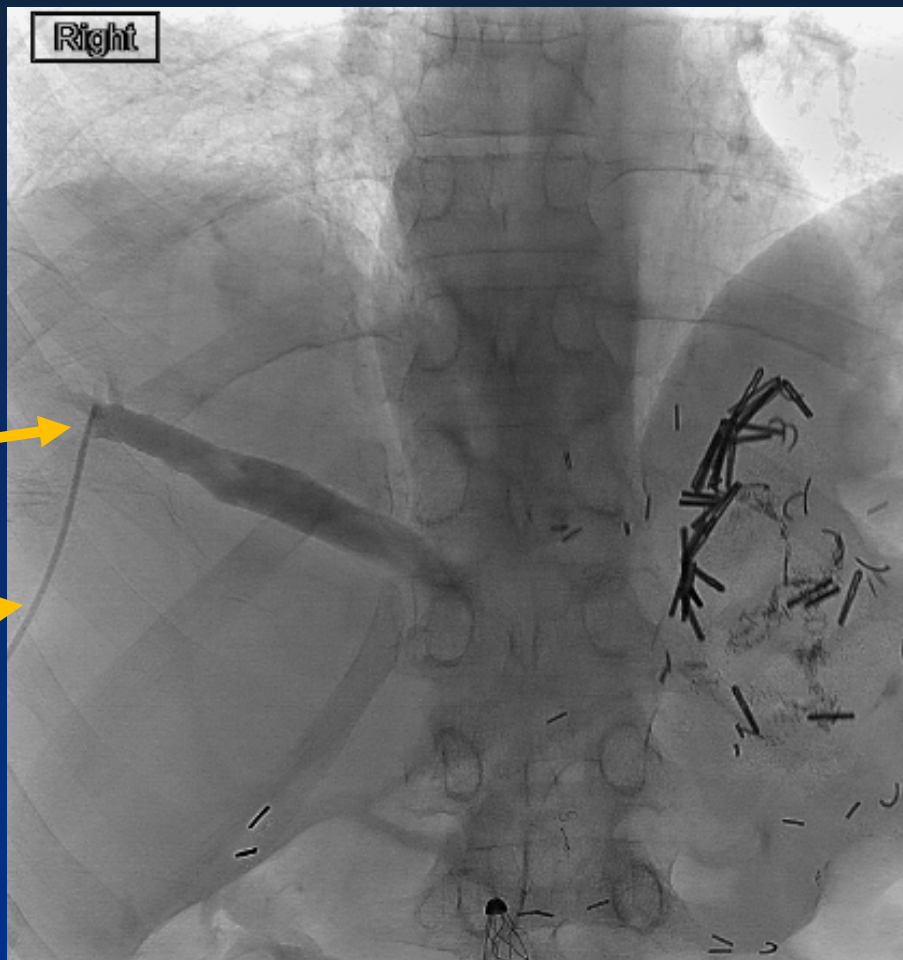




