



# Sub-intimal recanalization of peripheral occlusive disease with IVUS guided true lumen re-entry.

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SCIENCE Courses

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# Disclosure

Speaker name:

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)
  
- I do not have any potential conflict of interest

# Chronic total occlusions (CTO)



- CTO are present up to 40% in patients with PAD
- Sub-intimal Angioplasty is a common strategy for CTO
- 15-25% failure rate to re-entry true lumen
  - Intraluminal crossing may be not possible
  - Calcification
  - Lesion length
  - CTO Cap Morphology

# Luminal Re-entry Techniques



- Standard Hydrophilic wire/Catheter / and 0,018 wires
- Back end of Hydrophilic wire
- CTO wire / Angled catheter
- SAFARI / Cart / Retrograde access
- Standard re-entry devices: Outback
- Pioneer Plus: IVUS guided re-entry

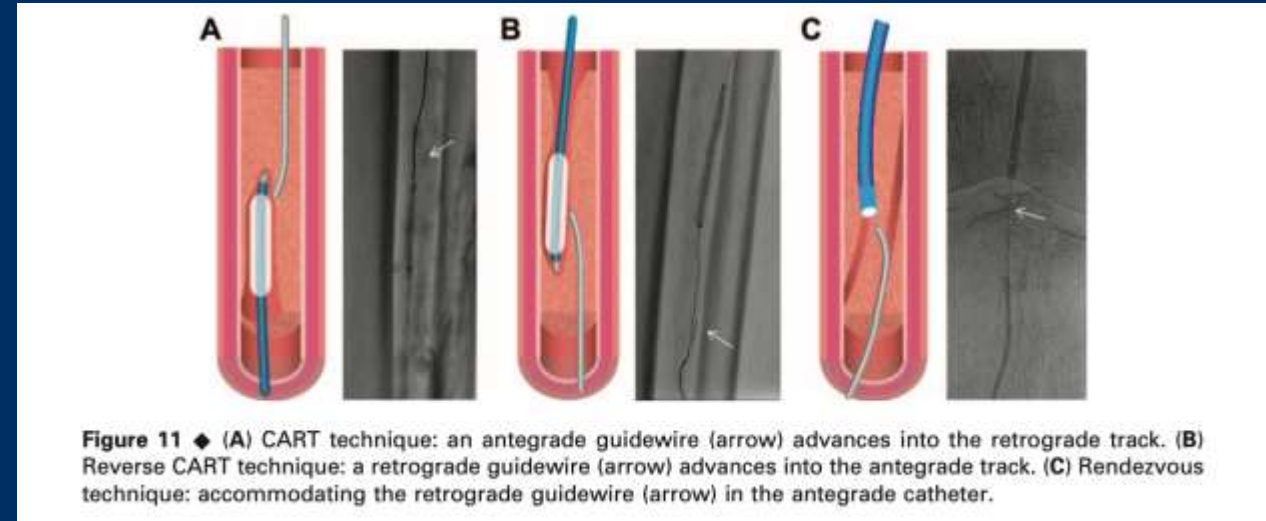
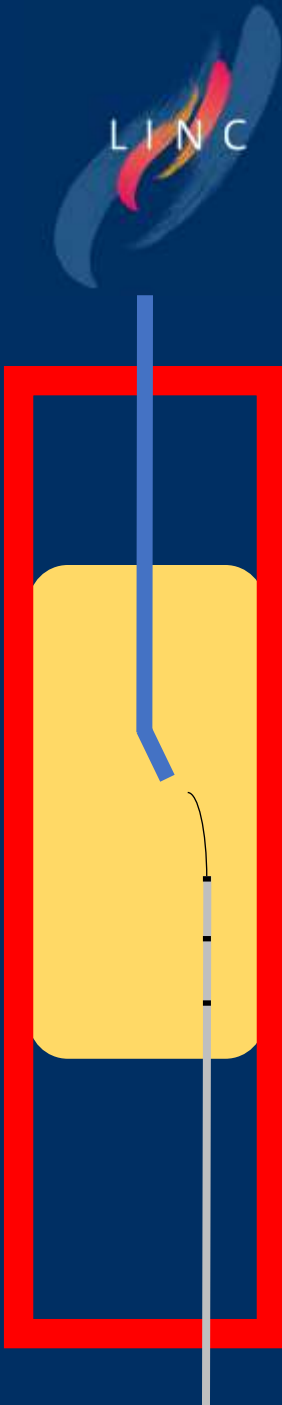
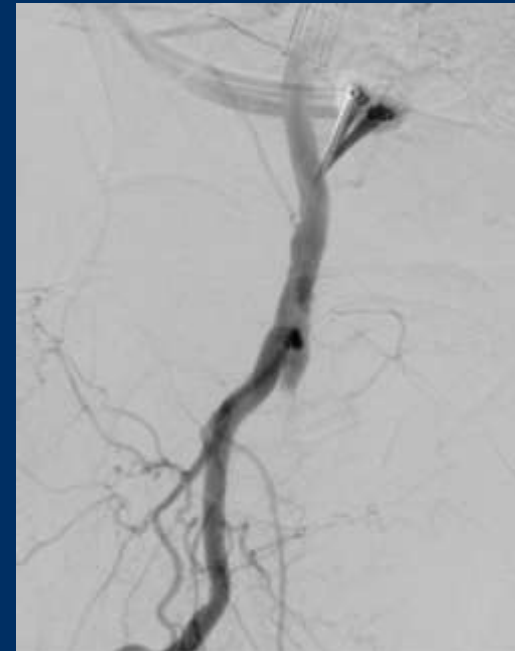


Figure 11 ♦ (A) CART technique: an antegrade guidewire (arrow) advances into the retrograde track. (B) Reverse CART technique: a retrograde guidewire (arrow) advances into the antegrade track. (C) Rendezvous technique: accommodating the retrograde guidewire (arrow) in the antegrade catheter.

- Re-entry Device allow controlled true-lumen re-entry, increasing technical success for complex cases

