Minimize Residual Plaque

Atherectomy

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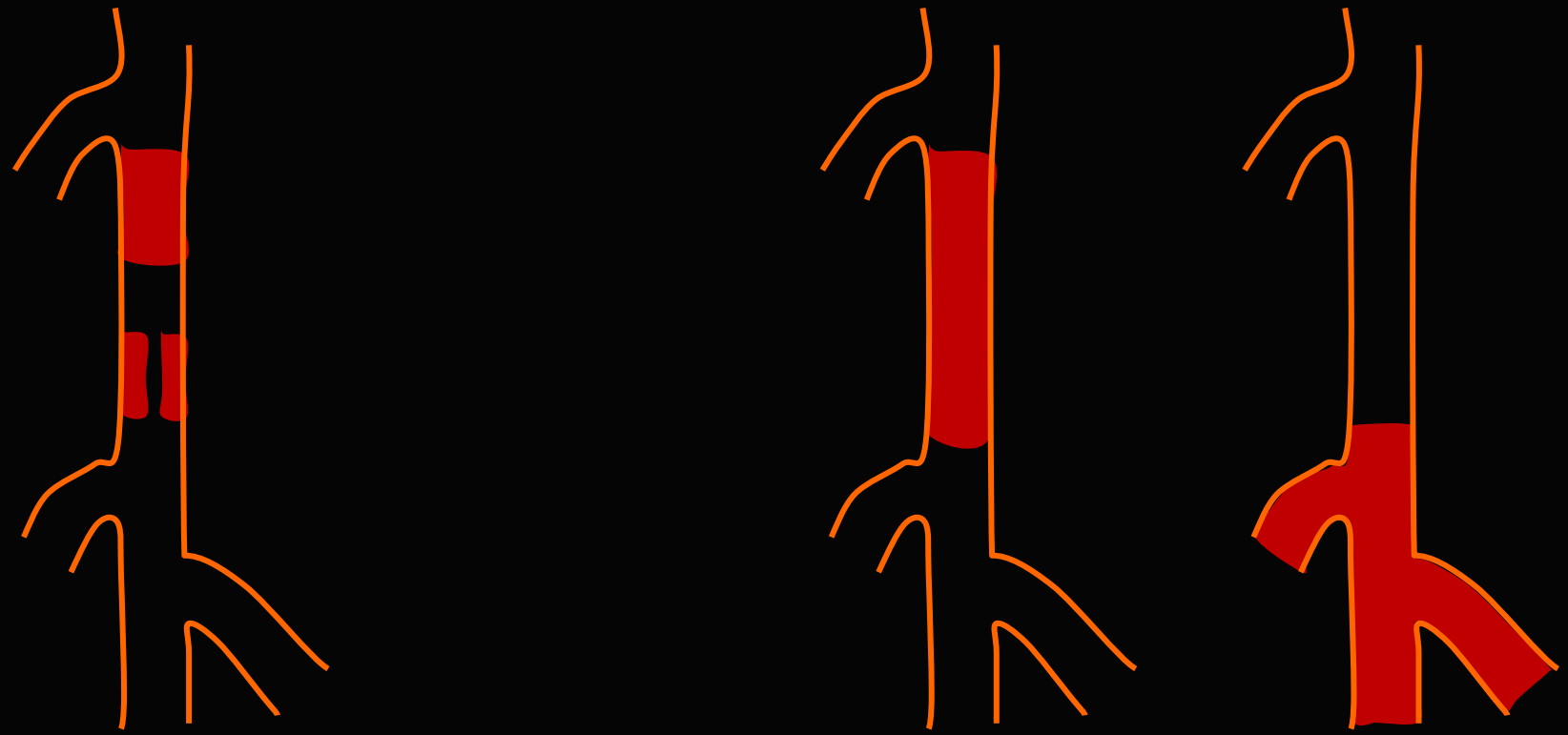
TASC II Classification

Femoropopliteal Disease – Type C/D Lesions



+ Failure of endovascular treatment

Treatment Options for TASC II C/D FP Disease

- Balloon PTA alone
- BMS
- Atherectomy
  - Directional / Rotational
- *Drug-coated balloons*
- *Atherectomy + DEB*

→ Nothing behind

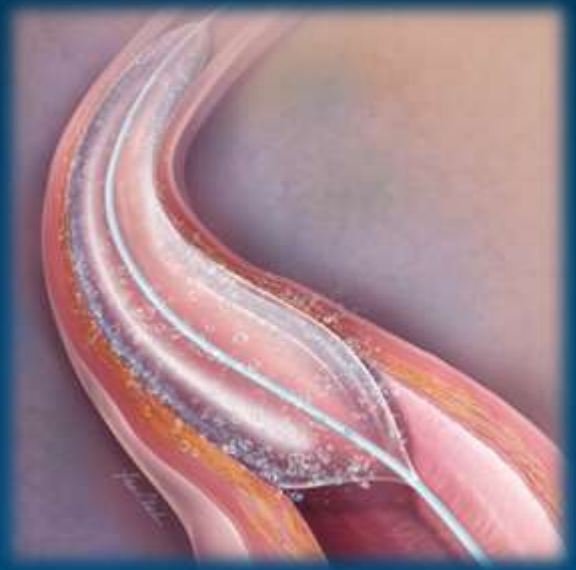
- *Drug-coated stents*
- *Interwoven nitinol stent*
- Graft stent

.....

Limitation of DEB for TASC II C/D FP Disease

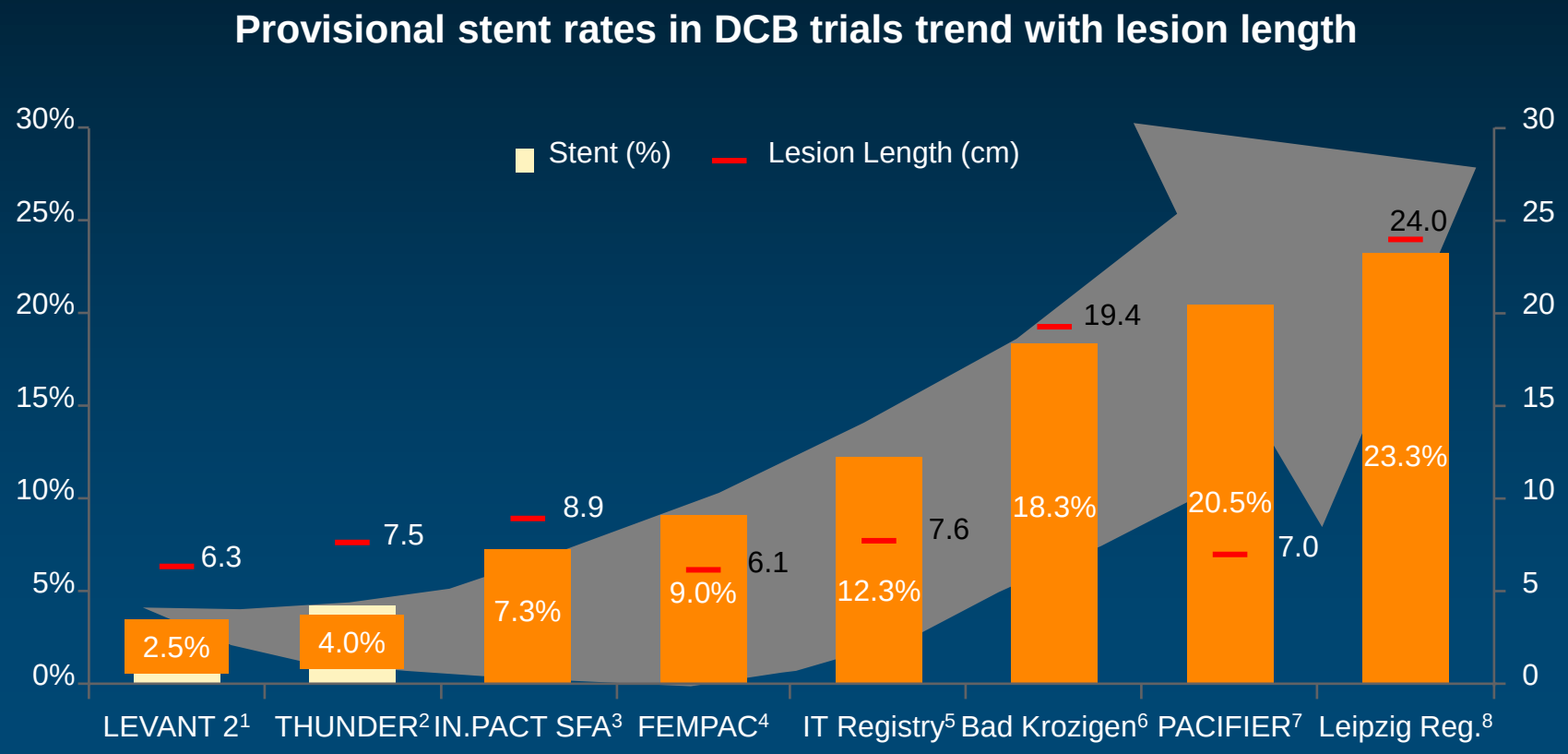
Just a balloon itselt…

- **Smaller lumen gain**
- **Elastic recoil**
- **Dissection and Acute closure**
- **Low drug efficiency for heavily calcified lesion**



DCB and Provisional Stenting

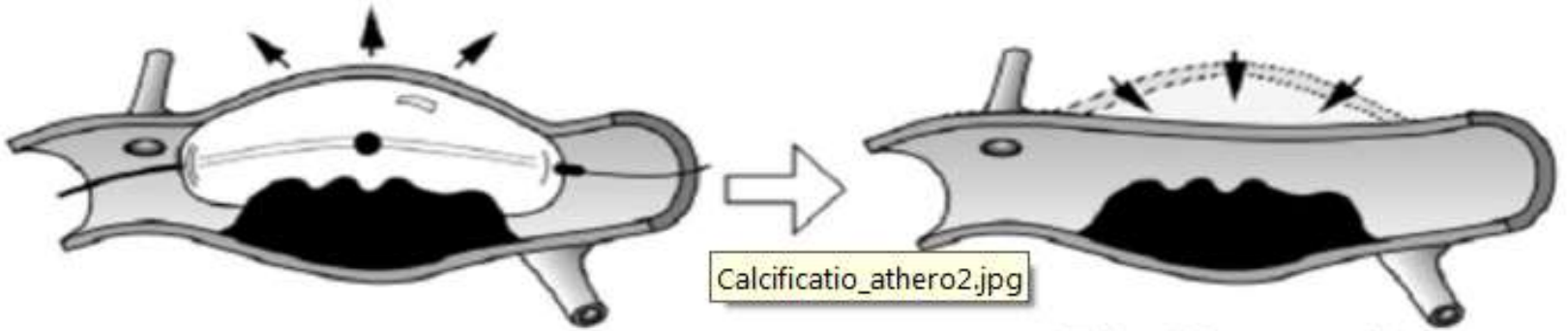
Scaffolds still needed, likely at rates proportional to lesion complexity



