

Advanced Techniques and Approaches for Chronic Total Occlusion in Lower Extremity PAD

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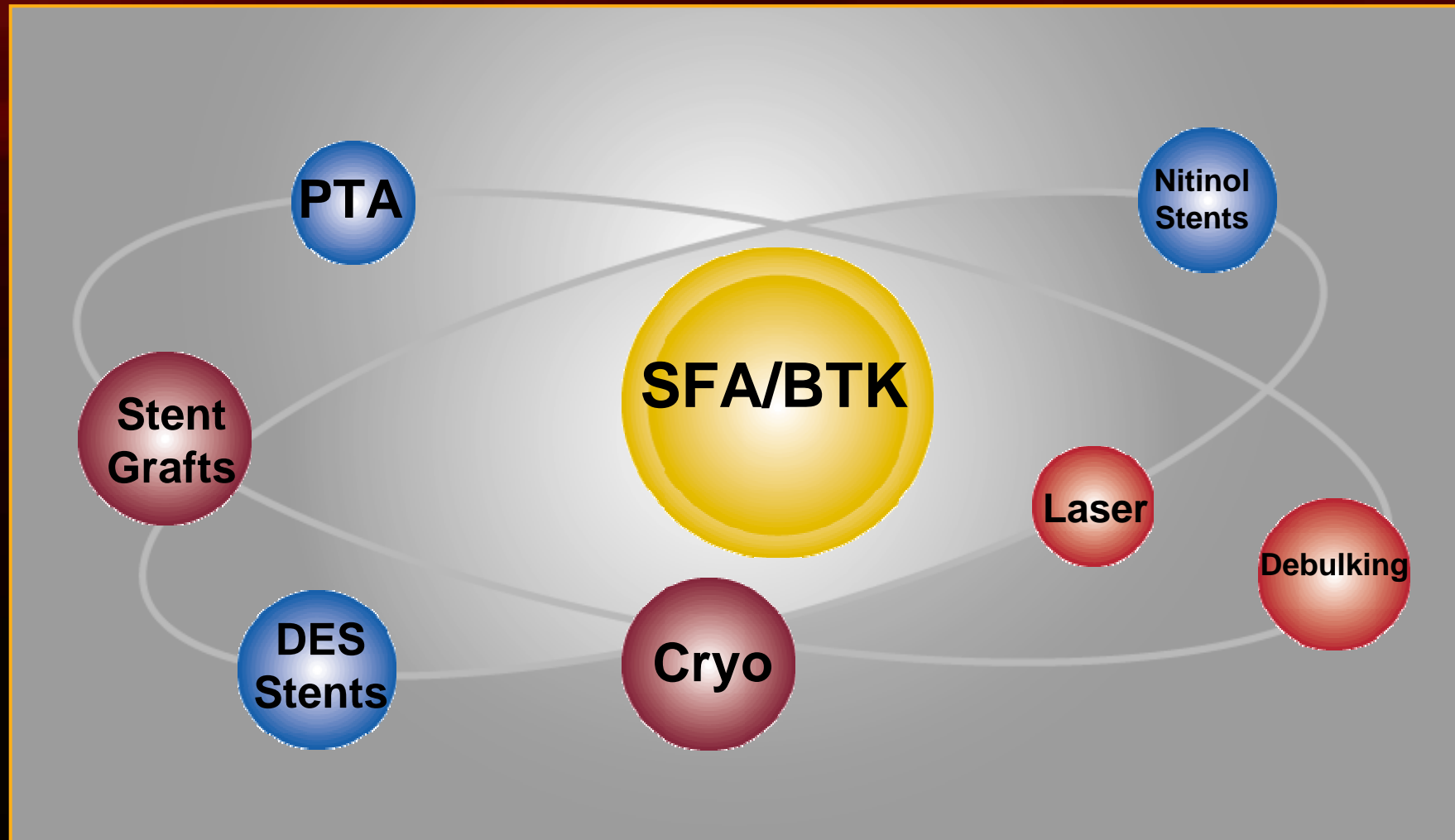
Disclosures:

- **Research Grants:**
 - Abbott Vascular Devices, Gore, Spectranetics, Lumen BioMedical
- **Consultant/Advisory Board:**
 - BSC
 - ev3, Inc.
- **Royalties/Financial Interest**
 - None
- **Speaker's Bureau**
 - None
- **Board Member:**
 - VIVA Physicians 501 (c)3 NFP

Lecture Goals:

- **Detail game plan formulation:**
 - **Must-have technologies**
 - **Must-know techniques**
- **Access issues**
- **Lesion-centric considerations**

Lower Extremity Technologies



SFA Access Techniques

Before you start, ask and answer:

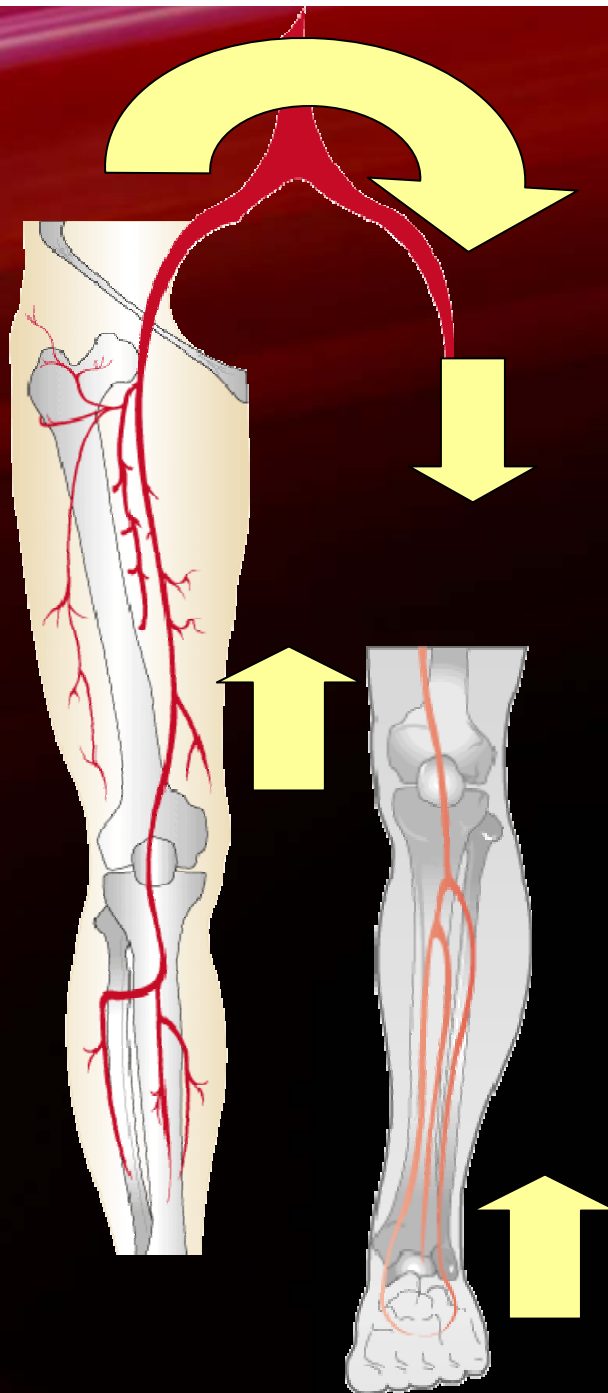
- What are all the access options?
- Is in-flow and run-off suitable?
- Lesion specifics: Length, calcium, re-entry zone
- Target vessel size and anticipated technology & sheath size requirements?
- Is there need for advanced wire control (torque and pushability)?
- Patient's bleeding risk? (antegrade/popliteal access and closure)
- Patient comfort and your radiation exposure? (antegrade/popliteal access)



Access: The Foundation of LE Interventions

Access is the key to success!