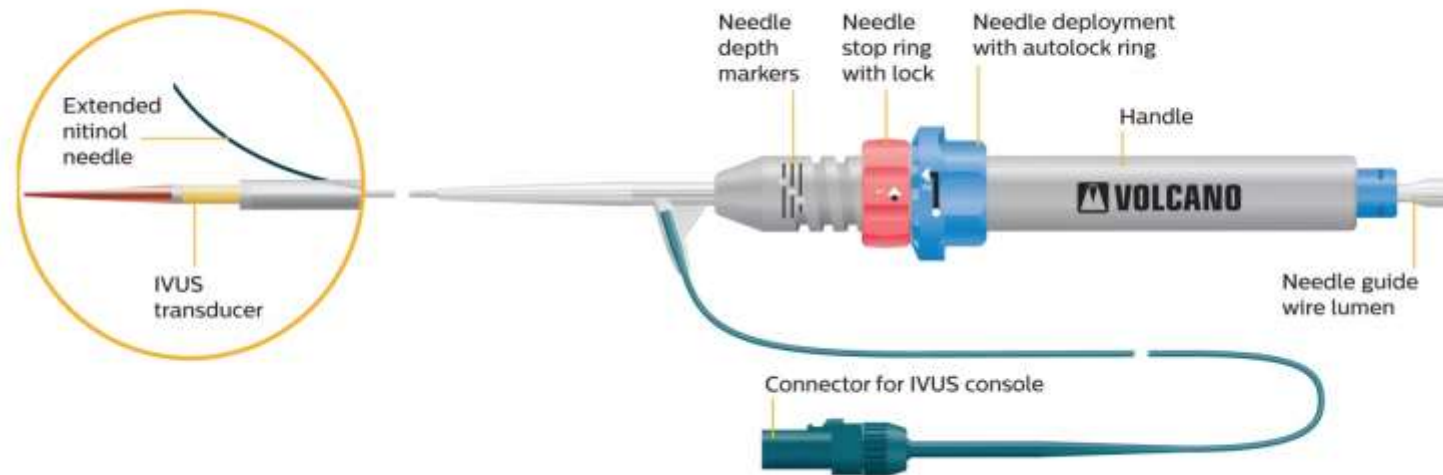
# Luminal Re-entry Devices

- Accuracy
  - Avoid Collateral/side-branch occlusion => ischemia
  - Prevent Vessel compromise at arterial bifurcation => jeopardize profunda
- Reduce:
  - length of Angioplasty Segment
  - procedure time
  - contrast
  - risk of complications



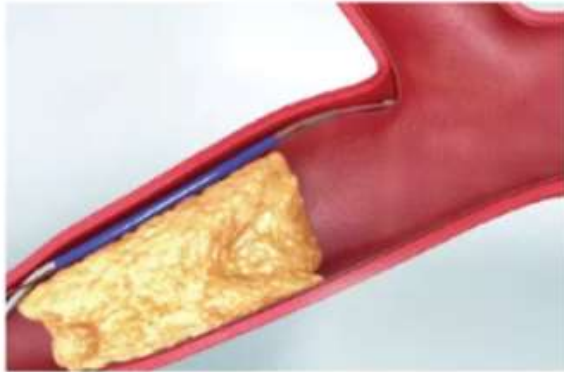
# IVUS Pioneer Plus

- 6Fr Compatible device
- Dual wire system: 0.014 system
- 24G Needle => re-entry non-hydrophilic guide wire



# IVUS Pioneer Plus

1



Insert the Pioneer Plus catheter over the 0.014" subintimal guidewire.

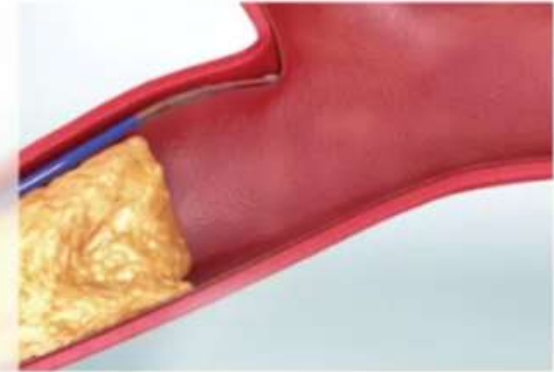
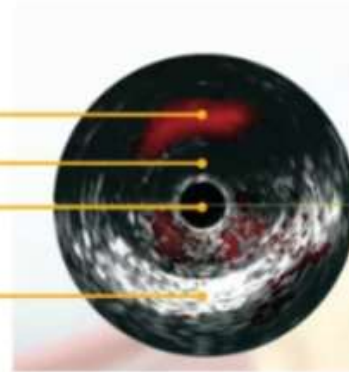
2

True lumen with ChromaFlo feature

Intima

Pioneer Plus catheter in subintimal space

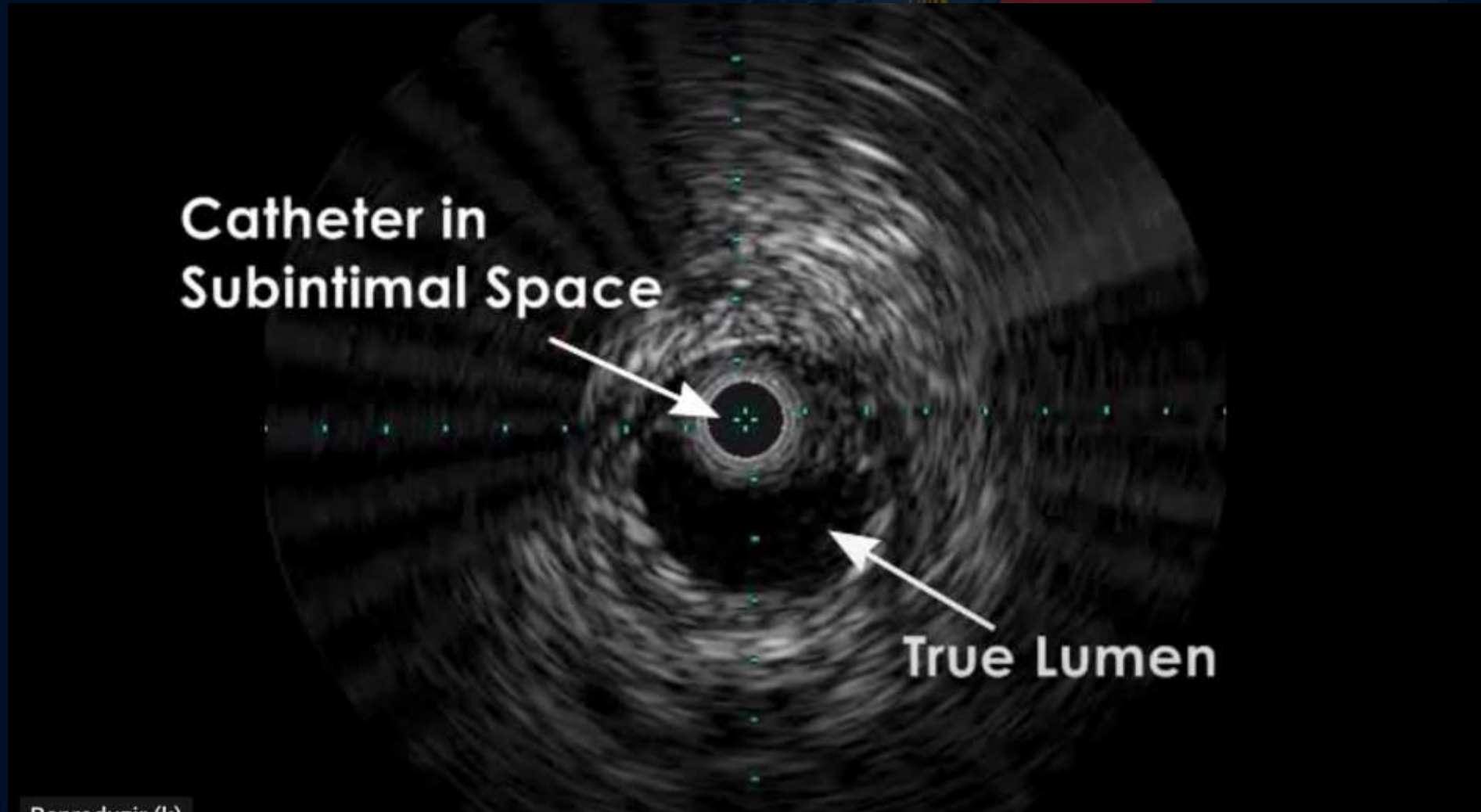
Adventitia



Use IVUS to precisely target reentry. IVUS is used in order to localize the true lumen by the presence of flow. The Pioneer Plus catheter should be rotated so the true lumen (identified by the ChromaFlo feature) is at the 12 o'clock position.