1. Rosenfield K TCT 2013; 2. Tepe G et al. *N Engl J Med*. 2008; 3. Tepe CX 2014; 4. Werk M et al. *Circulation*. 2008; 5. Micari A et al. *J Am Coll Cardiol Intv*. 2012; 6. Zeller T CX 2013 oral presentation; 7. Werk et al. *Circ Cardiovasc Interv*. 2012; 8. Schmidt A LINC 2013 oral presentation

Calcium Limits Vessel Expansion

Significant difference in vessel compliance leads to overstretch in non-diseased tissue causing dissections, recoil, excessive injury, and poor outcomes



Fully inflated balloon

Elastic recoil

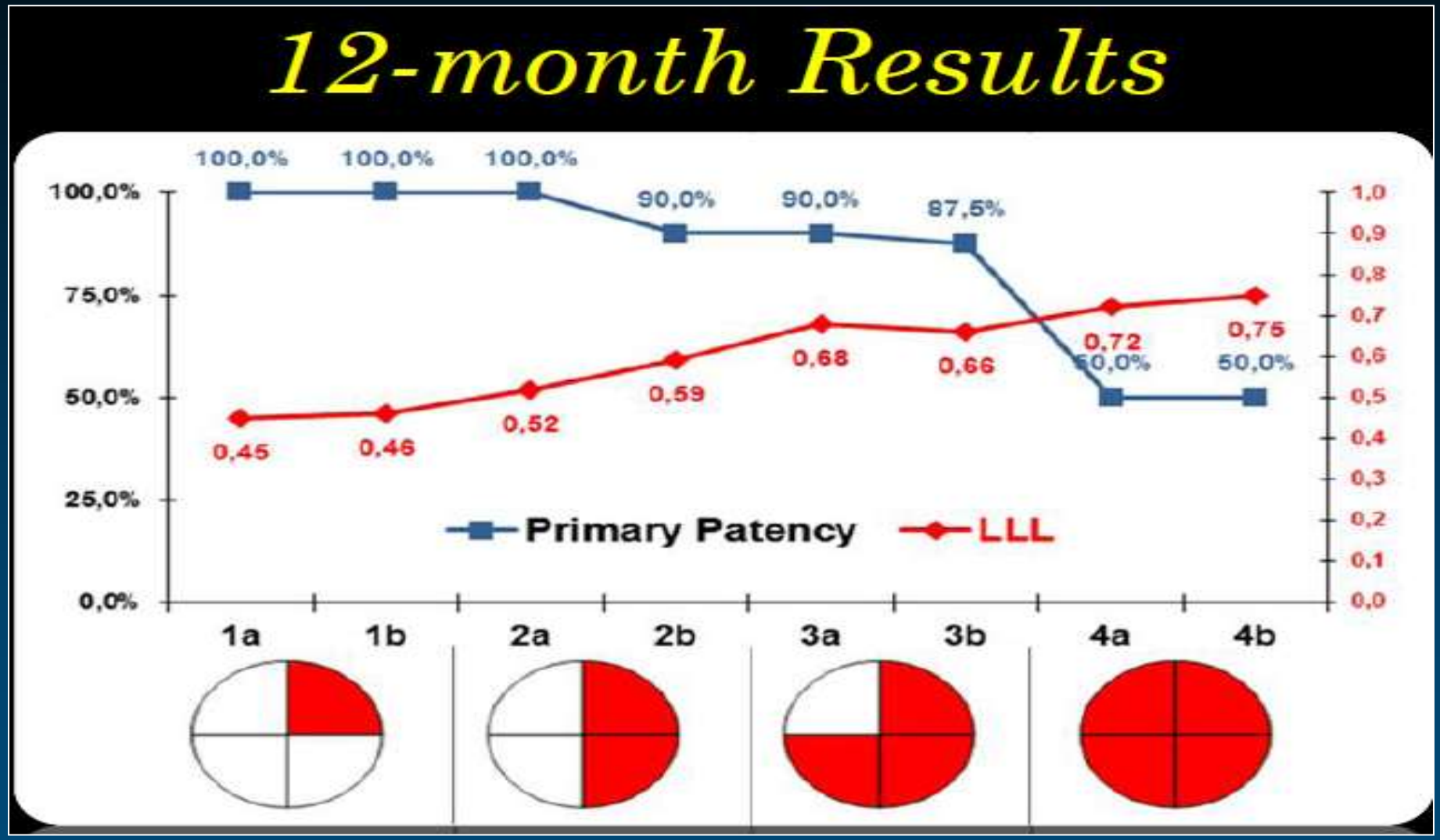
Residual, high-grade stenosis

Figure 12.1. Elastic Recoil After PTCA of Calcified Lesions

Rather than cracking the hard, calcified atheroma, PTCA causes stretching of the contralateral plaque-free wall segment and ineffective dilatation.

Freed MS, Safian RD; Manual of Interventional Cardiology, Ch. 12, 245-254

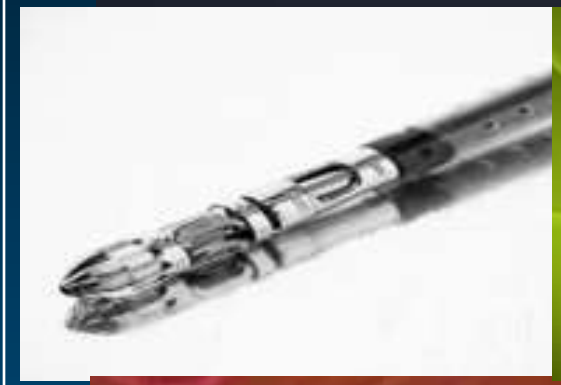
Calcium May Limit Drug Effect

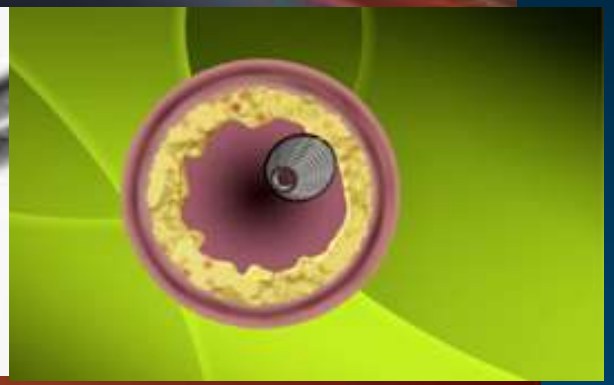


1. Fanelli J Endovas Ther 2012;19:571-580. 2. Fanelli et al. Cardiovasc Intervent Radiol (2014) 37:898-907)

Atherectomy

- Directional
  - TurboHawk
- Rotational
  - Pathway
- Orbital
  - Diamondback
- Athero-ablative
  - Laser