- **Retrograde access:** Discrete stenotic disease
- **Antegrade CFA access:** Ideal for long occlusive disease, retained 'pushability', torque
- **Popliteal access:** Unsuccessful SFA antegrade approach
- **Pedal access:** Unsuccessful antegrade approach (AT/PT)



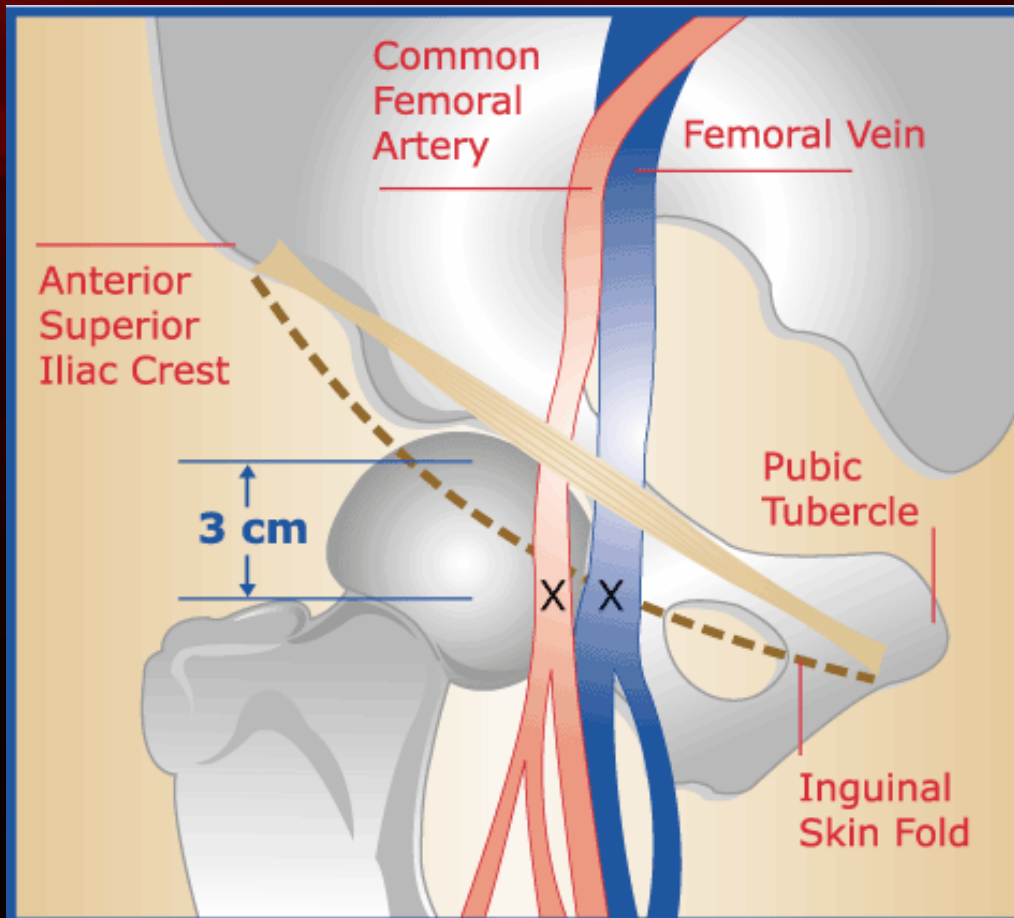
LE Access Techniques

Challenges:

- Large body habitus
- Short CFA segment
- Subcutaneous scarring and vessel calcification
- Distal visualization (antegrade access with CTO)
- Bypass grafts
- Popliteal/pedal approaches



CFA Anatomy: The Facts



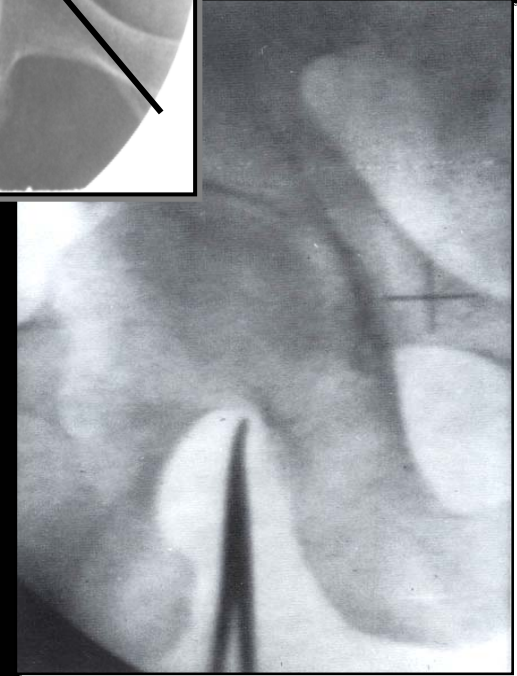
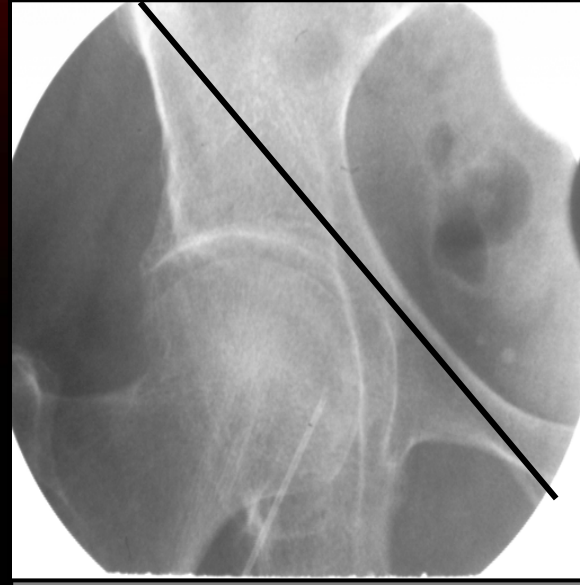
- Bifurcation above the skin fold: 72-75%¹ of the time
- Femoral pulse over CFA 92.7%¹
- Utilizing fluoroscopy..98.5% success²

Grier *Br J Radiol.* 1990;63:602.
Schnyder *CCI*, 2001;53:289.



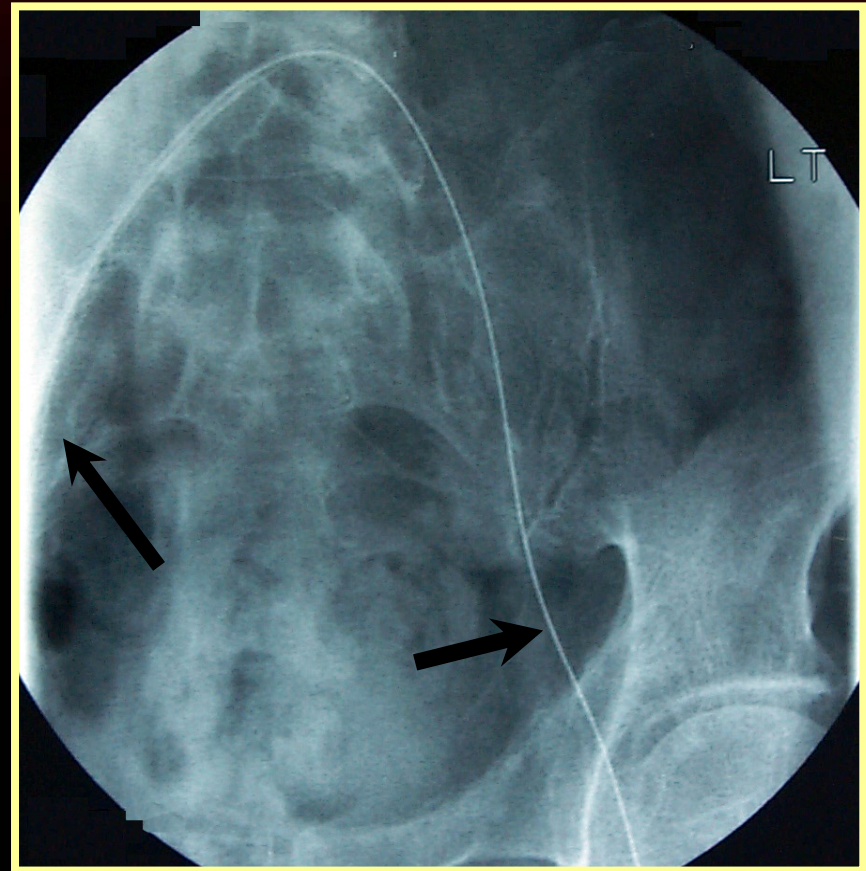
Keys to Successful CFA Access

- Tactile reference
 - Point of maximum pulse
 - 1-3 cm below inguinal ligament
- Fluoroscopy
 - Identify femoral head
- Modified Seldinger technique
 - Single anterior wall puncture