Needle will deploy at 12:00 position  
Rotate the catheter no more than 180 degrees: gently

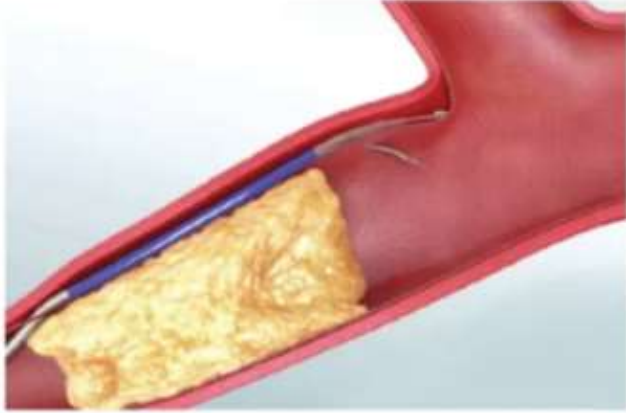
Rotate catheter using ChromaFlo as a guide  
Set distance using the 1 mm marks





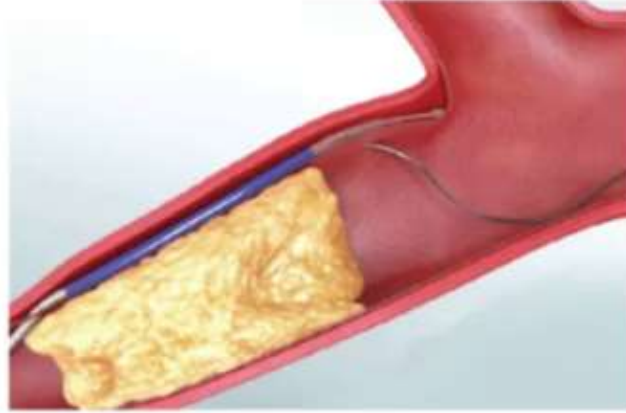
# IVUS Pioneer Plus

3



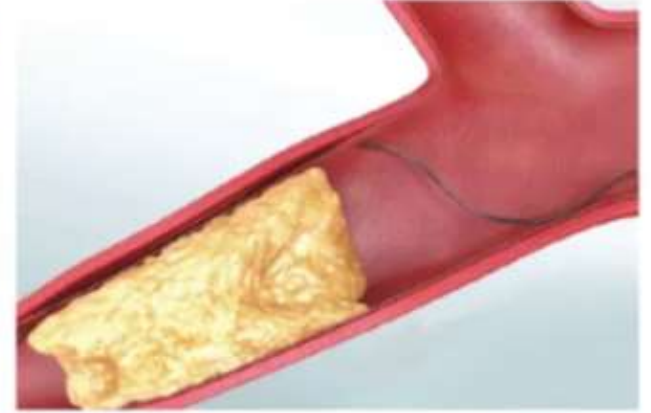
Deploy the nitinol needle to create a pathway to the true lumen.

4



Advance a non-hydrophilic 0.014" guidewire through the needle into the true lumen. This guidewire will be used to facilitate the placement of subsequent catheters after the Pioneer Plus catheter is removed.

5

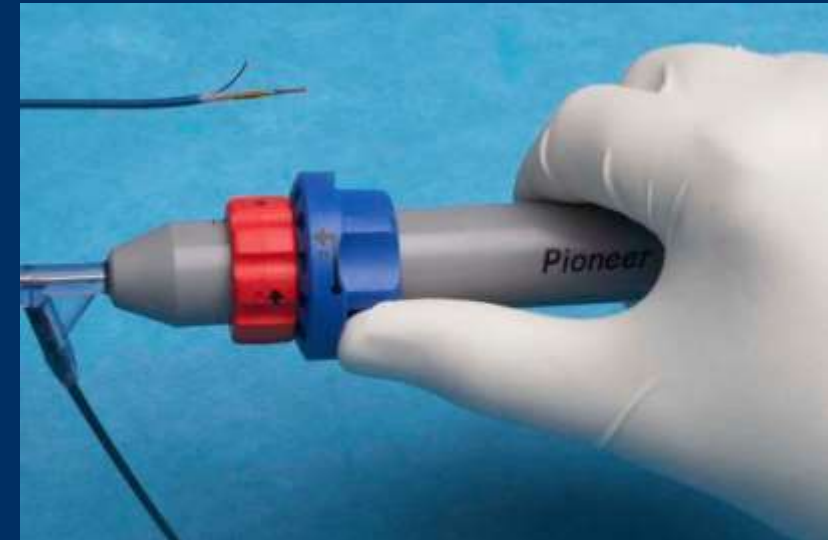
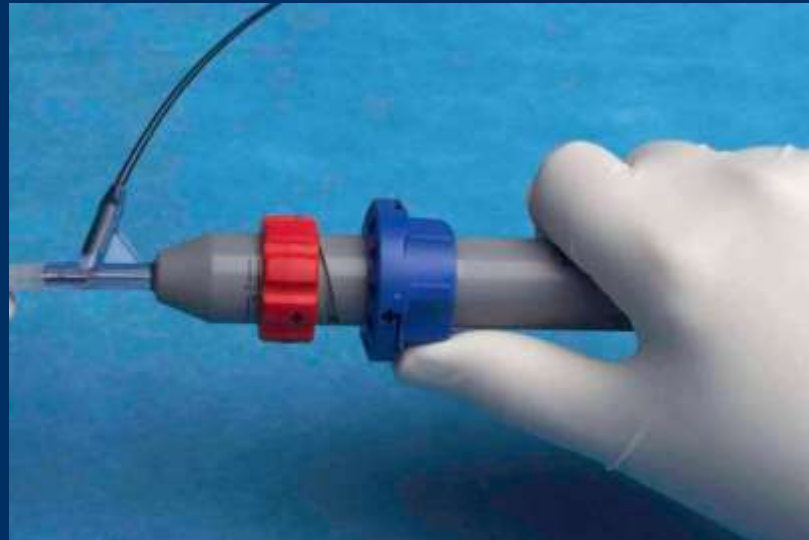
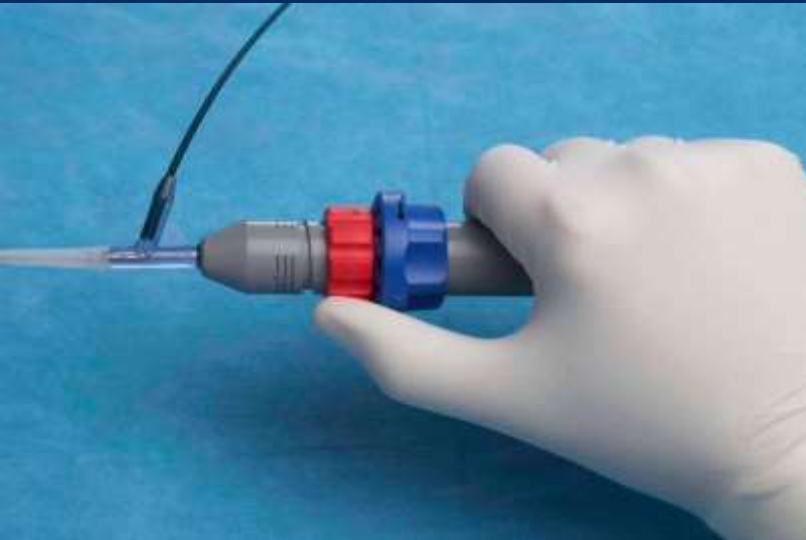