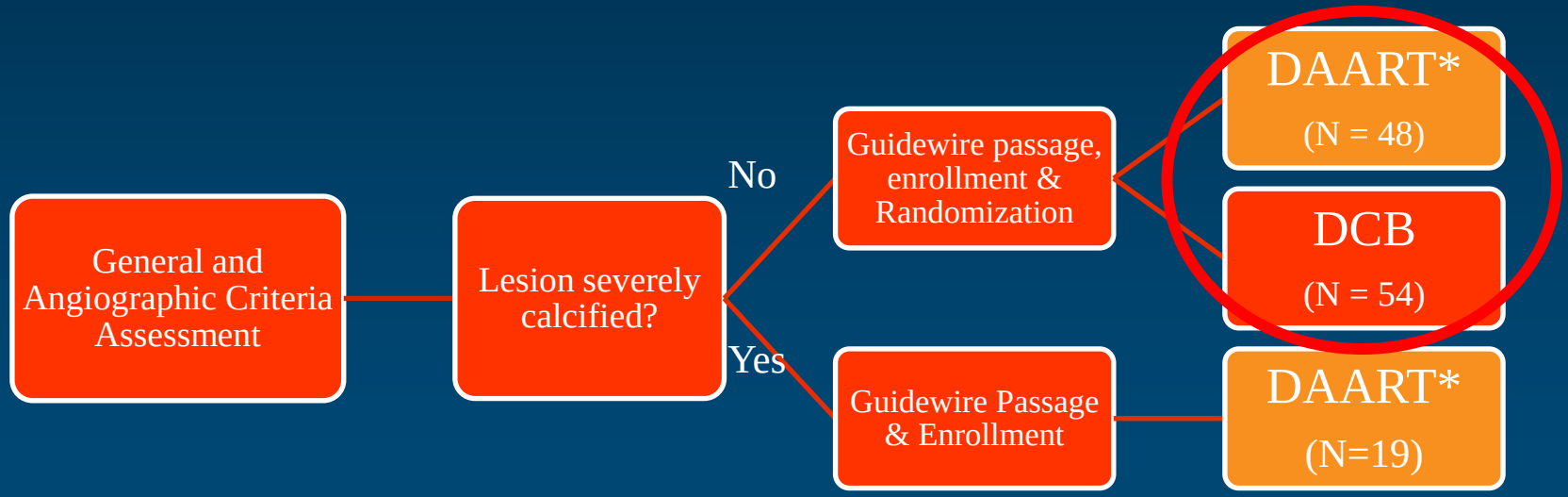




DEFINITIVE AR Study Design

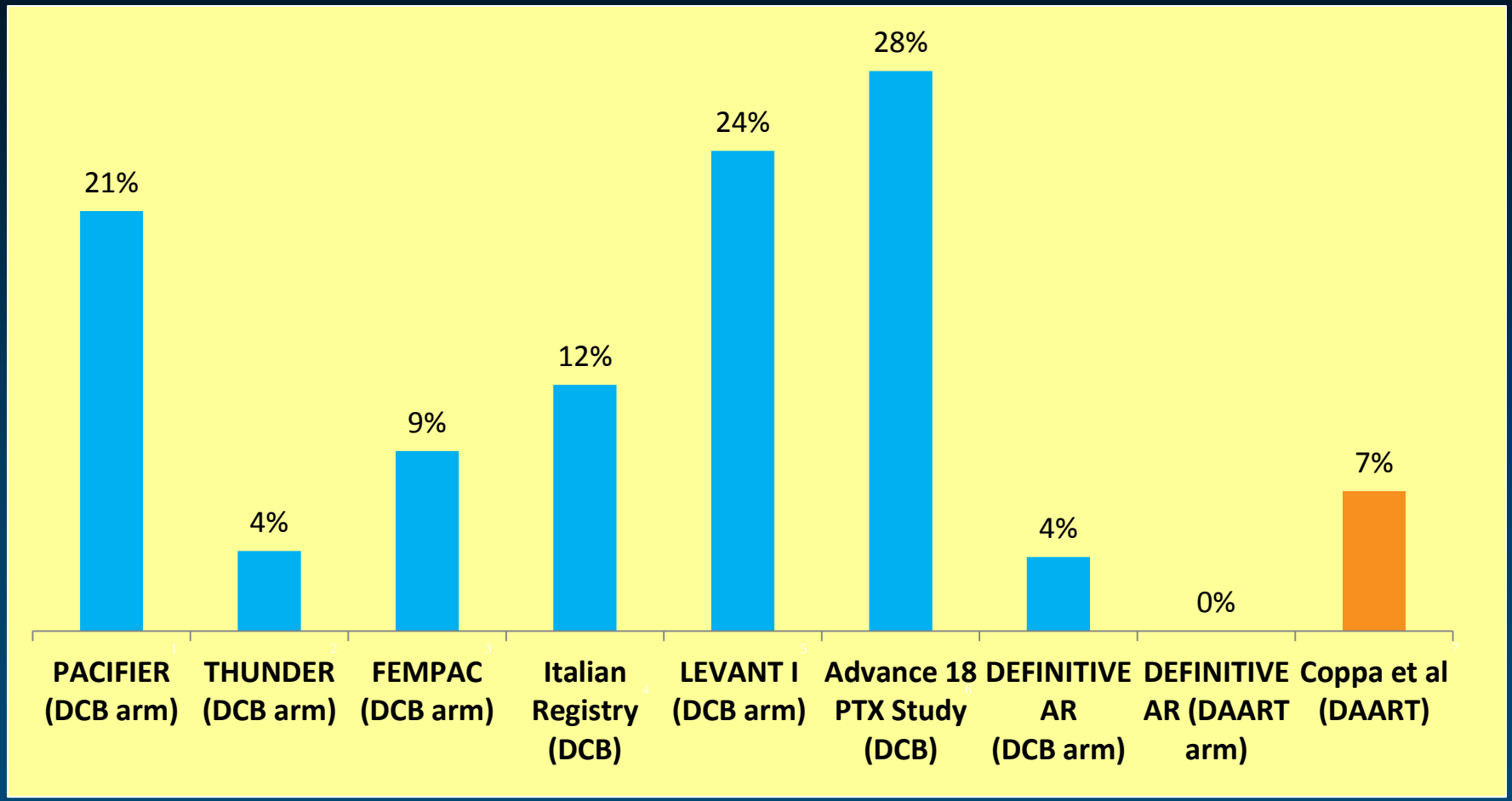
Purpose: assess and estimate the effect of treating a vessel with directional atherectomy + DCB (DAART) compared to treatment with DCB alone

Registry arm for severely calcified lesions created to limit bail-out stenting (and therefore variables) in randomized arm.



* **D**irectional **A**therectomy + **A**nti-**R**estenotic **T**herapy

Fewer stents placed with DAART procedure vs. DCB



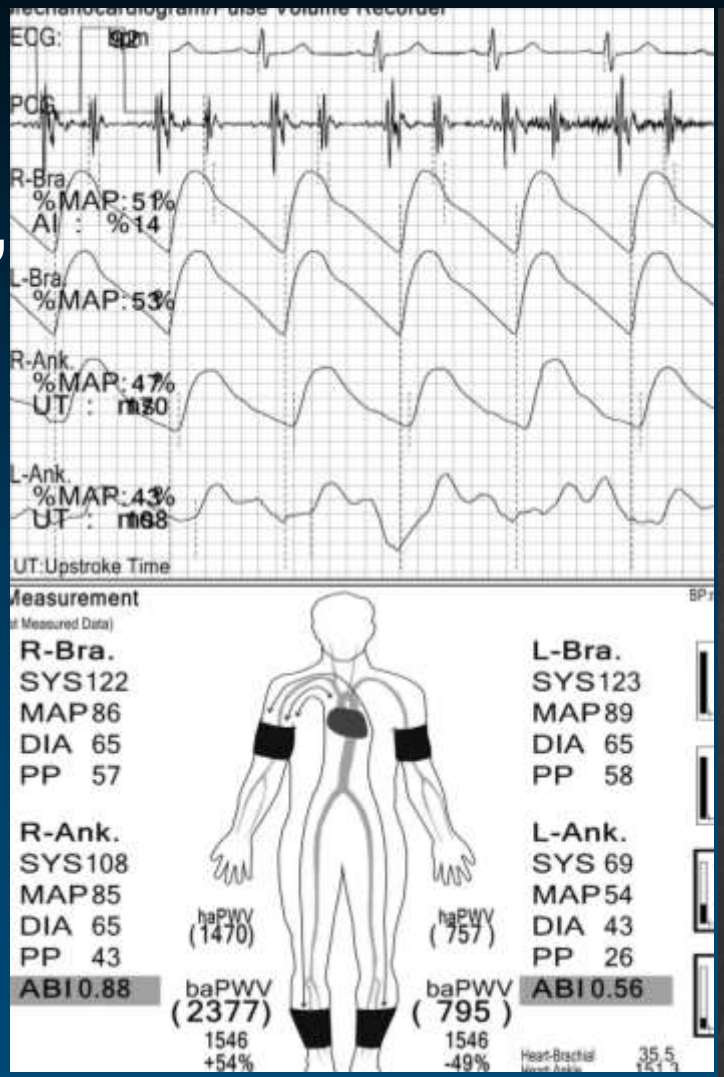
1. Werk, M., et al., Circ Cardiovasc Interv, 2012. 5(6): p. 831-40.
2. Tepe, G., et al., N Engl J Med, 2008. 358(7): p. 689-99.
3. Werk, M., et al., Circulation, 2008. 118(13): p. 1358-65
4. Micari, A., et al., JACC Cardiovasc Interv, 2012. 5(3): p. 331-8.
5. Scheinert, D., 56 Month Reesults of the LEVANT I Trial. *TCT*. 2010. Washington, DC
6. Scheinert, Advance 18 PTX Study 6 Month Resutls. LINC 2013 , Leipzig, Germany
7. Cioppa, A., et al.,Cardiovasc Revasc Med, 2012.

Complicated SFA Intervention

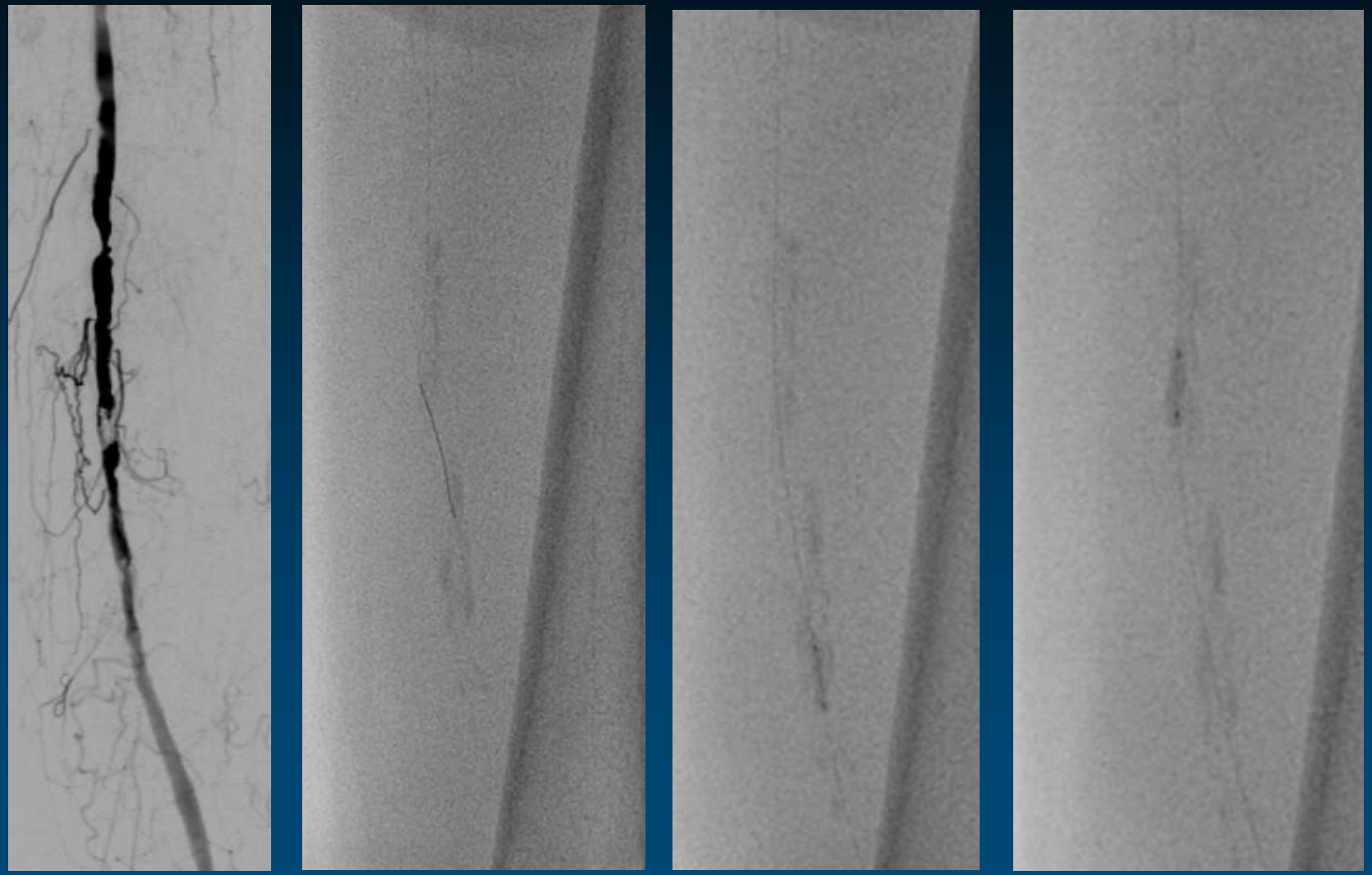
- **Long SFA CTO**
- Flush occlusion (stumpless ostial occlusion)
- Iliac CTO extended to SFA
- **Heavy calcification**
- **In-stent total occlusion**
- **Bending zone stenosis (CFA and Popliteal)**
- SFA CTO extended to popliteal artery
- Distal popliteal occlusion extending into origin of all tibial vessels
- **Acute limb ischemia with thrombus**
- Previous failure of endovascular treatment

Case

- M / 76
- DM, HTN
- Left calf claudication,
  Rutherford 3
- 2VD
  → medical treatment