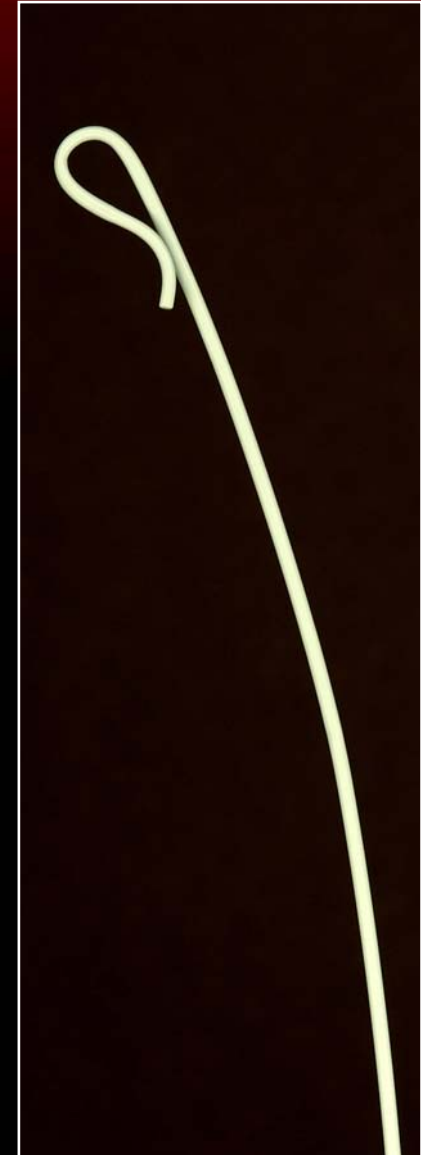
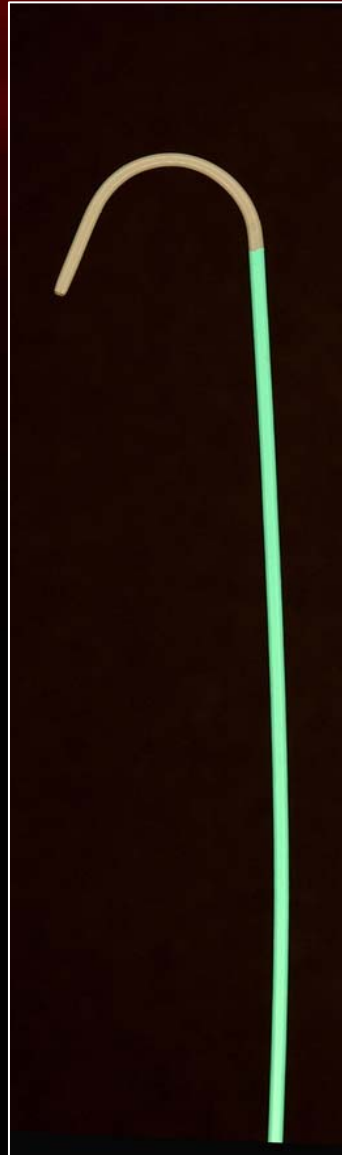


LE Access Techniques: Contra-lateral Approach

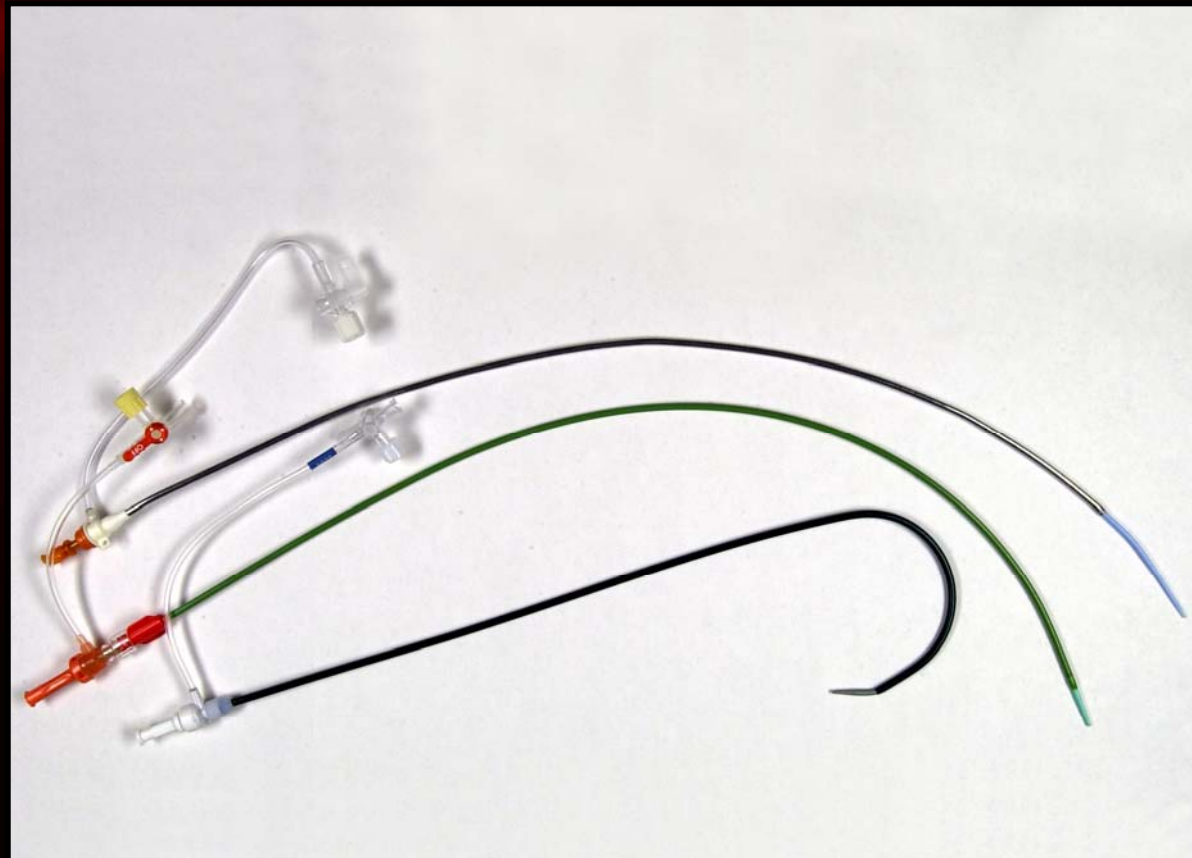
- Safer for patients
- Easier; less radiation for you
- Excellent for non-occlusive SFA disease and FP bypass grafts
- Appropriate sheath and catheter lengths a 'must'



Traversing the Aortic Bifurcation



Contralateral Approach: Sheath Selection



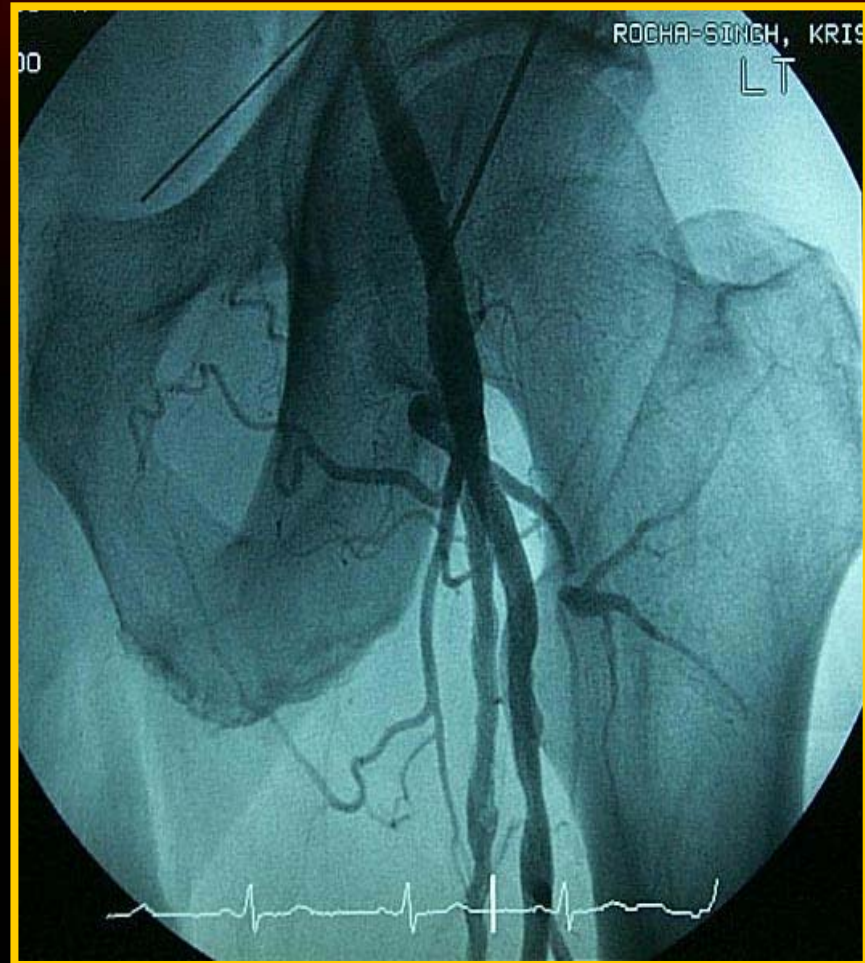
Consider:

- Technology compatibility (braided v. non-braided)
- Sheath length

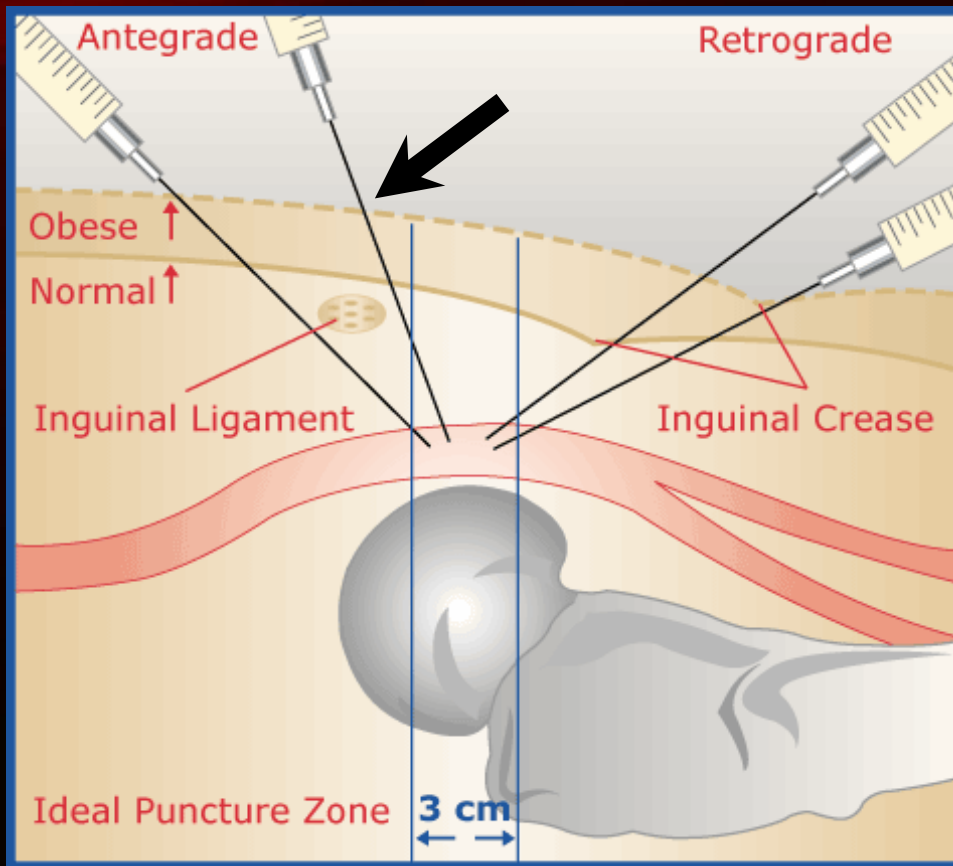


LE Access Techniques: Antegrade Approach

- More technically challenging
- Higher risk for bleeding, higher radiation exposure
- Ideal for access to long occlusive disease (wire control/ pushability)
- **Know your anatomy**



'Lay of the Land'



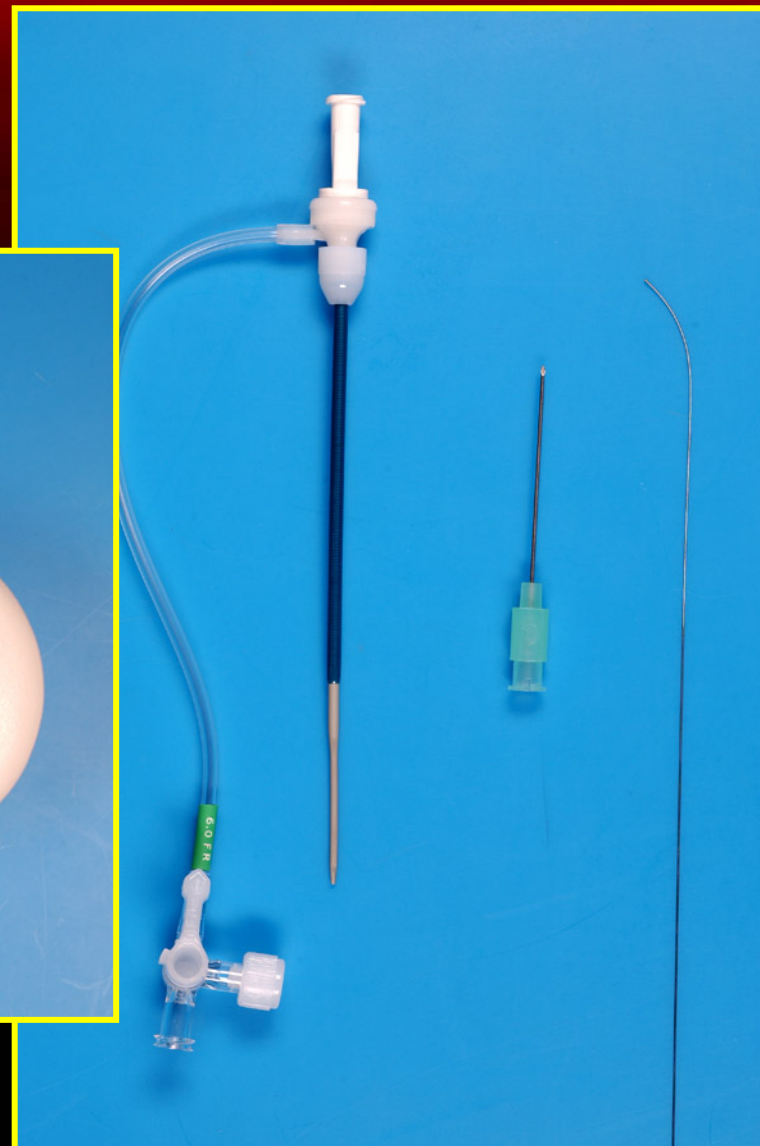
- Extreme iliac tortuosity or ABFG
- Distal popliteal/ infrapopliteal lesions
- Long occlusive disease





**Positioning
of
Puncture
Needle
over
Femoral
Head**

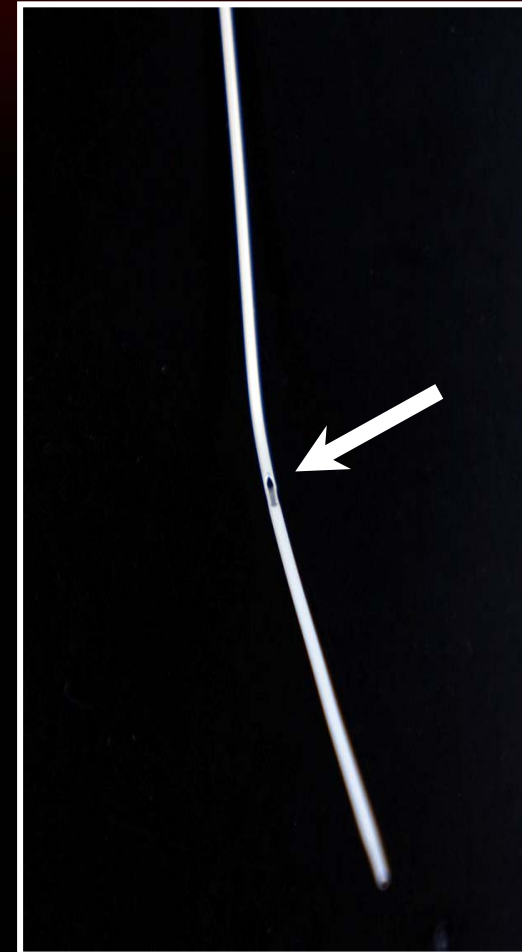
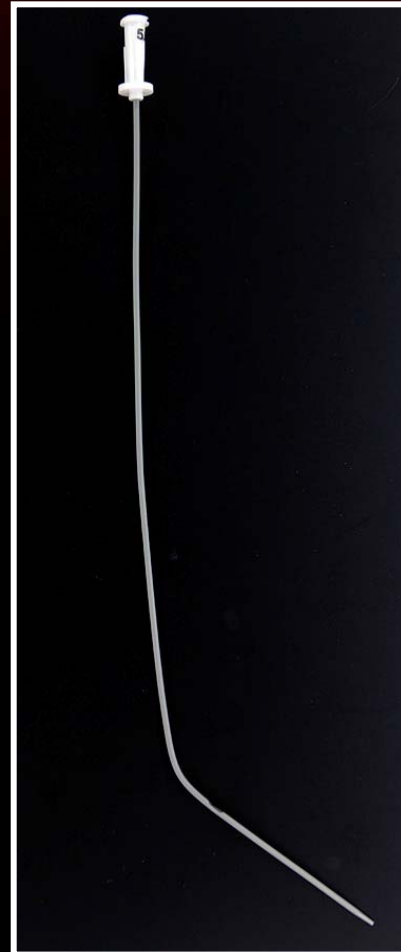