Retract the needle and remove the Pioneer Plus catheter. The vessel is now ready for additional interventions.

# Needle Deployment



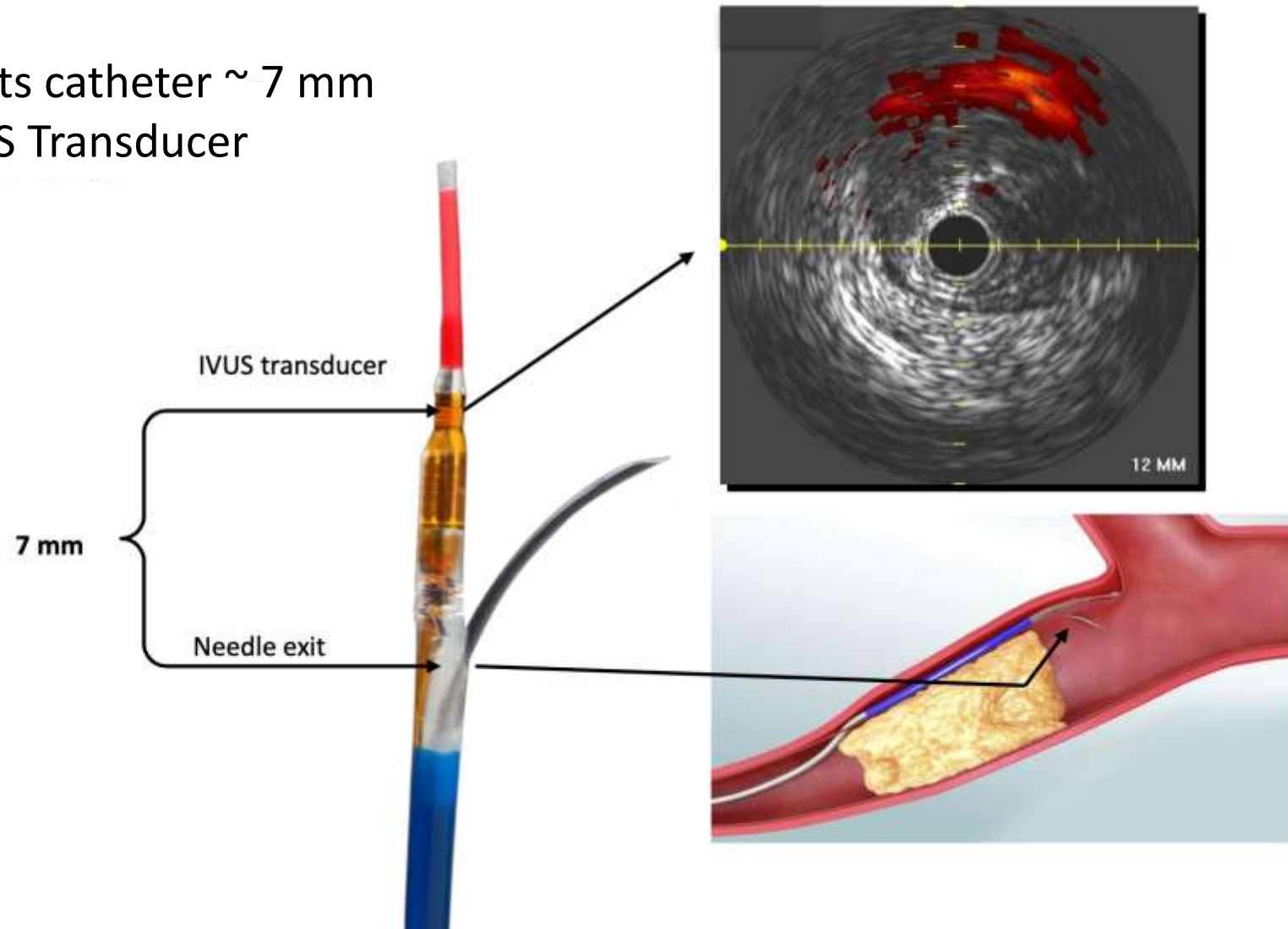
1. Set the depth of the Needle: 3, 5 or 7 mm – adjusting the Red Ring
2. Slightly rotated Blue Ring
3. Advance Blue Ring forward, deploying the needle