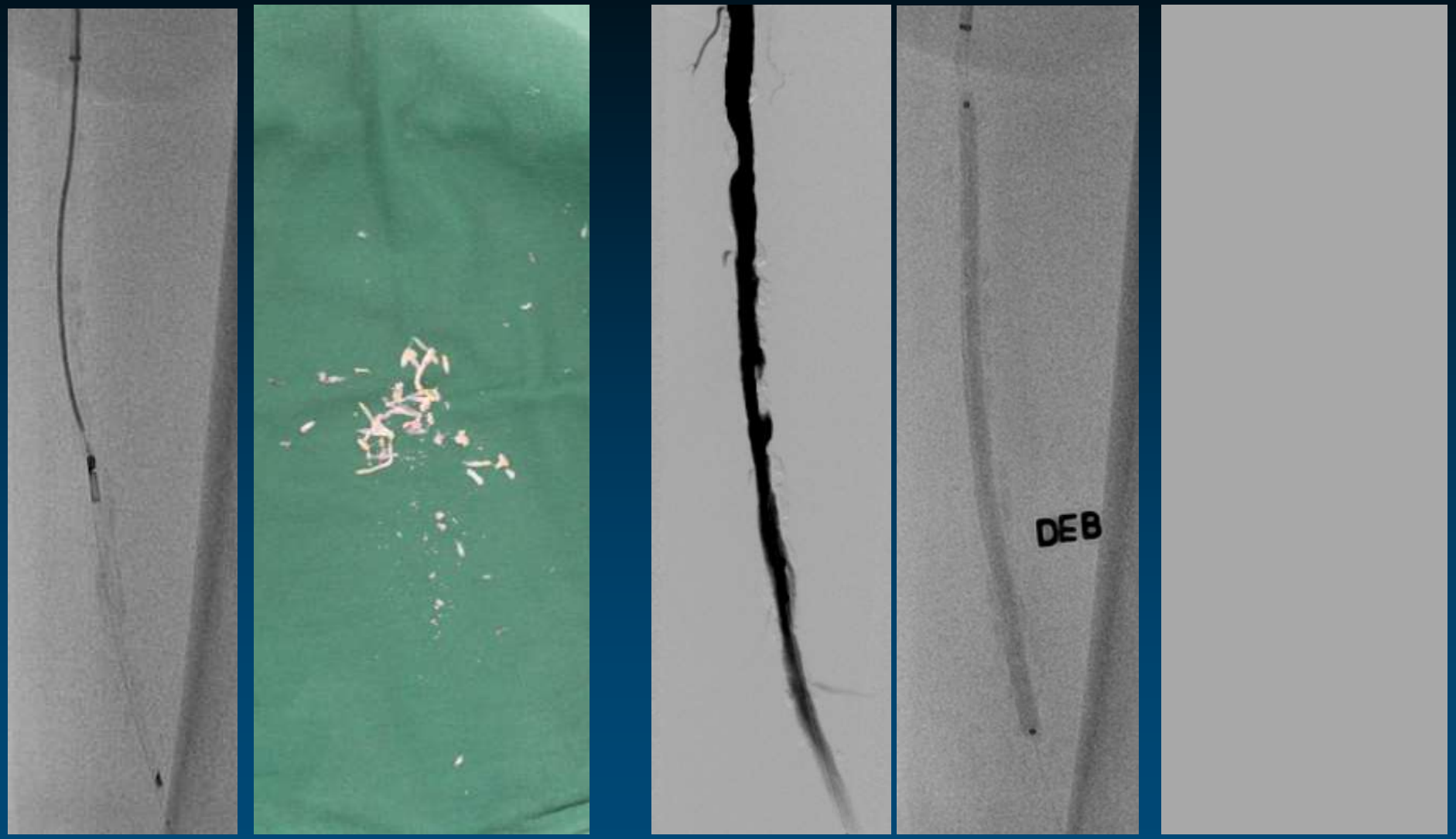
mSFA calcific severe stenosis



Calcified mSFA stenosis

3.0 mm balloon

DAART



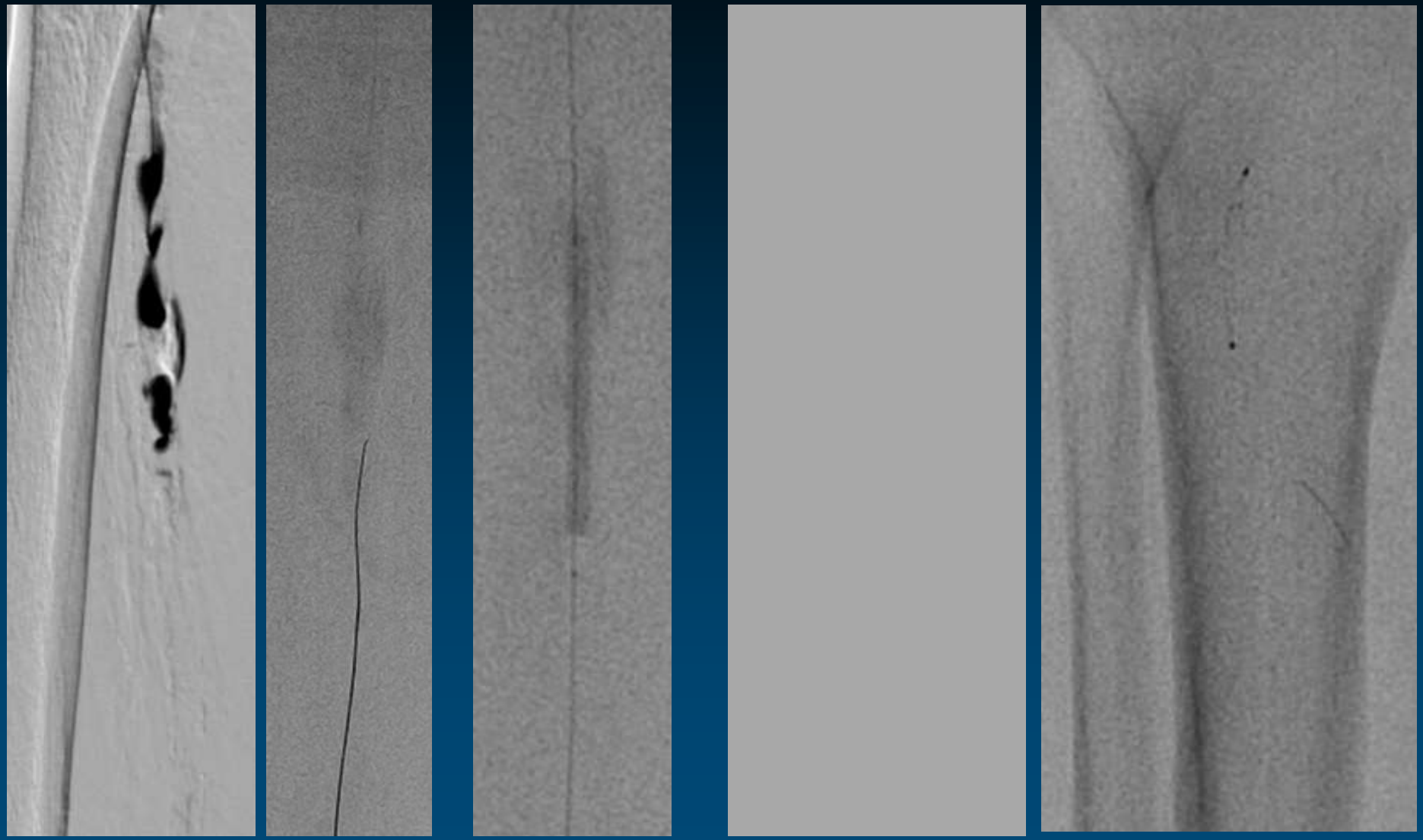
LX-C 5.0x150mm DCB Final

Case

- M / 63
- DM, HTN, Smoking
- ESRD on HD, 2VD
- Right 4th toe ulcer

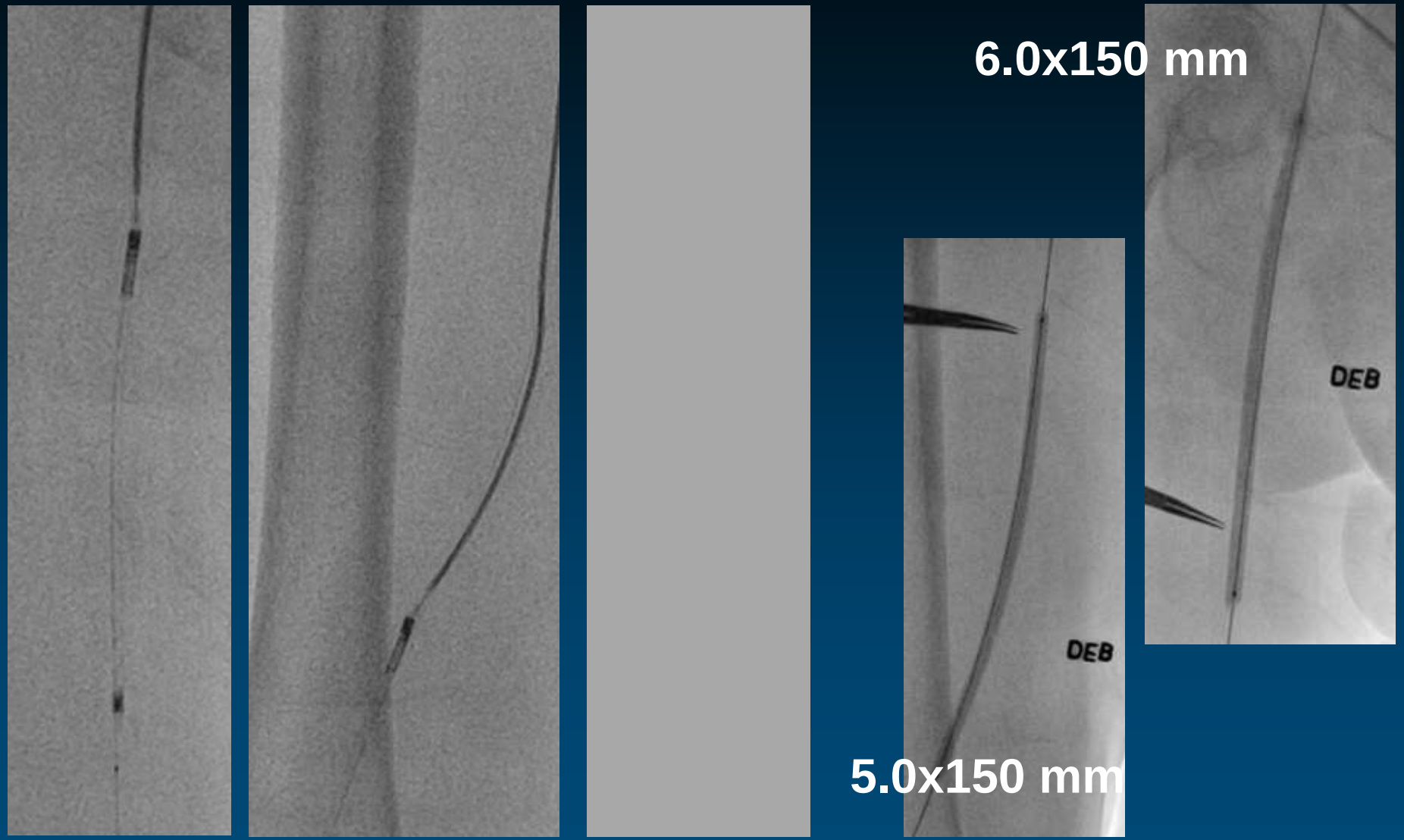
SFA CTO & Single Peroneal Line

Retrograde Access from dSFA