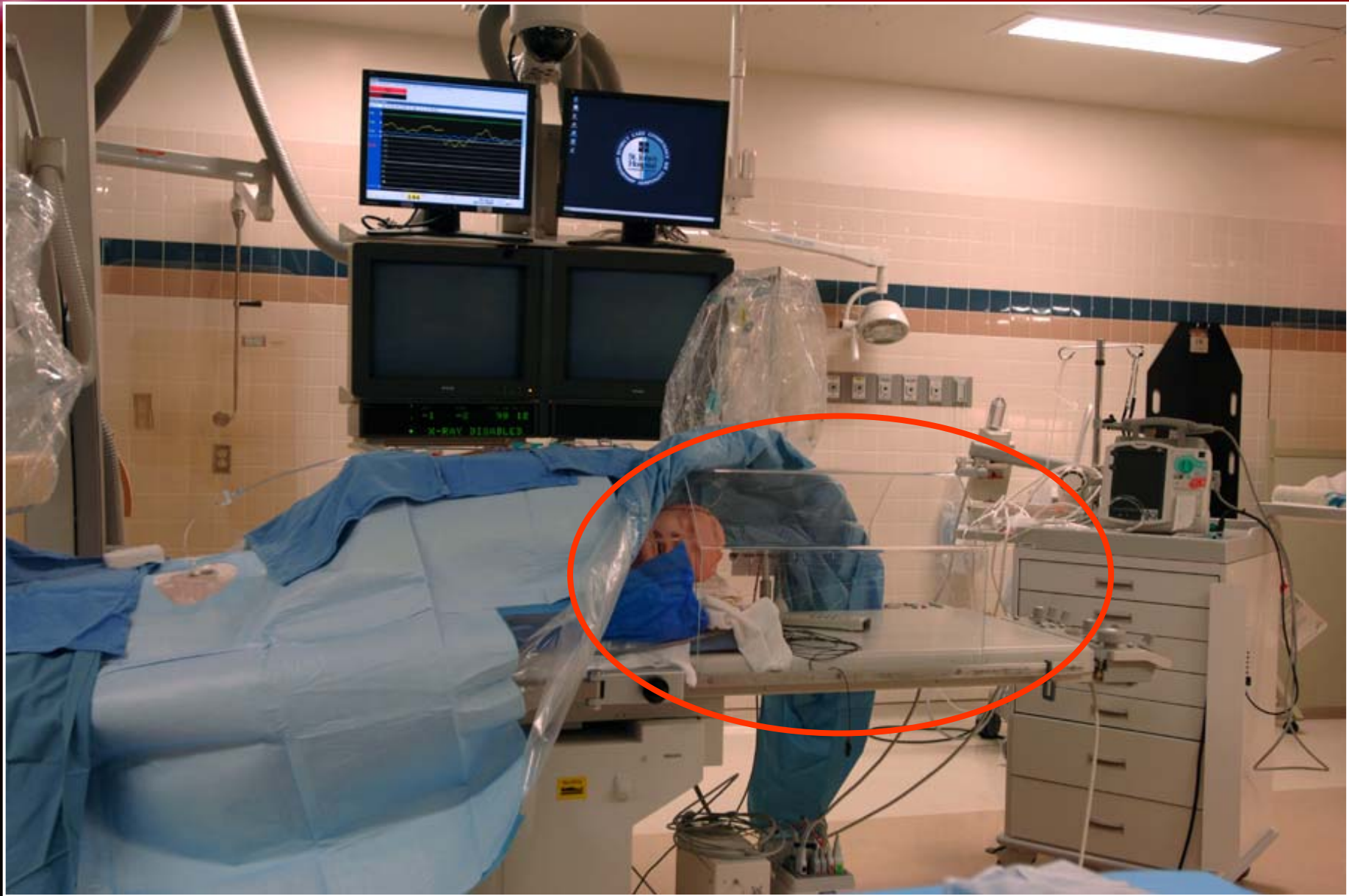


Difficult Antegrade Access into the Profunda?

- What if you enter the PFA and can not re-direct the wire into the SFA?

Consider the Cook®
Cope Dilator System





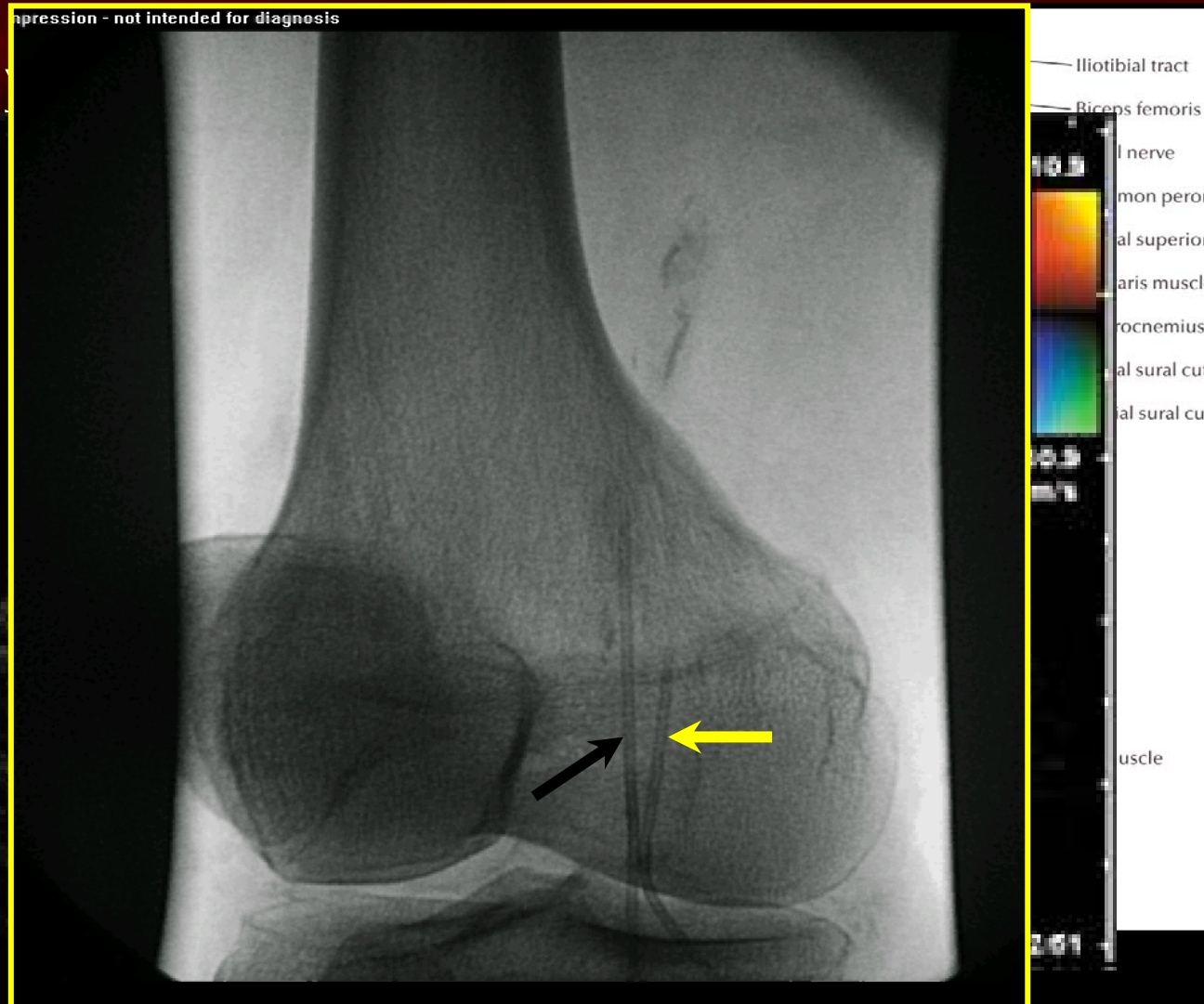
Trans-popliteal Approach: When to Consider

- Failed antegrade approach...the back door to the SFA
- Groin scarring/infection
- CFA disease
- ABFG disease
- Flush SFA occlusion



Trans-popliteal Approach: Important Considerations

- Anatomical structures at risk:
 - Artery
 - extensor digitorum longus
 - collateral ligament
 - nerve
- Risk: compartment syndrome
- Considerations: Doppler