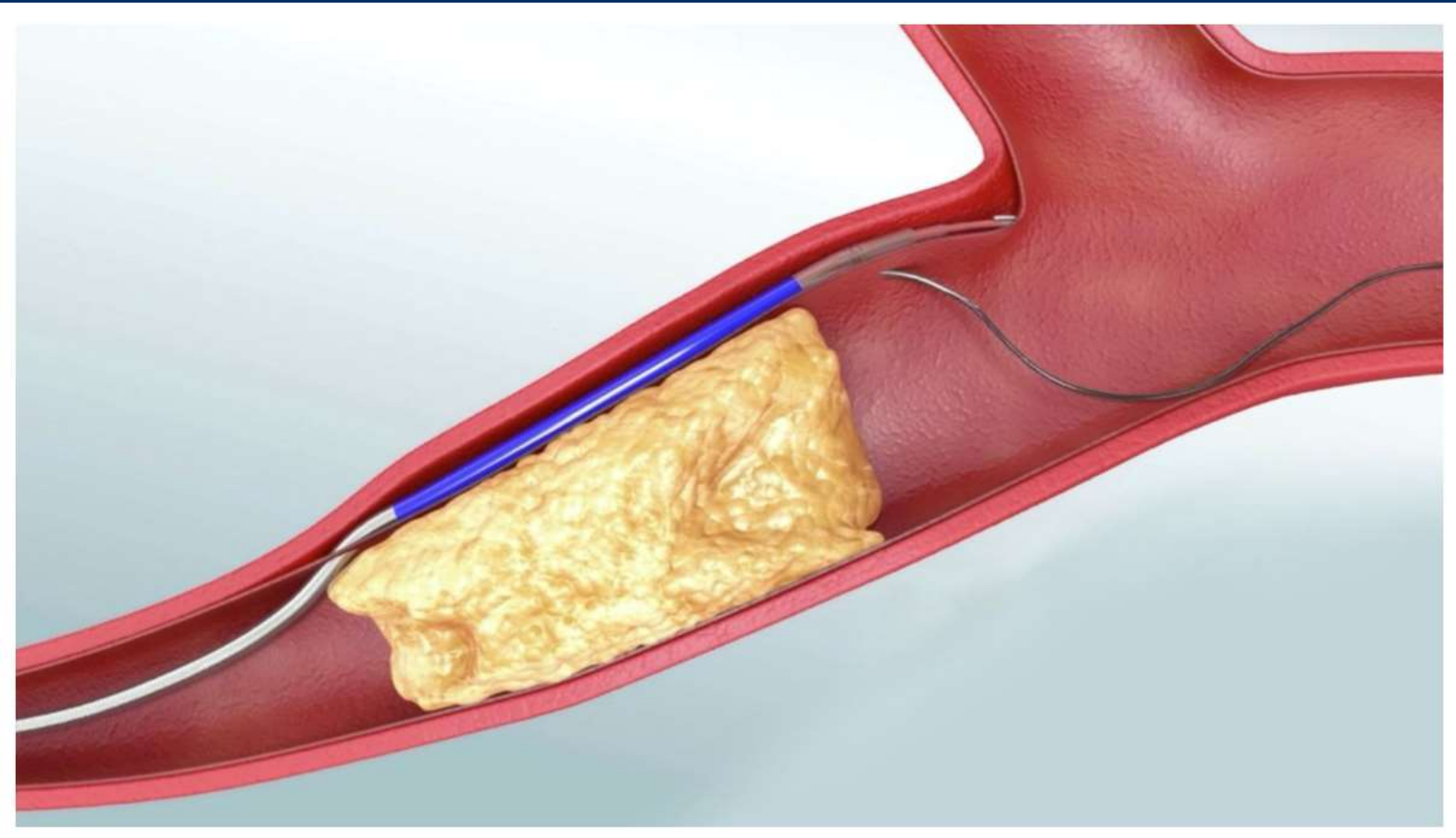
# Needle Deployment



- Needle Exits catheter ~ 7 mm Below IVUS Transducer



# Advance Wire



29/11/2019 23:12  
WL: 346 WW: 542