Bidirectional | 3.0 mm | Post-PTA | Filter in P3

DAART



LX-C

DCB

DAART

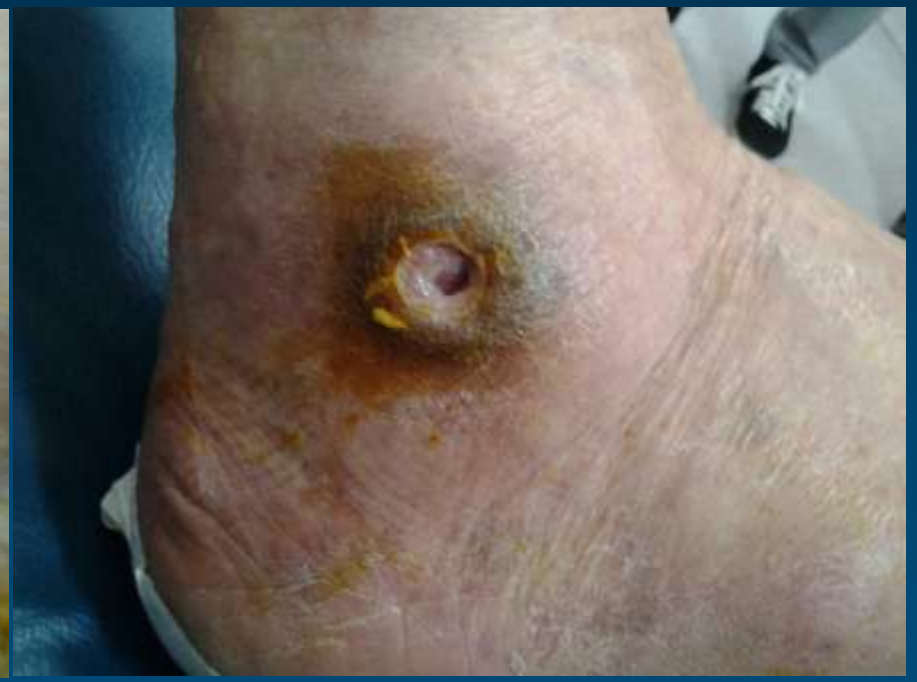
Retrograde ATA intervention

Before

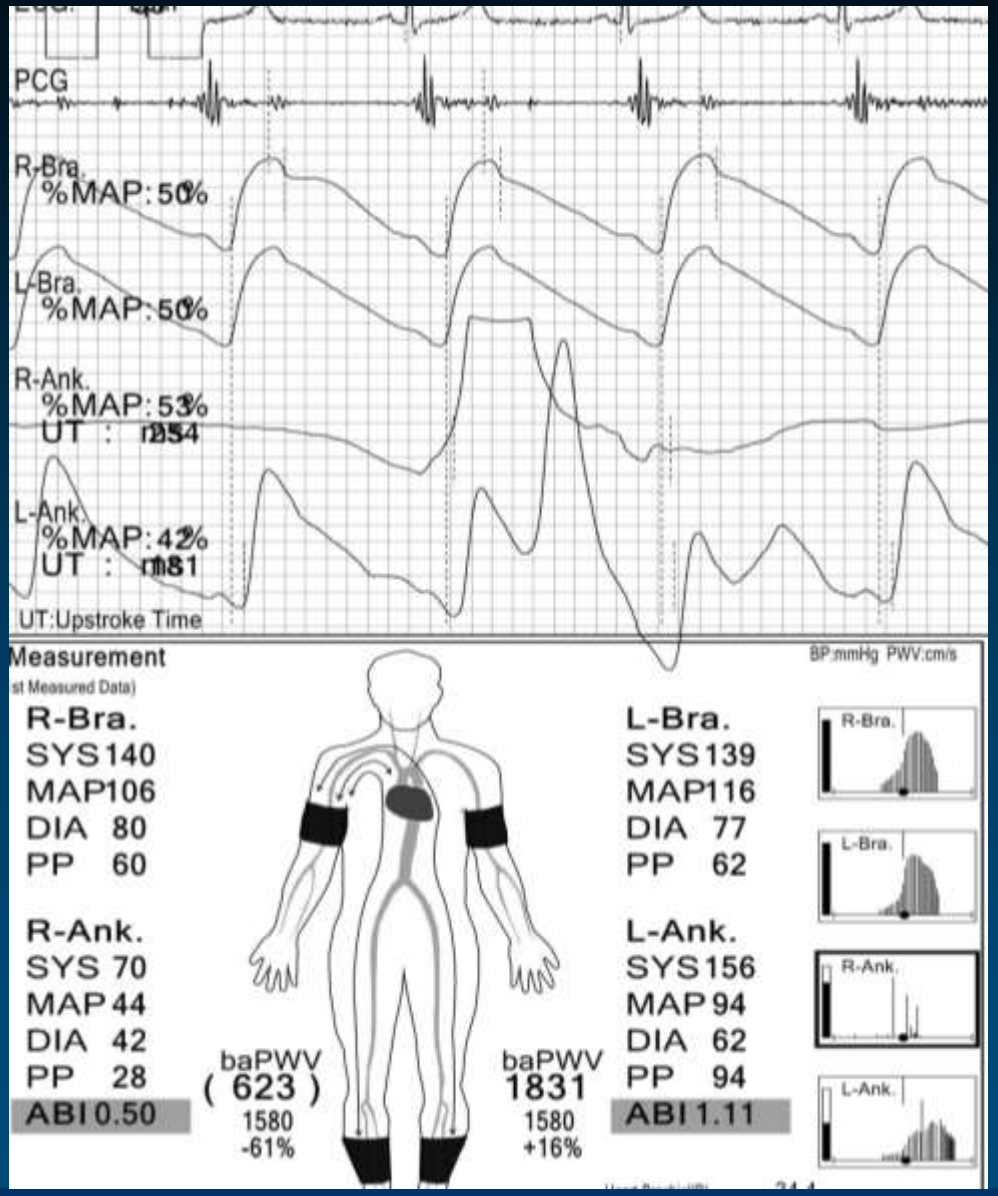
After

Case

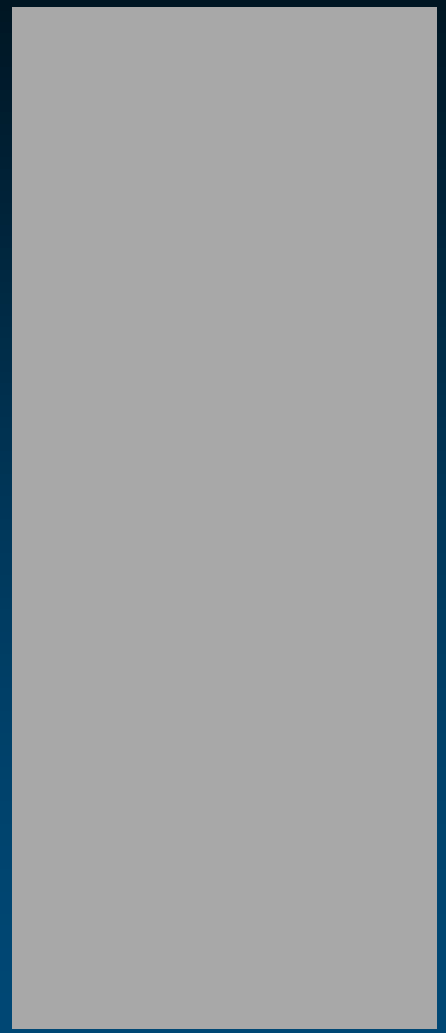
- M / 79
- DM (-), HTN (-), Exsmoker
- Right lateral malleolar ulcer for 2 months
- Right 4-5th web ulcer for 1 month
- Absent right popliteal and pedal pulse