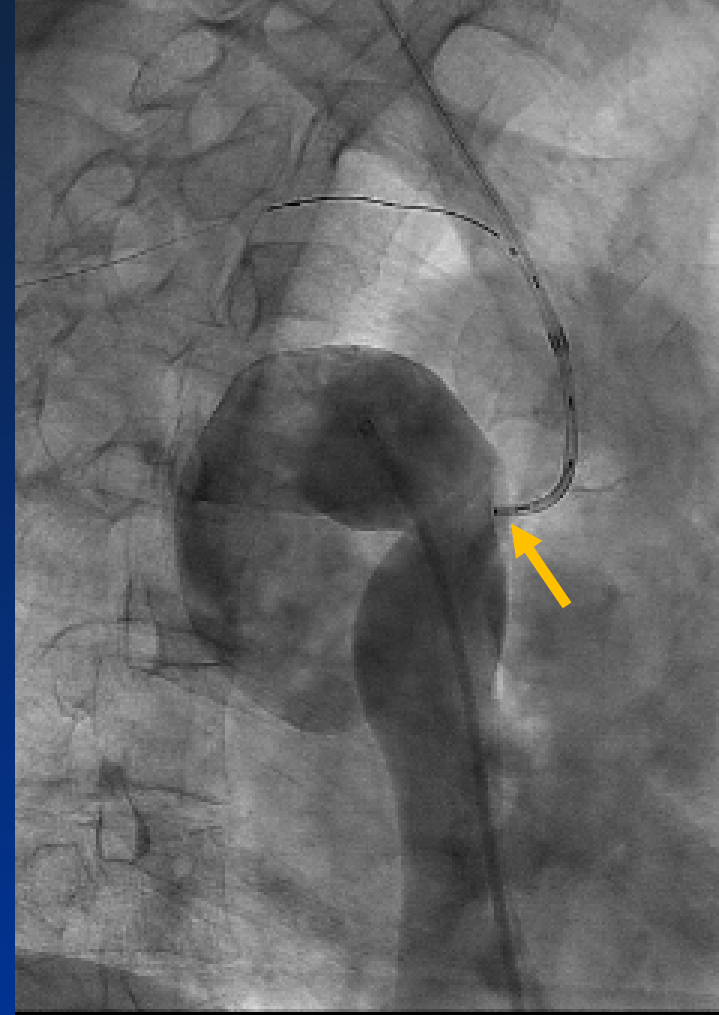
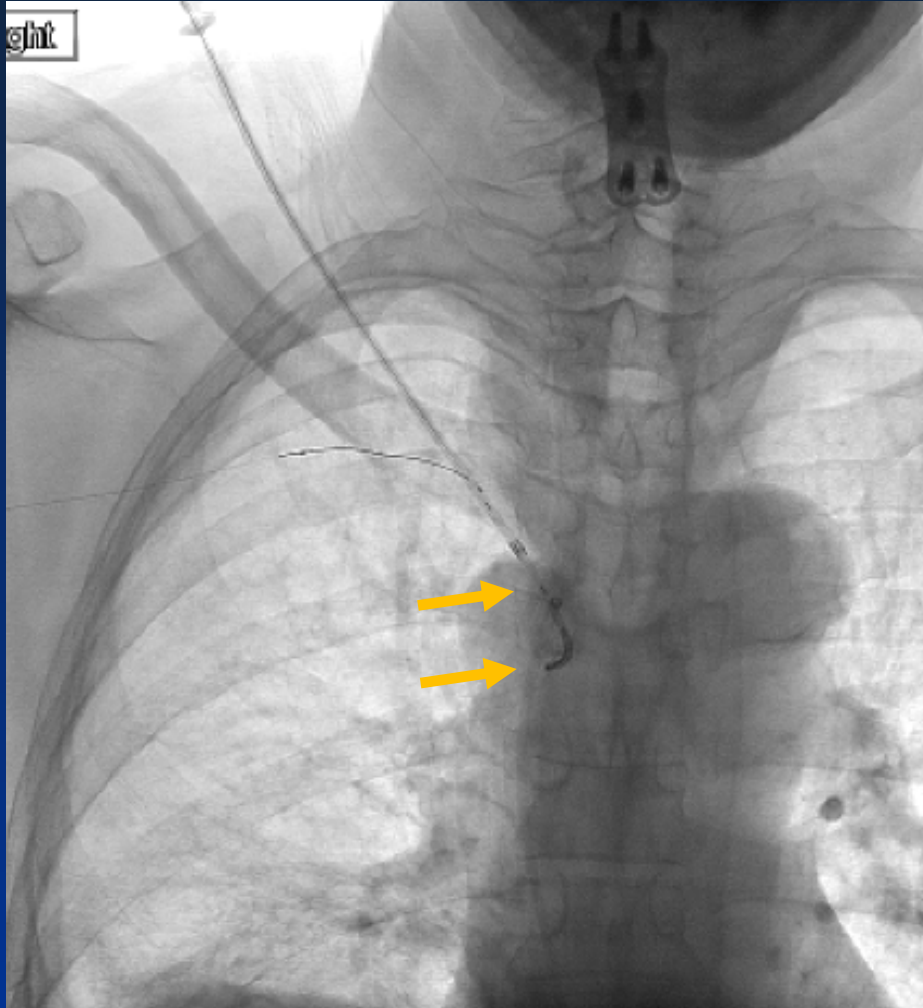