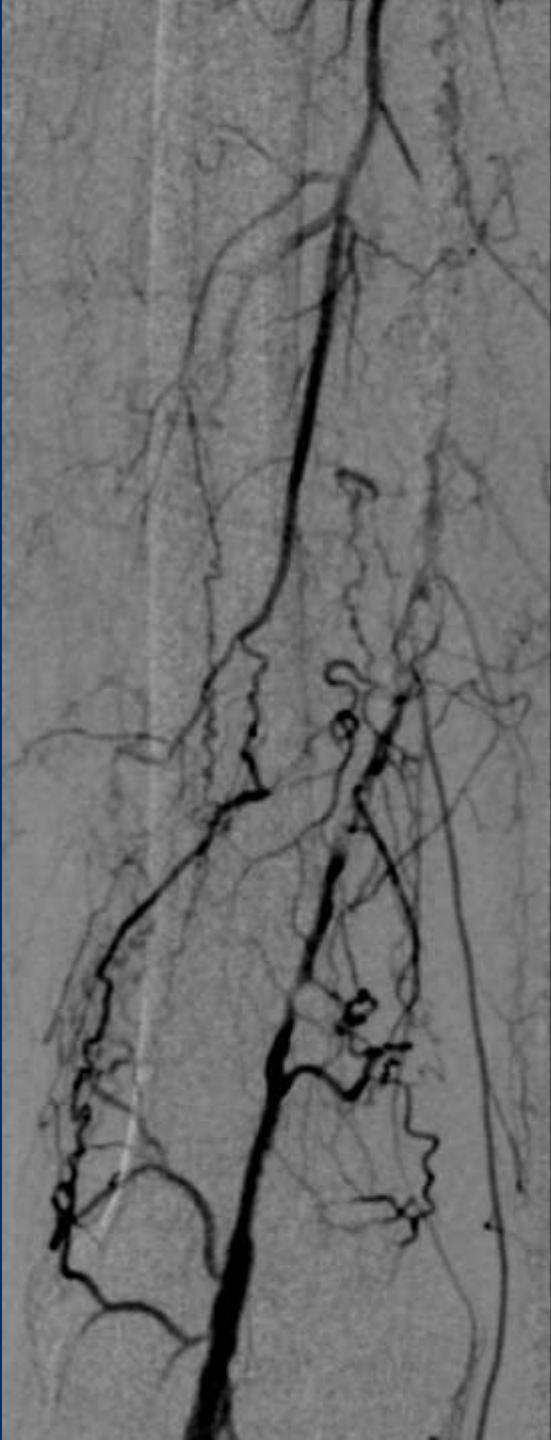


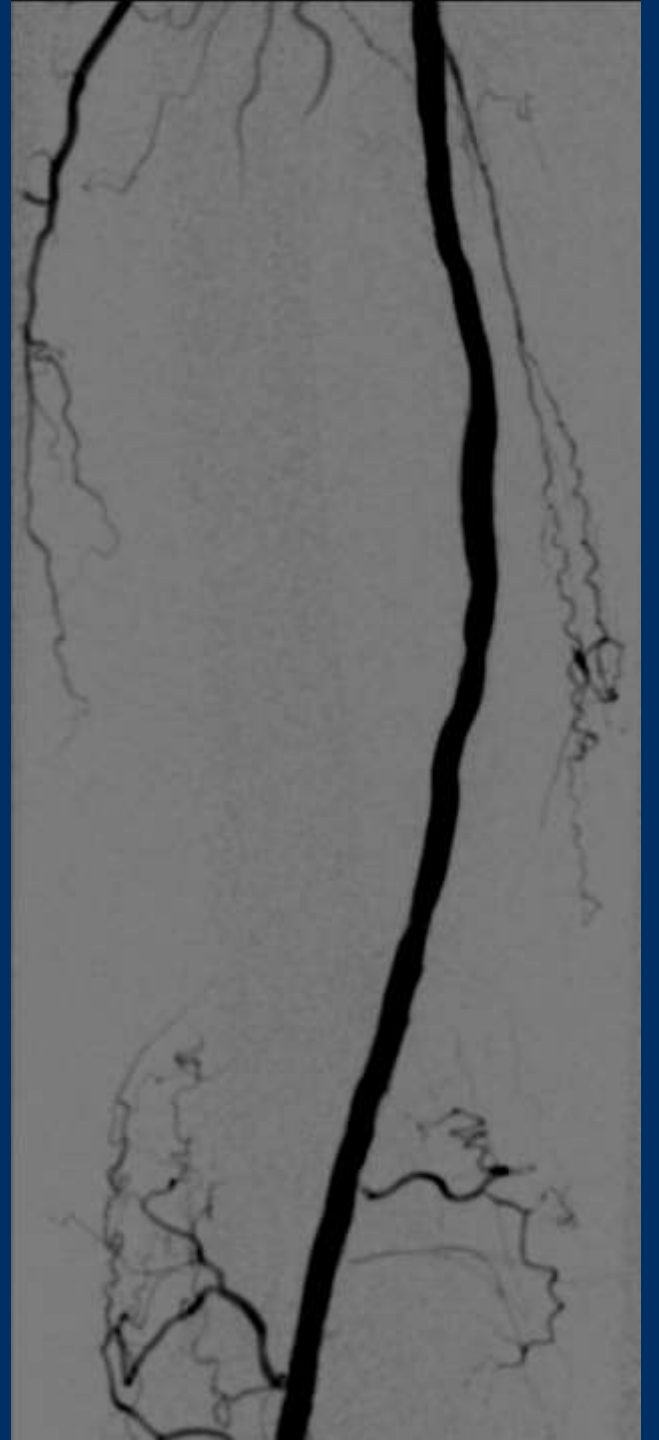
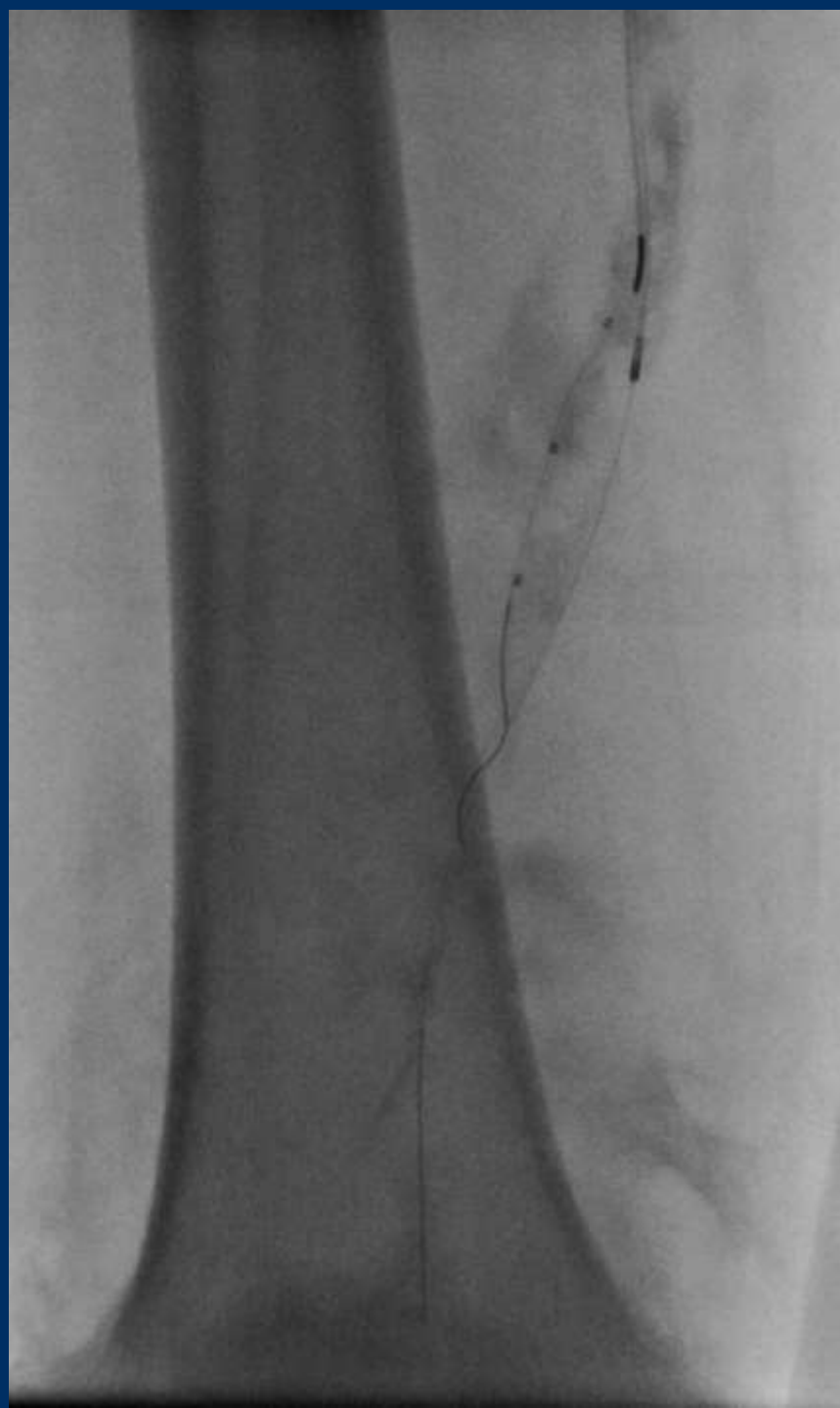
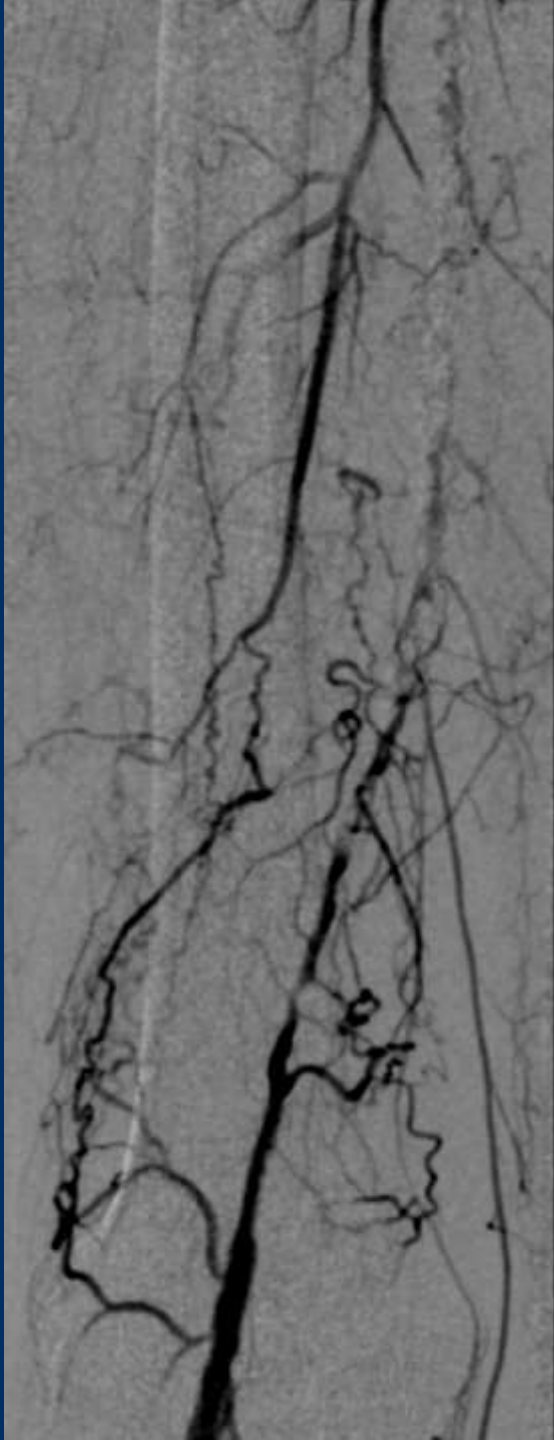
EA