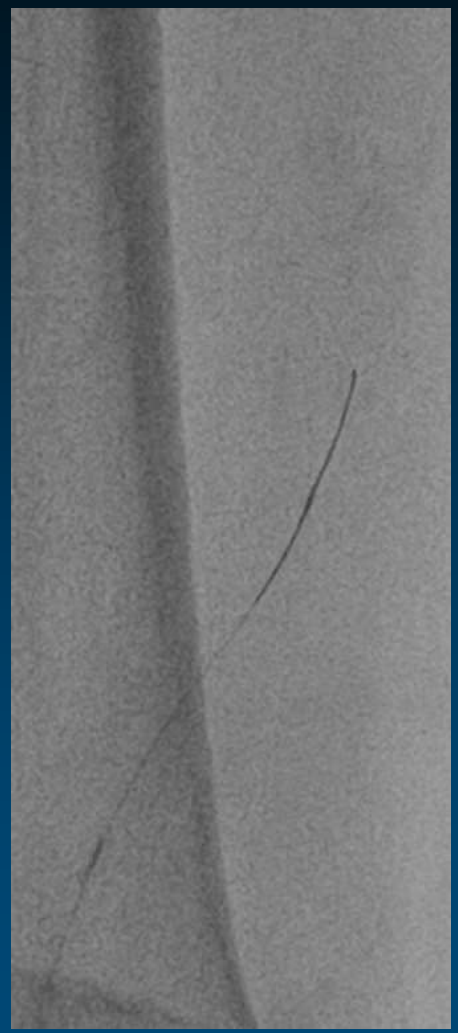


ABI & CT angiogram



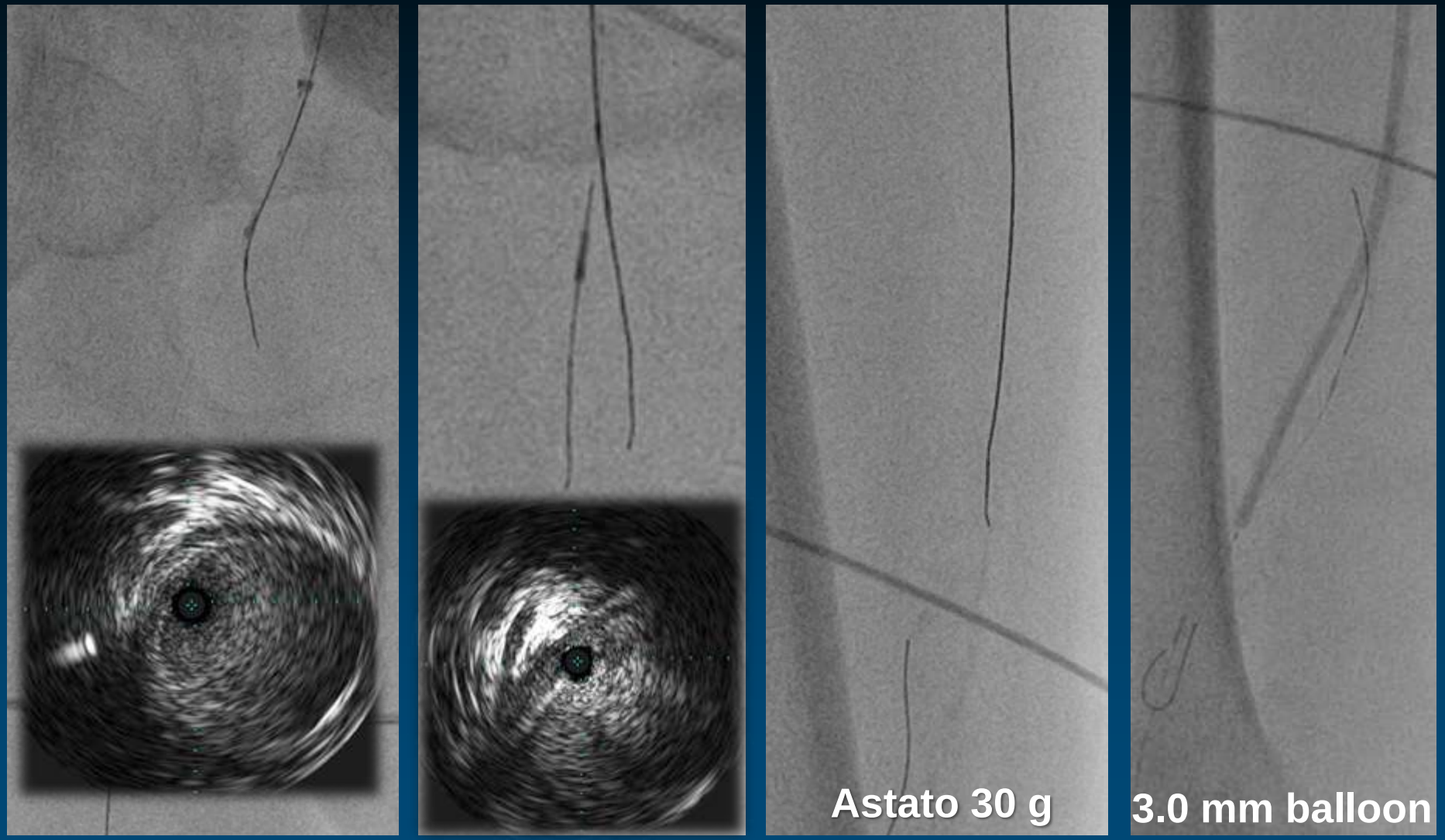
Flush SFA – Pop Occlusion





Retrograde ATA access

IVUS-assisted parallel wiring

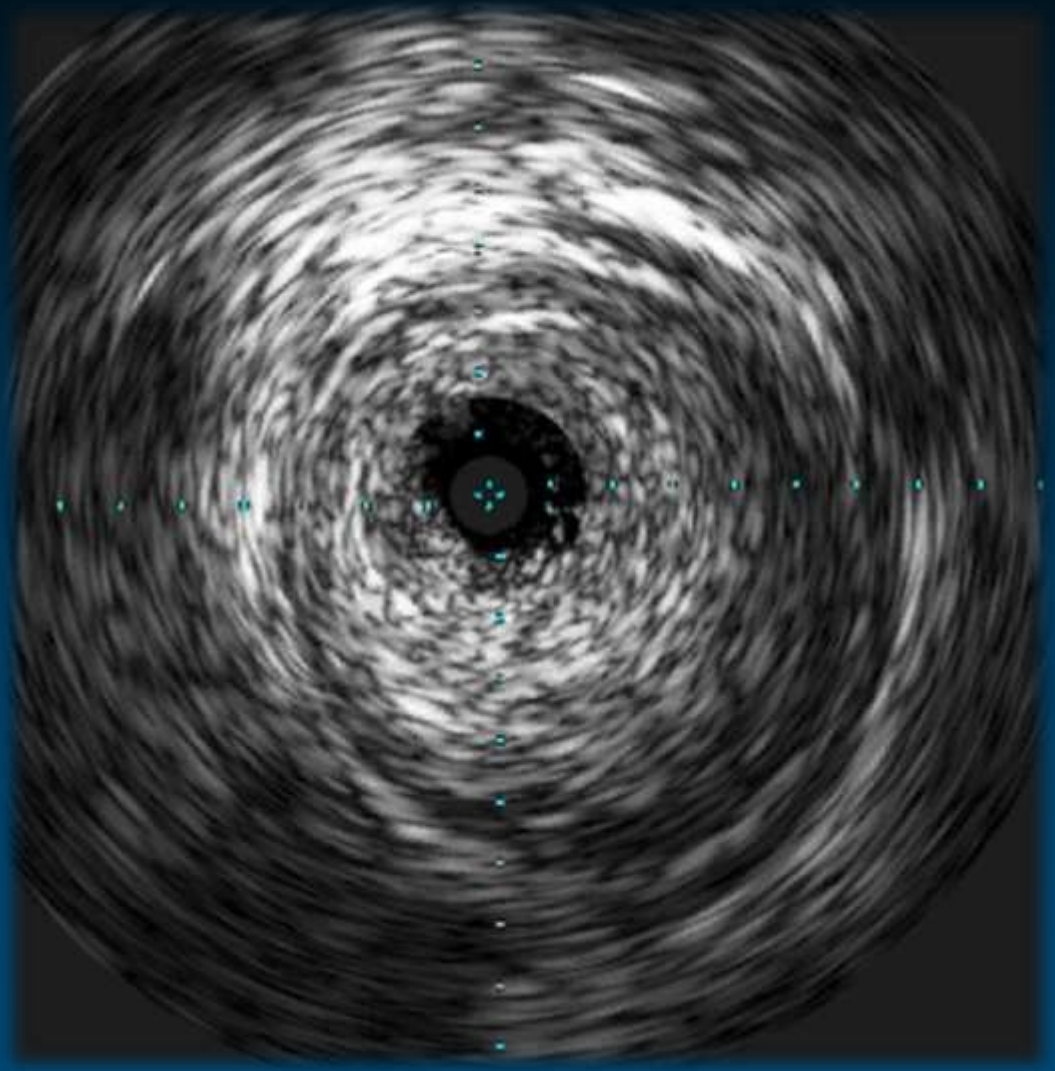


IVUS assisted ostial digging and parallel wiring

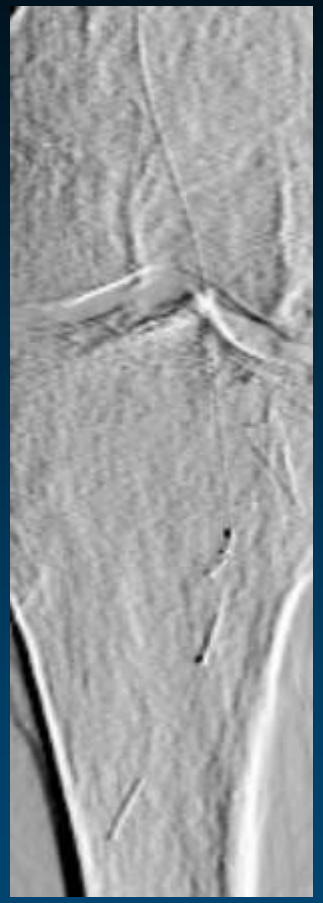
IVUS-assisted R-CART

3.0x150 mm balloon

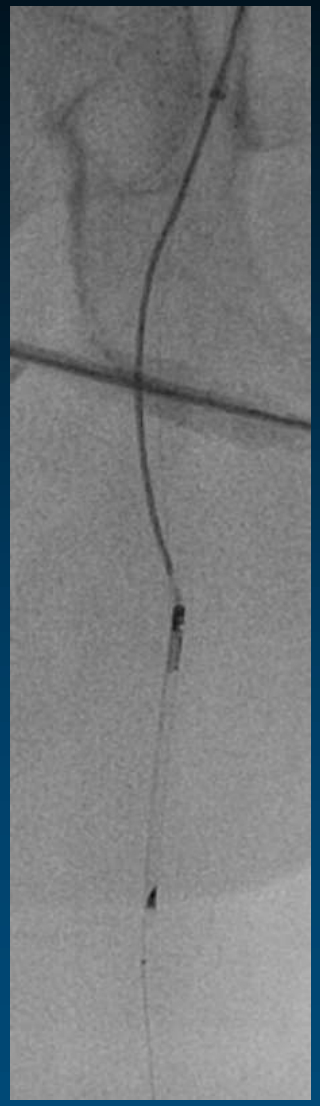