IVC occluded

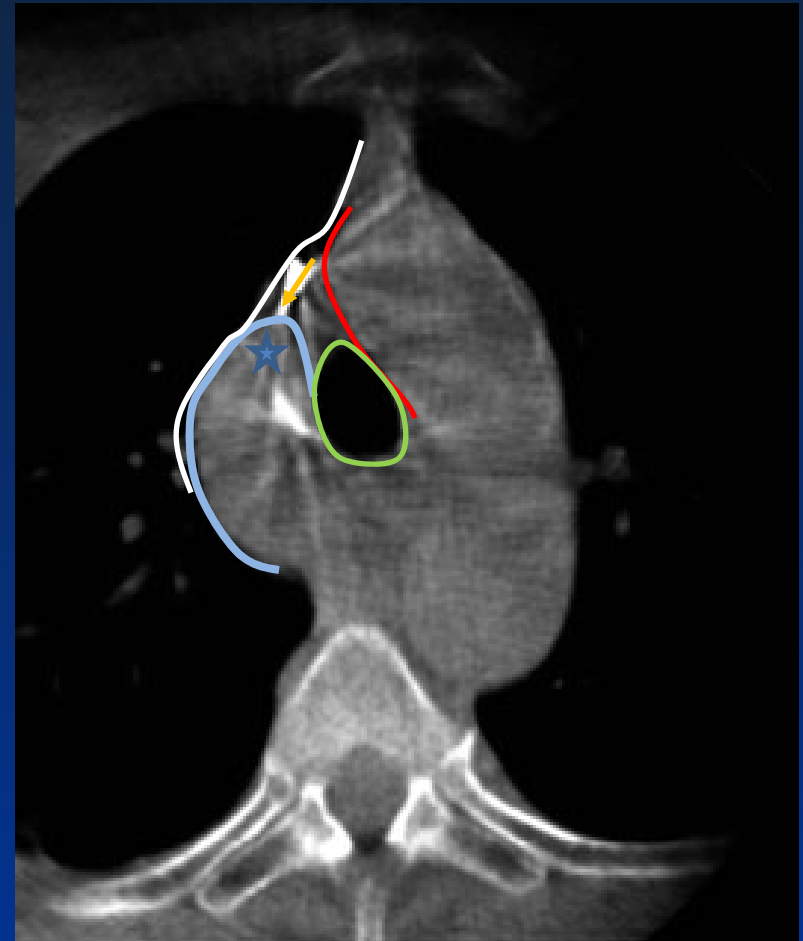
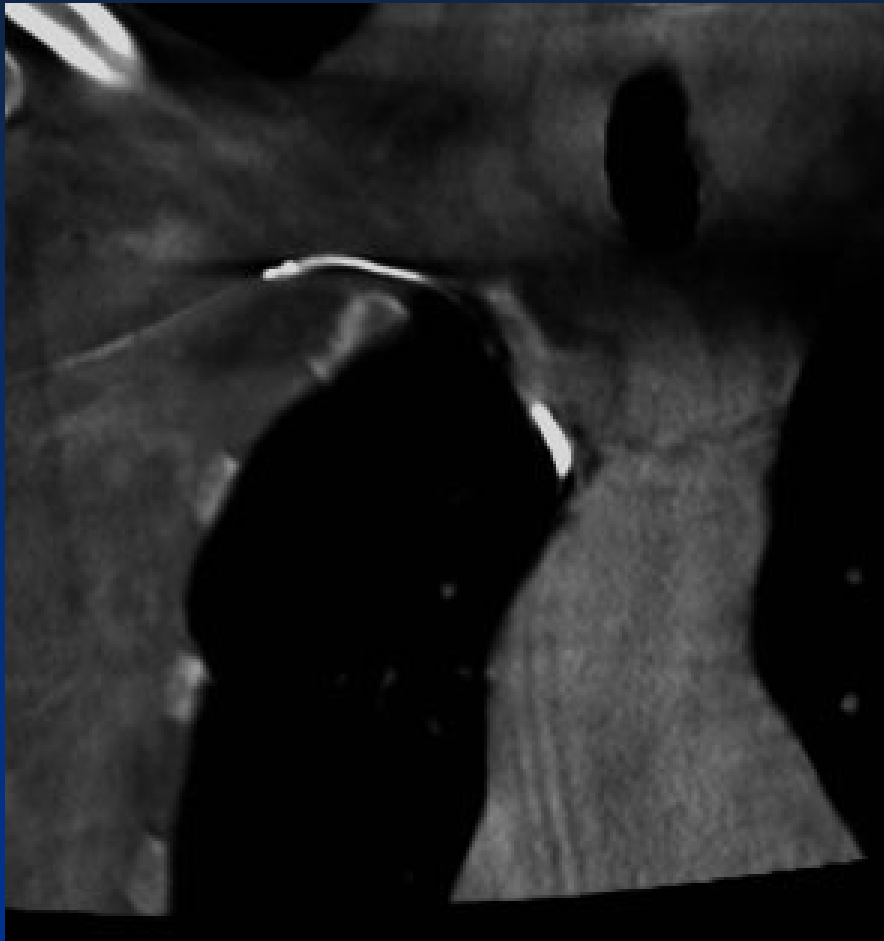