DP



S-I: 2.1  
L-R: 149.5  
Roll: -1.3

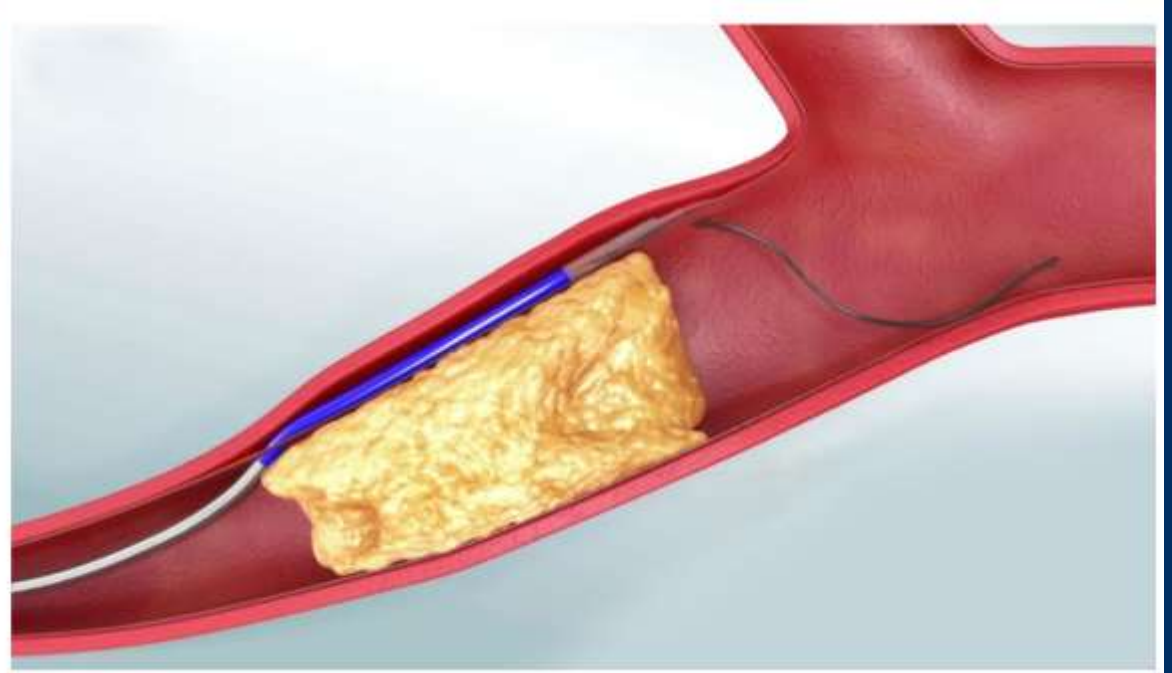
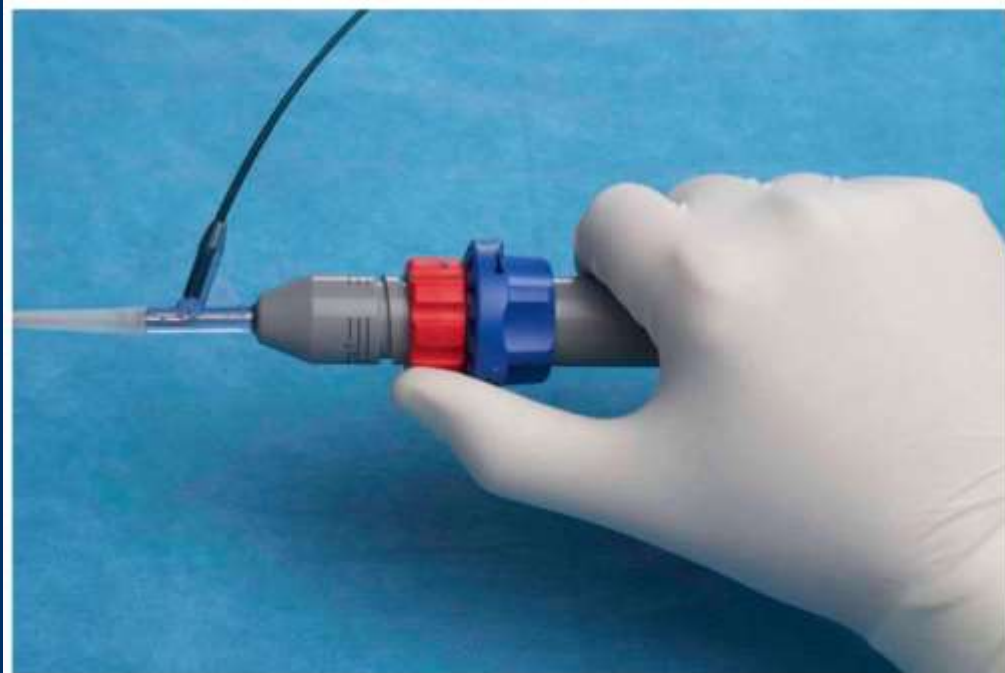