Intraluminal Passage on IVUS

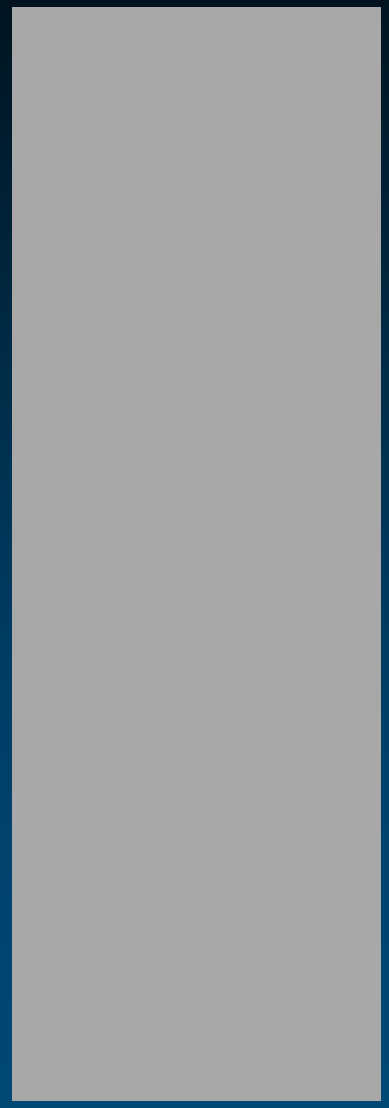


Turbohawk LS-C



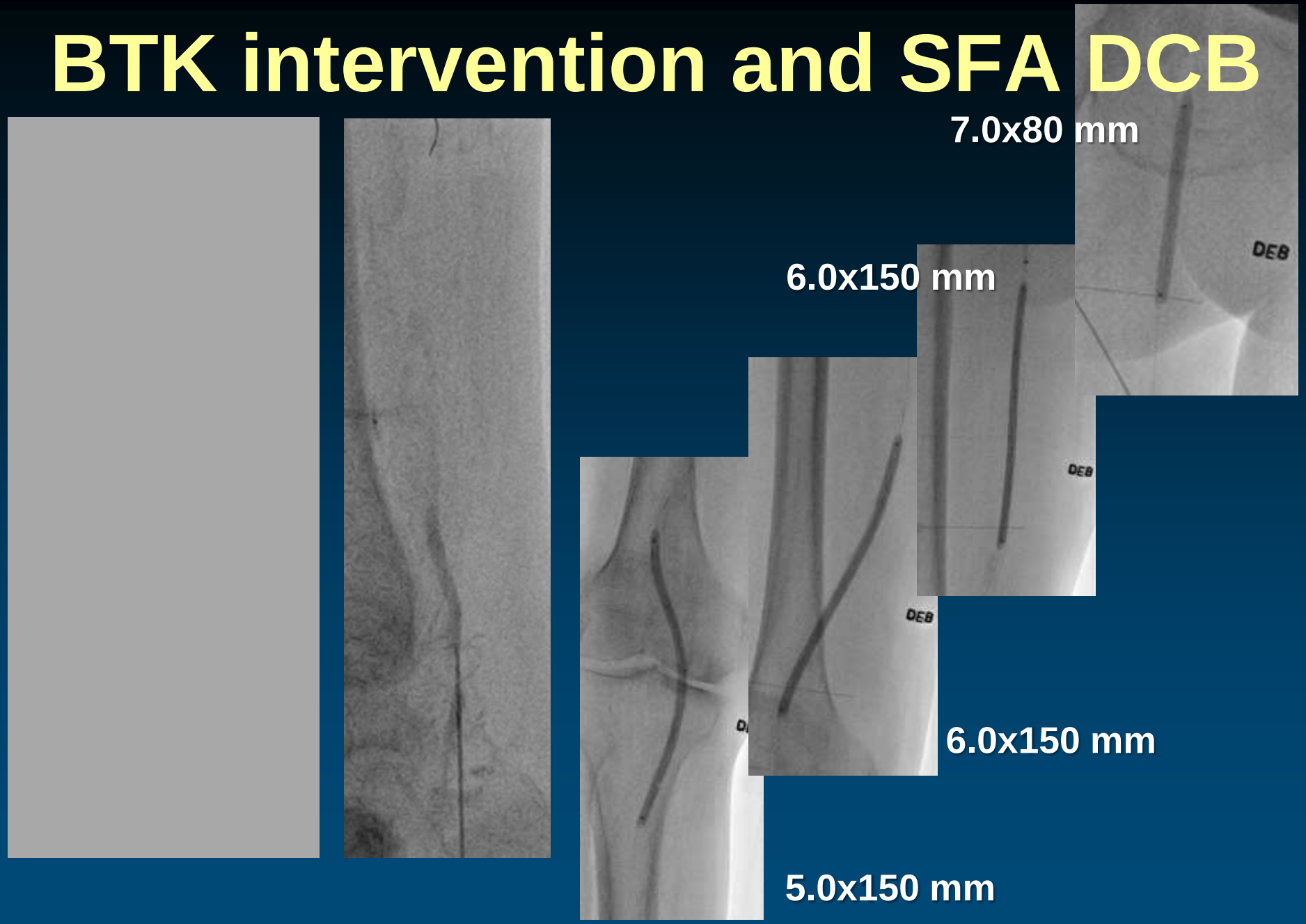
Filter



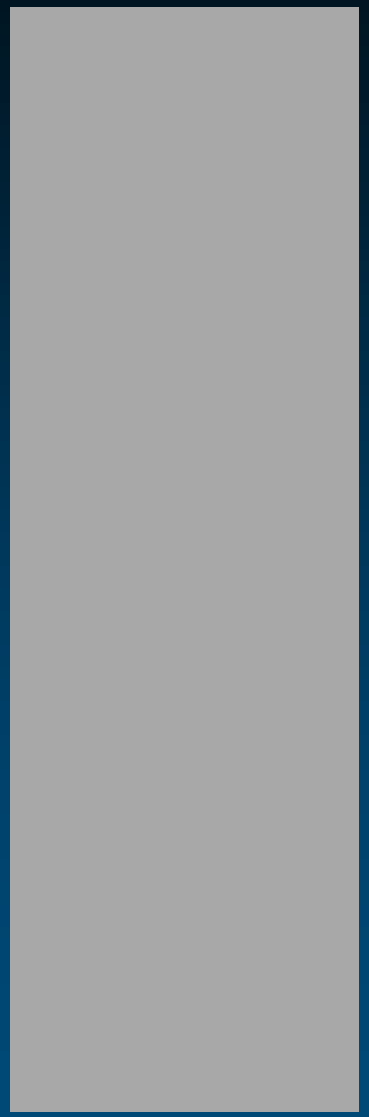


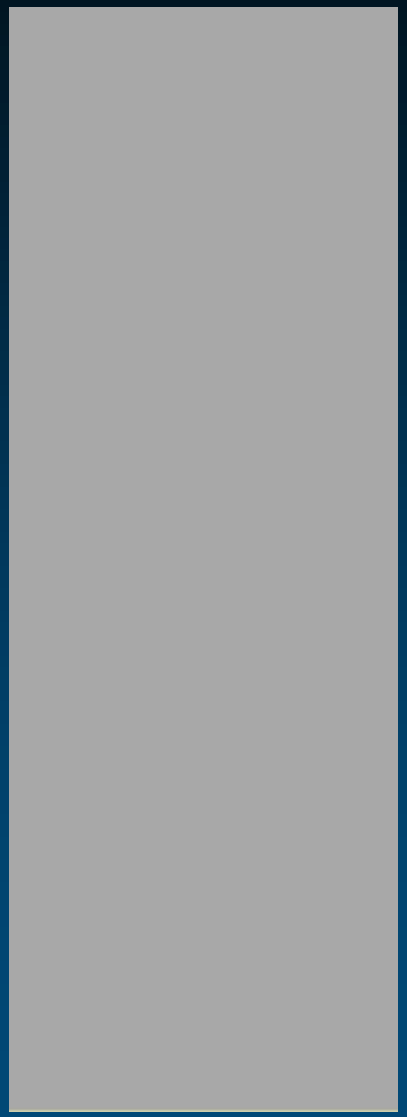
After Atherectomy

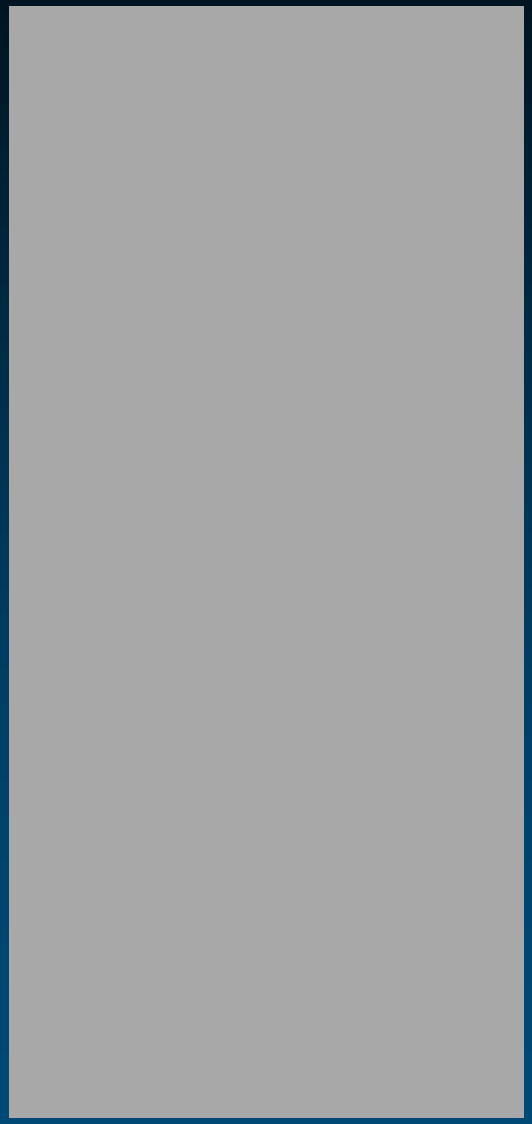
BTK intervention and SFA DCB



Final Angiogram

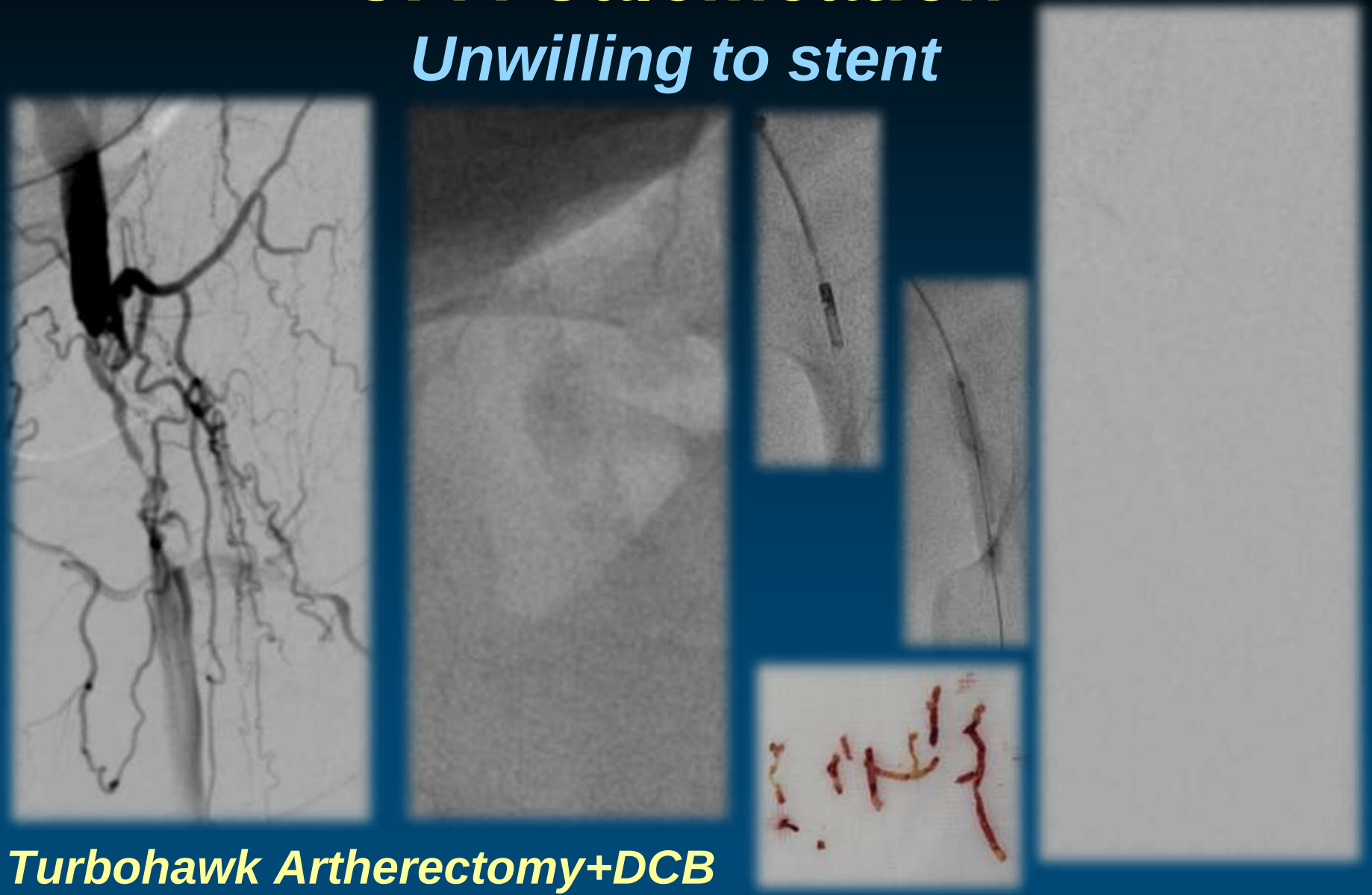






CFA Calcification