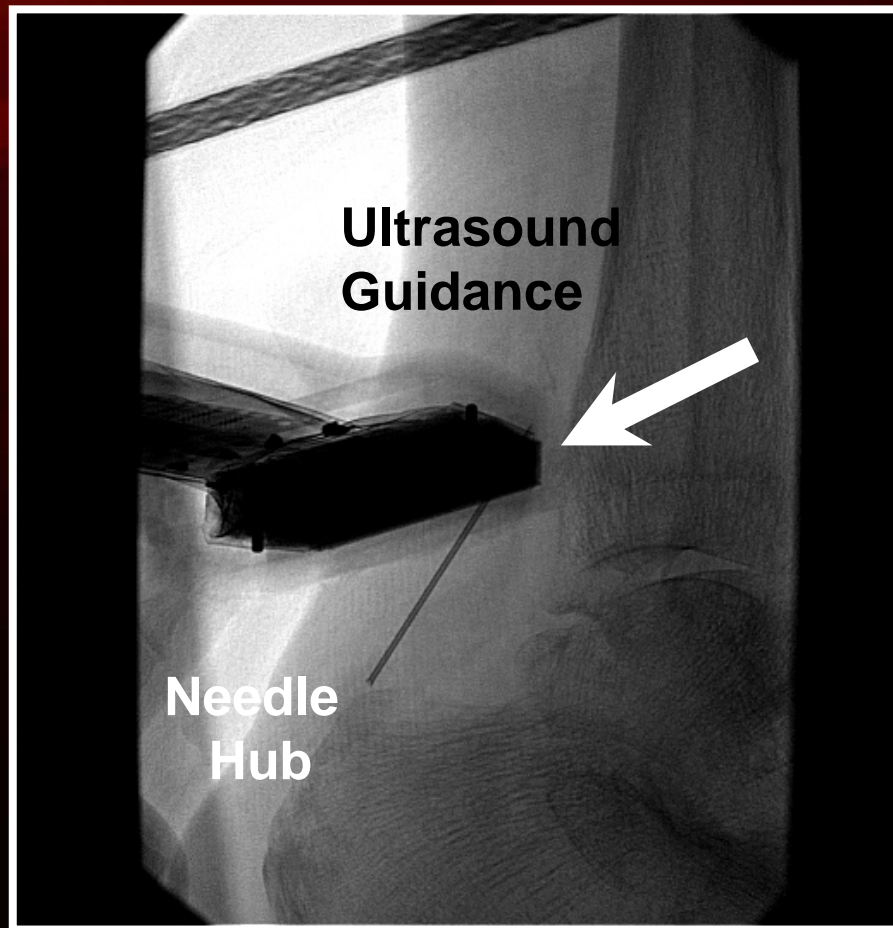
Perioperative Care



Pedal Access



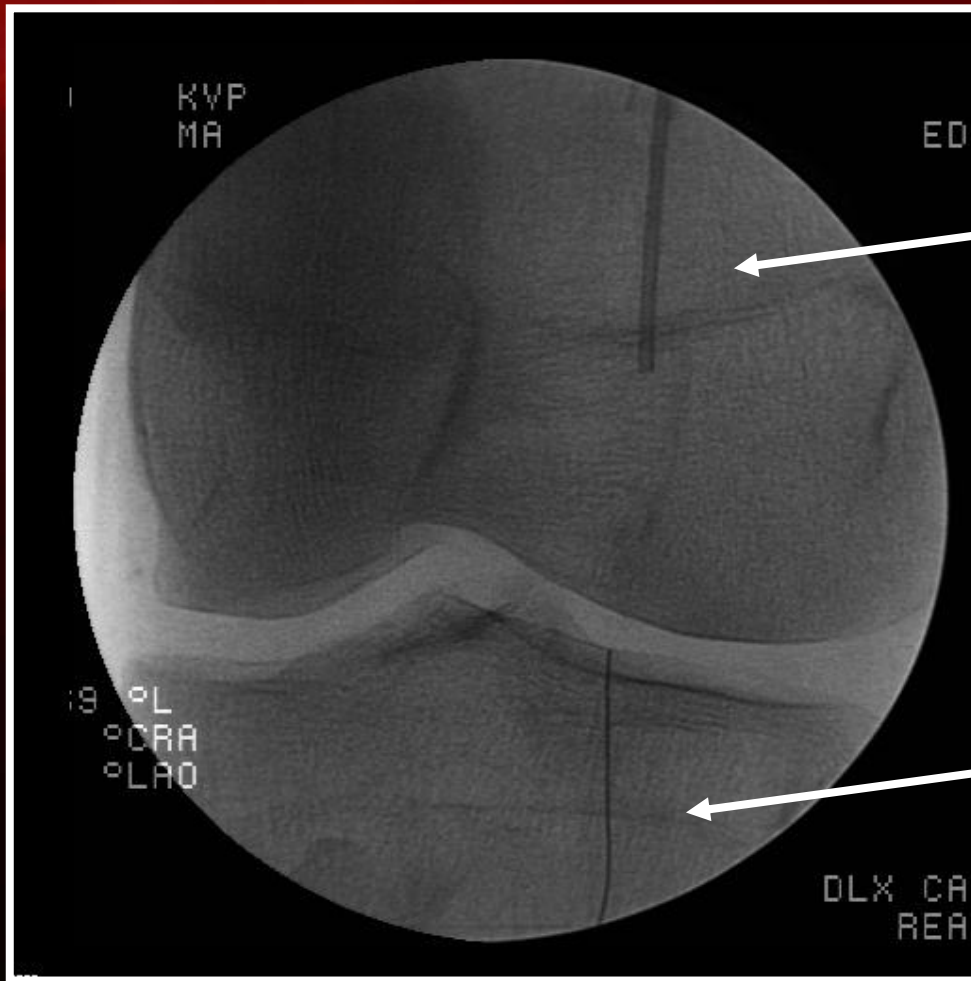
Pedal Access



- Retrograde wire passage via pedal artery (ultrasound v. angiographic guidance)
- Antegrade snare and externalization of pedal wire
- Reversal of wire; avoid passage of devices via pedal arteries