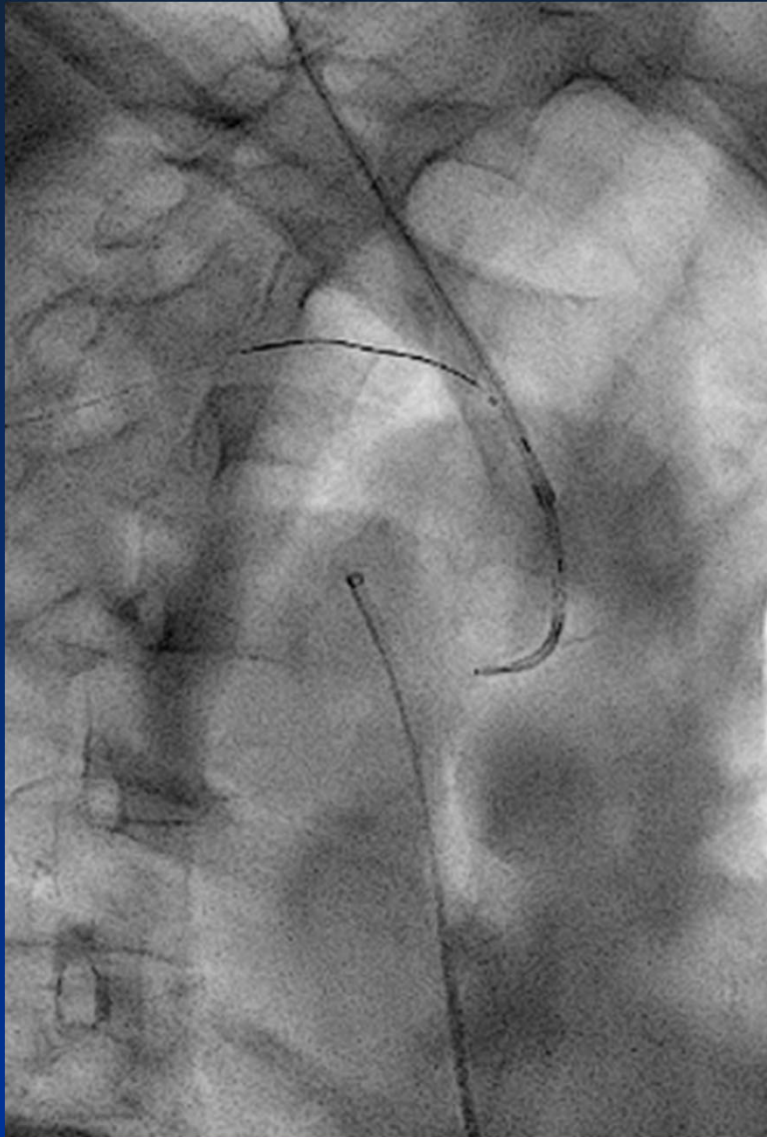
Transmediastinal dissection



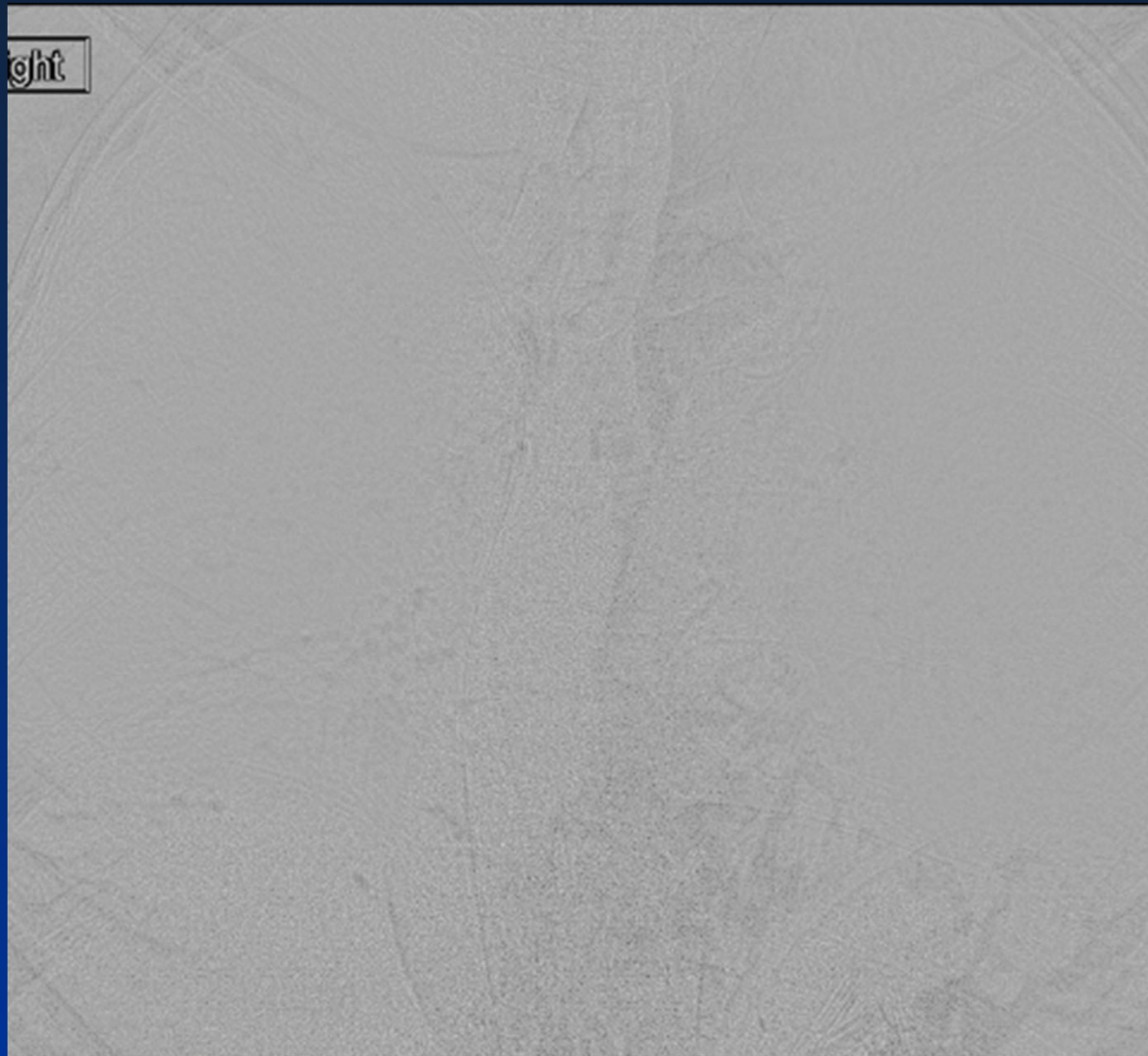
Intraprocedural Cone-beam CT



RF re-entry



DSA tractogram



Conclusions

- Pre-procedural CTV or MRV critical
- Understand the spectrum of techniques
- Central venous recanalization is (nearly) ALWAYS possible
- Non-access / no HD / hospice is not an option!



Thank you

charles.kim@duke.edu