# Technical Tips



1. If the device doesn't track, pre-dilate sub-intimal tract – avoid damage the device



# Technical Tips



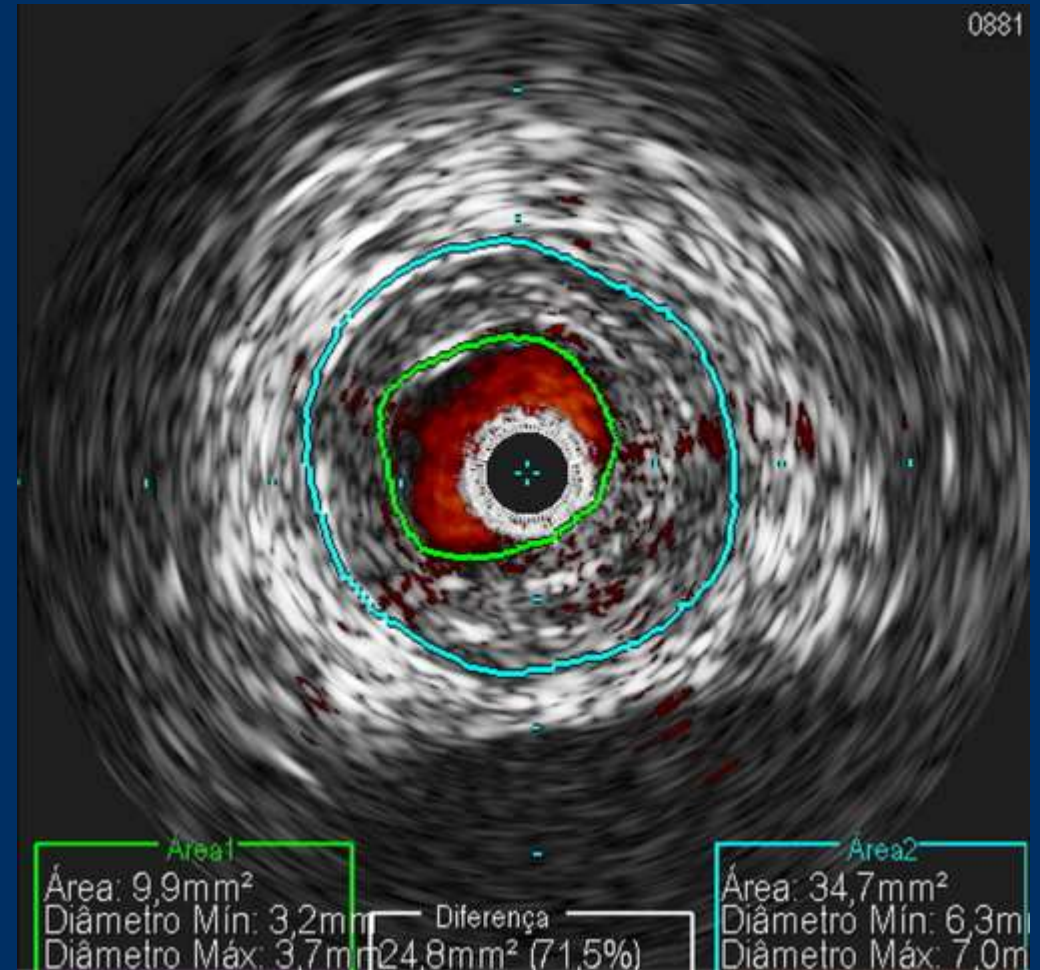
1. After re-entry, pre-dilate the track with a 3 mm balloon,
2. Change to a 0.035 support catheter and change the wire if a better support is needed;
3. Utilize IVUS after treatment to identify residual stenosis (re-entry point) and check Angioplasty results



# IVUS for PAD



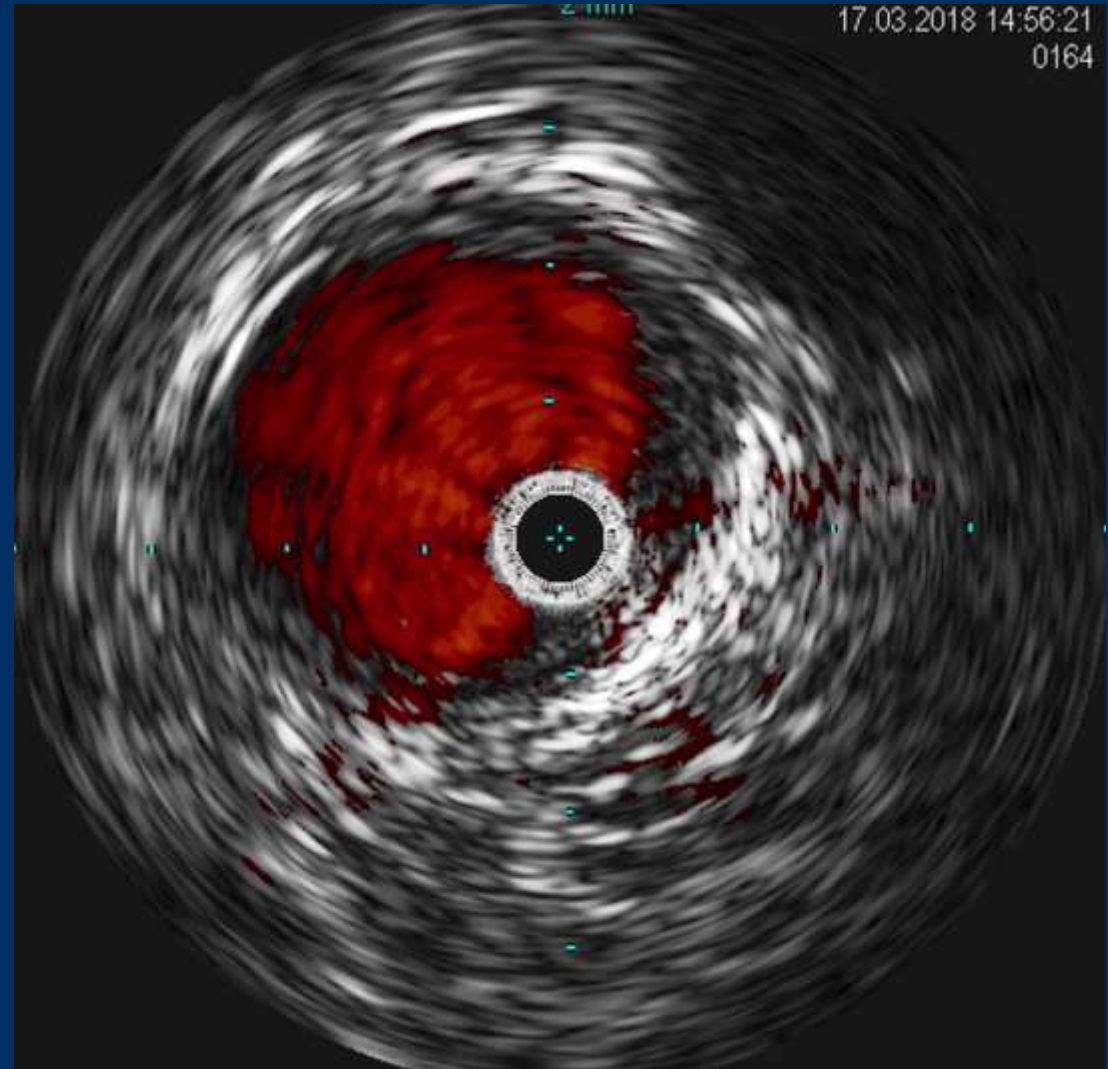
1. ChromaFlo
2. Vessel size
3. Plaque Morphology: fibrous, fibro-fatty, calcified
4. Plaque Geometry: Eccentric or concentric
5. Guidewire position: sub-intimal or true lumen



# IVUS for PAD



1. Detection of Calcium  
Severity:  
>270 degrees reduce effectiveness  
of DEB
2. Detection of Dissection
3. Detection of Thrombus
4. Stent sizing
5. Stent Apposition and  
expansion



# Summary – IVUS Pioneer Plus



1. Increase technical success for Sub-intimal angioplasty
2. Enable accuracy in re-entry points
3. Reduce procedure time
4. Reduce contrast
5. Fast learning curve

# Conclusions



1. Pioneer Plus is our first line re-entry device
2. Use complementary IVUS for Angioplasty and Stenting



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