Pedal Access



**Antegrade CFA access
(4 F catheter *for snare*)**

**Hydrophilic Wire
(*via PT*)**

Externalize the retrograde wire with a snare

Lesion Centric Algorithm for LE Intervention

**Lesion Length &
Location**

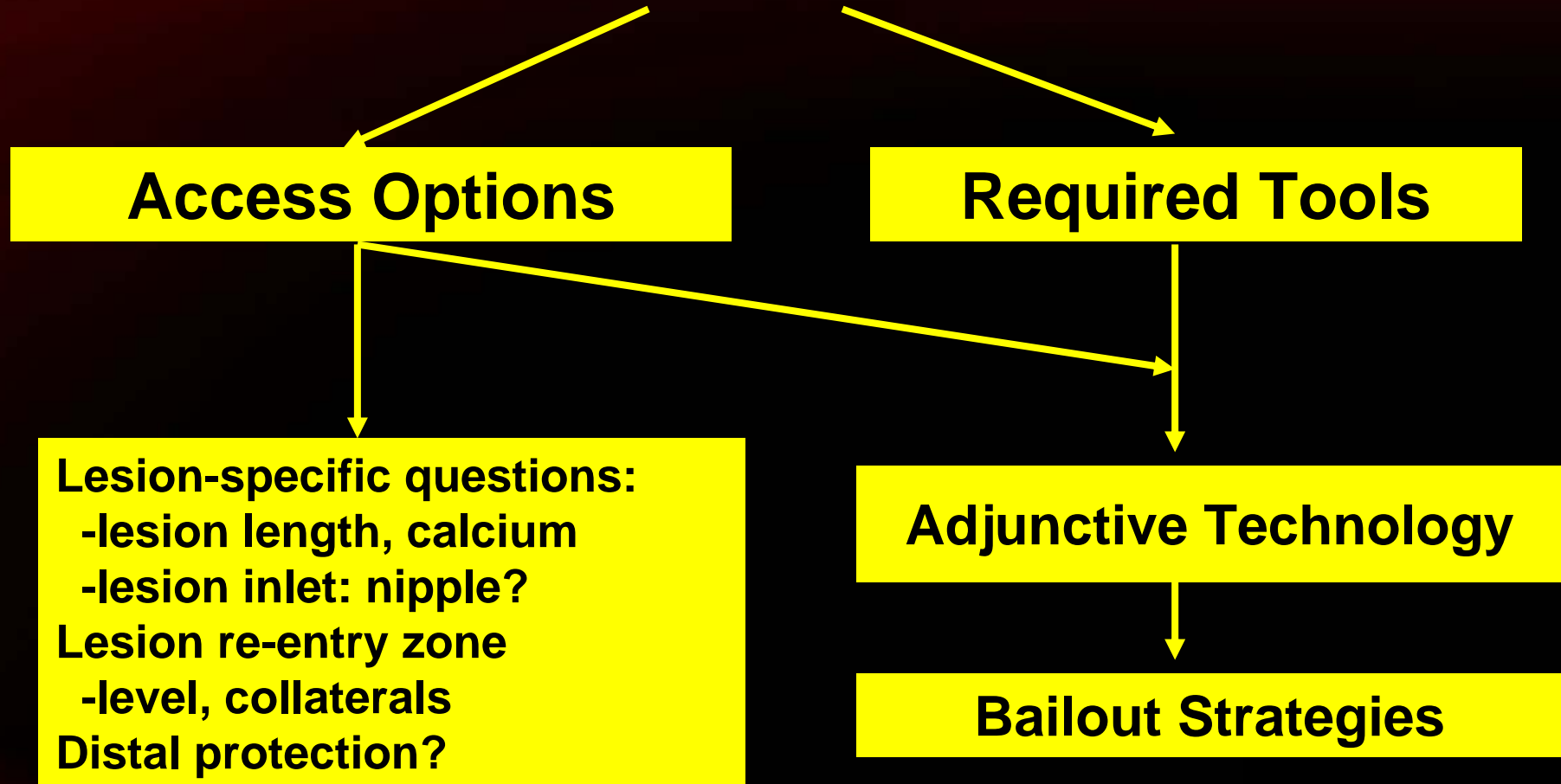
Access Options

Required Tools

Lesion-specific questions:
-lesion length, calcium
-lesion inlet: nipple?
Lesion re-entry zone
-level, collaterals
Distal protection?

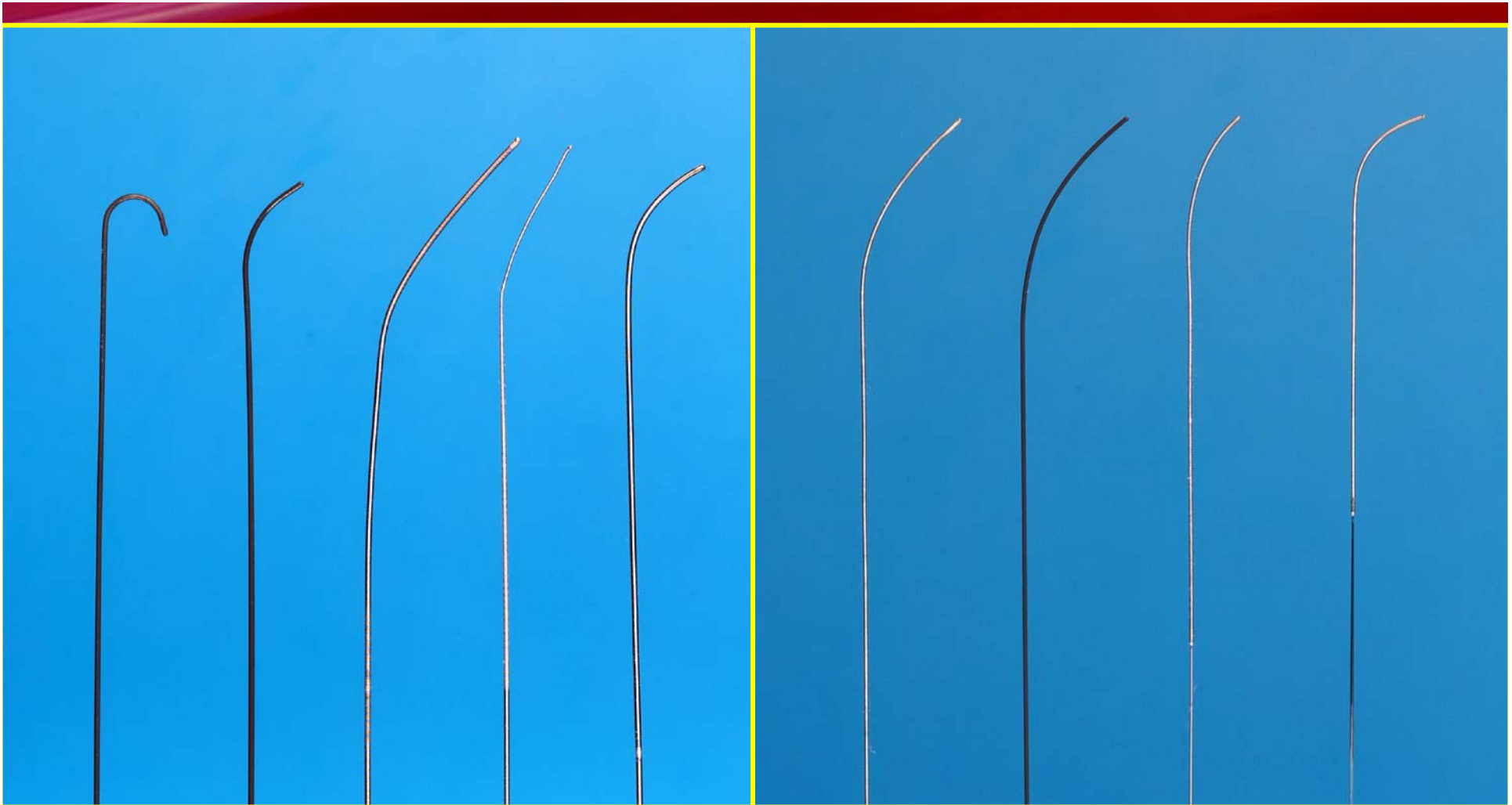
Adjunctive Technology

Bailout Strategies



Tools for CTO Intervention





Wire Choices: “Must-haves”:
Hydrophilic wire set
Extra-stiff wire set
Coronary wire set

Tornus Design Features



Eight individual wires (0.007") stranded together

- Made of stainless steel for extra support strength
- Silicone coating on inner/outer surfaces
- OTW system, 135cm working length
- Compatible w/ 0.014" guide wire only (smallest ID=0.016")
- Not designed to be an infusion catheter (i.e.. Transit, Excelsior, etc.)

Available in Two Sizes: 2.1Fr & 2.6Fr

Tornus 2.1 Fr



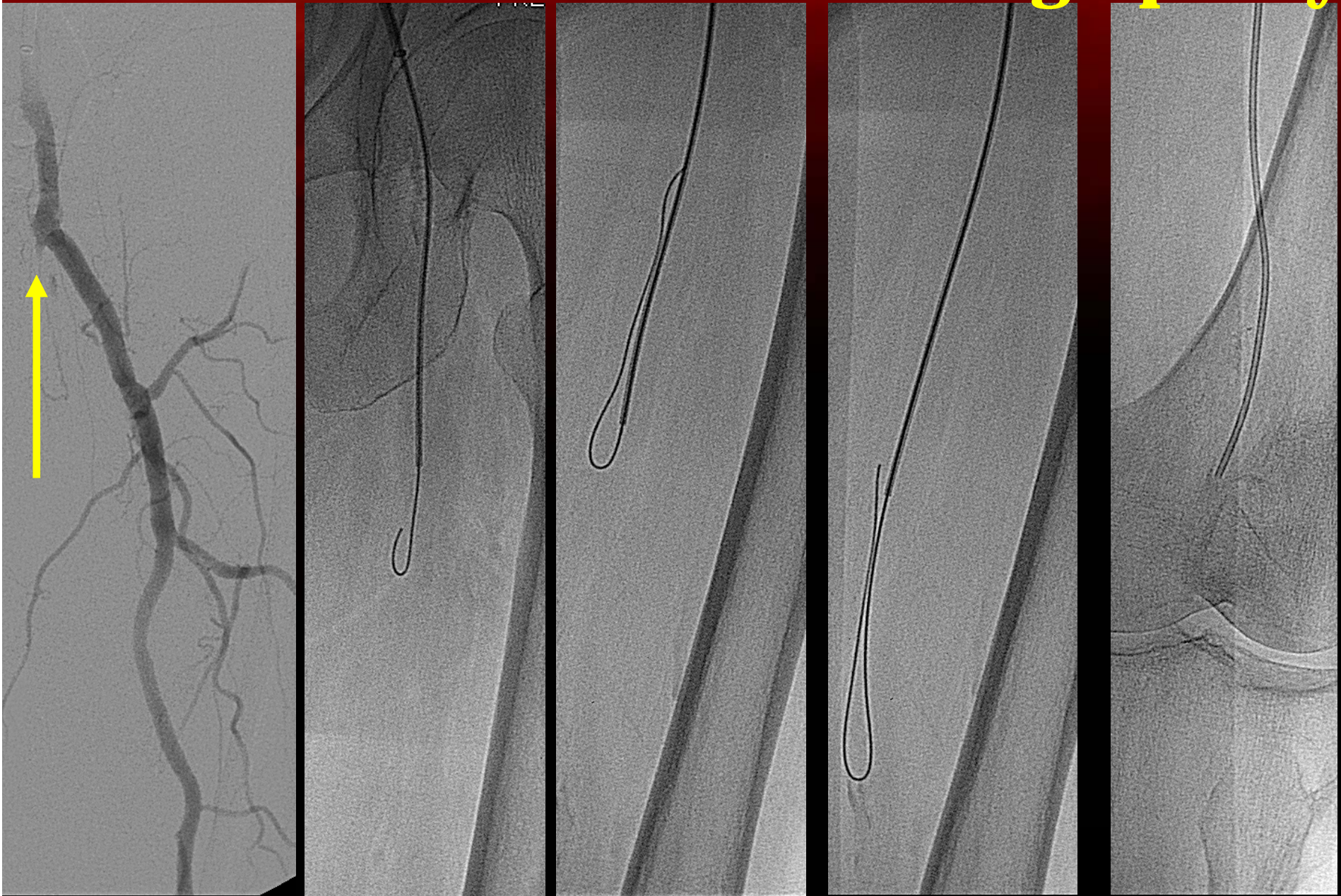
Tornus 2.1Fr is more flexible

Tornus 2.6 Fr



Tornus 2.6Fr has better push and more

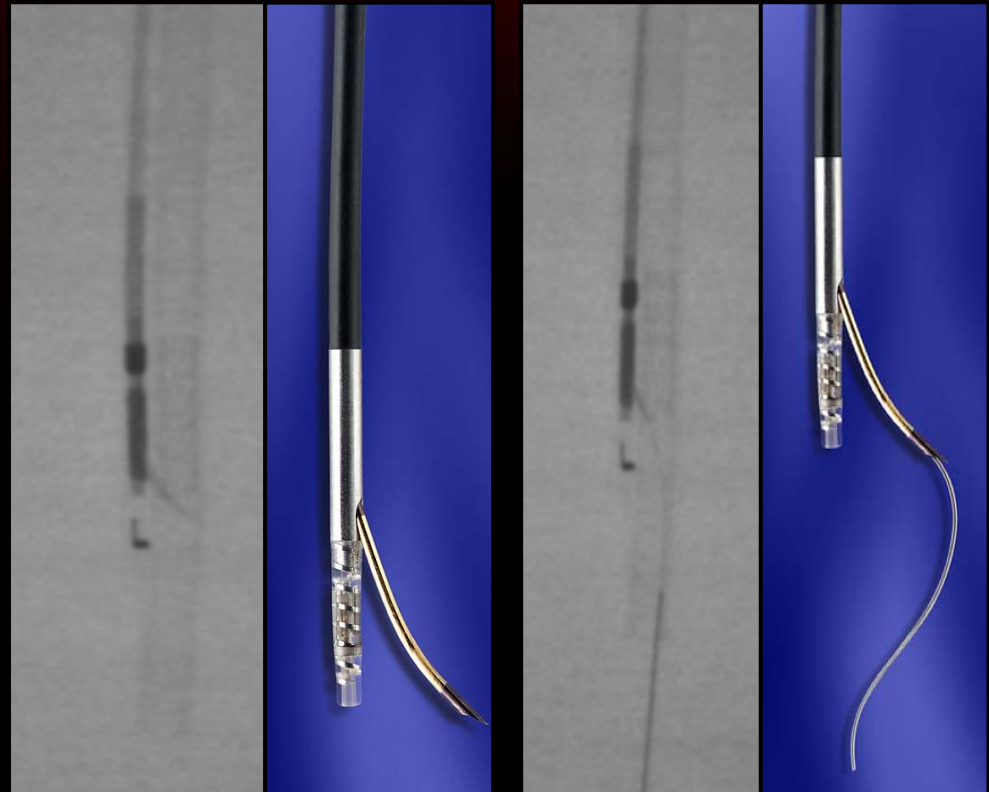
A Word About Subintimal Angioplasty



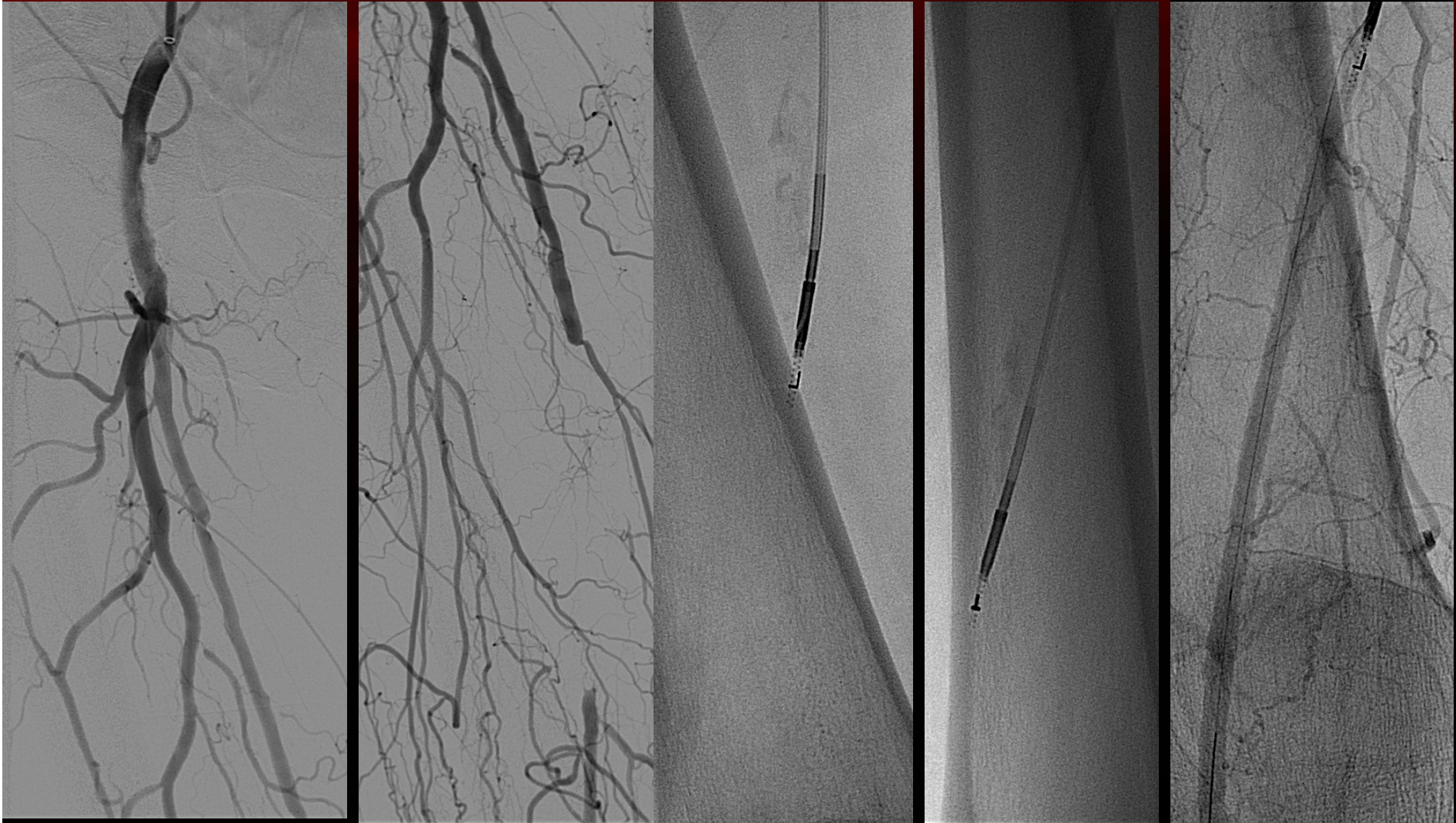
Outback[®] LTD Re-Entry Catheter

'D' marker = Deploy

- Deploy cannula in either 'T' or 'L' view
- Advance single wire (0.014")
- Retract nitinol needle
- Remove catheter



Outback Catheter Case Example



Conclusions:

Advanced Techniques

- **Develop a complete 'game plan'**
- **Pay attention to access**
- **Subintimal technique and re-entry catheters are 'must-have' technique and technology in LE occlusive disease**