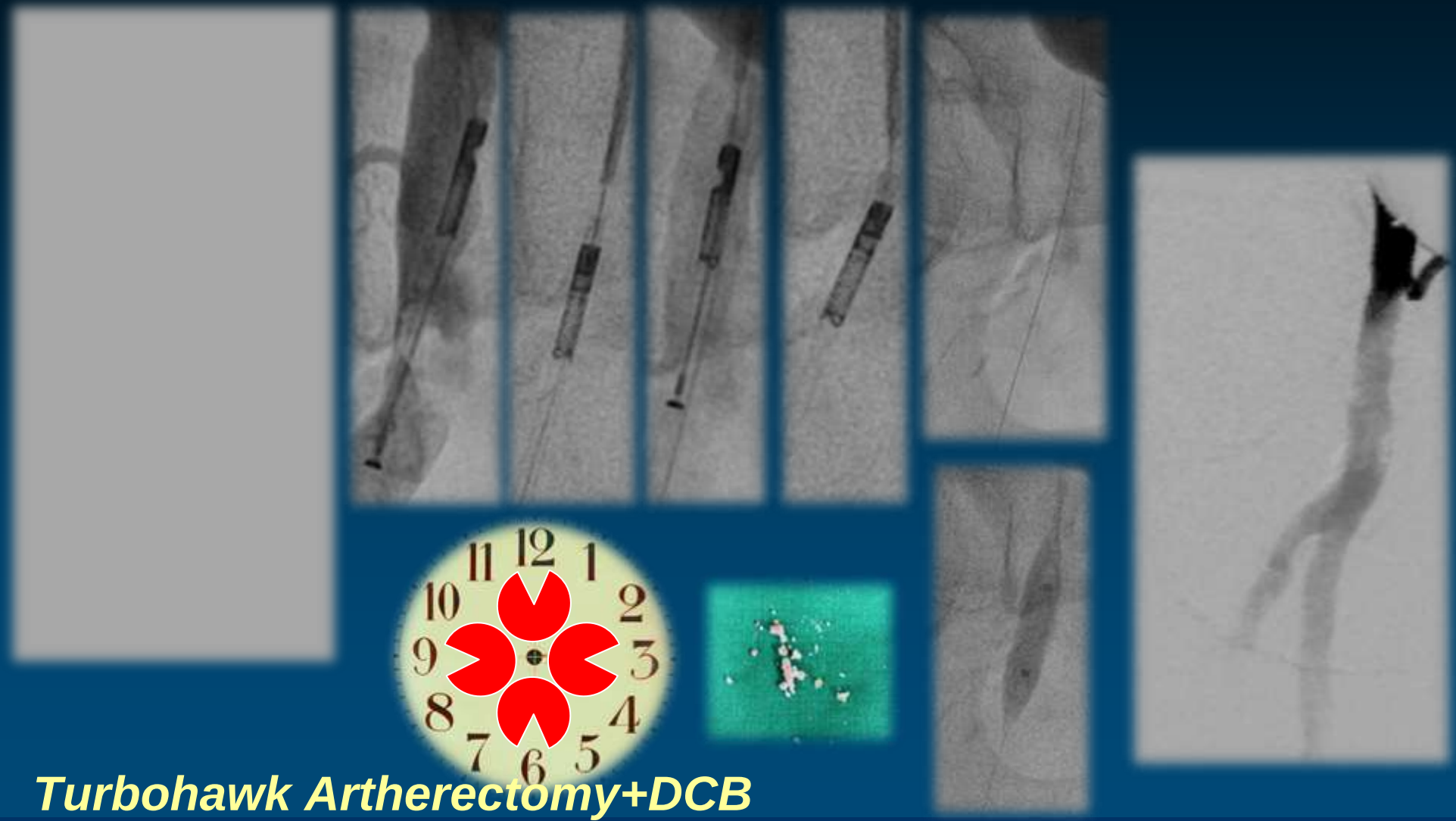
Unwilling to stent



Turbohawk Artherectomy+DCB

CFA Calcification

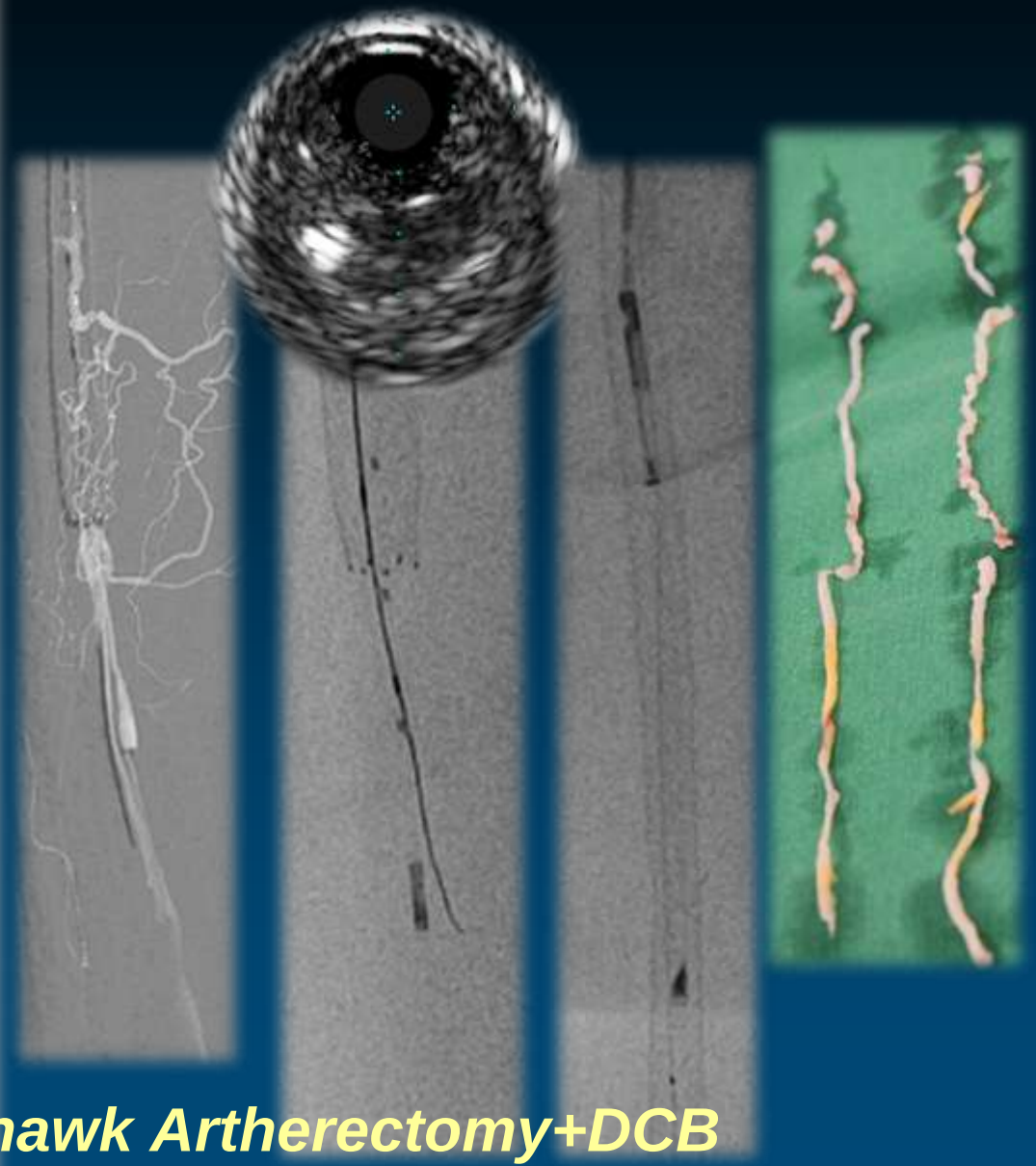
Unwilling to stent



Turbohawk Artherectomy+DCB

In-Stent Restenosis

DAART for ISR



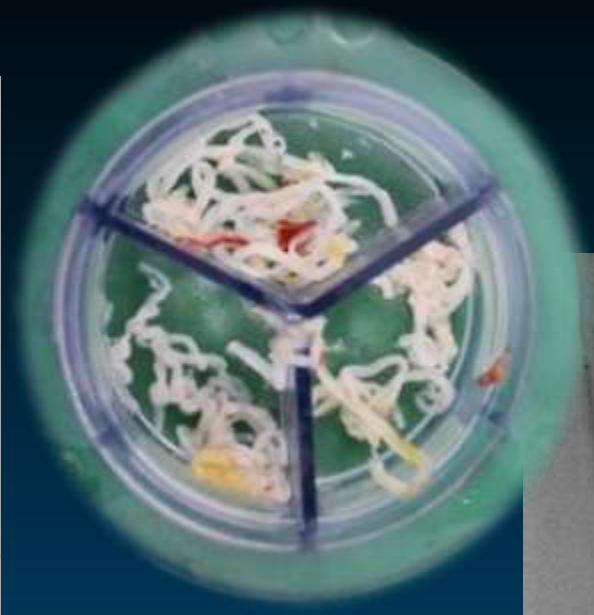
Turbohawk Artherectomy+DCB

M/69, DM
Both L/E Rutherford 3 claudication

S/P both SFA long stenting, 3 YA
→ 6 sessions of TVR (other hospital)

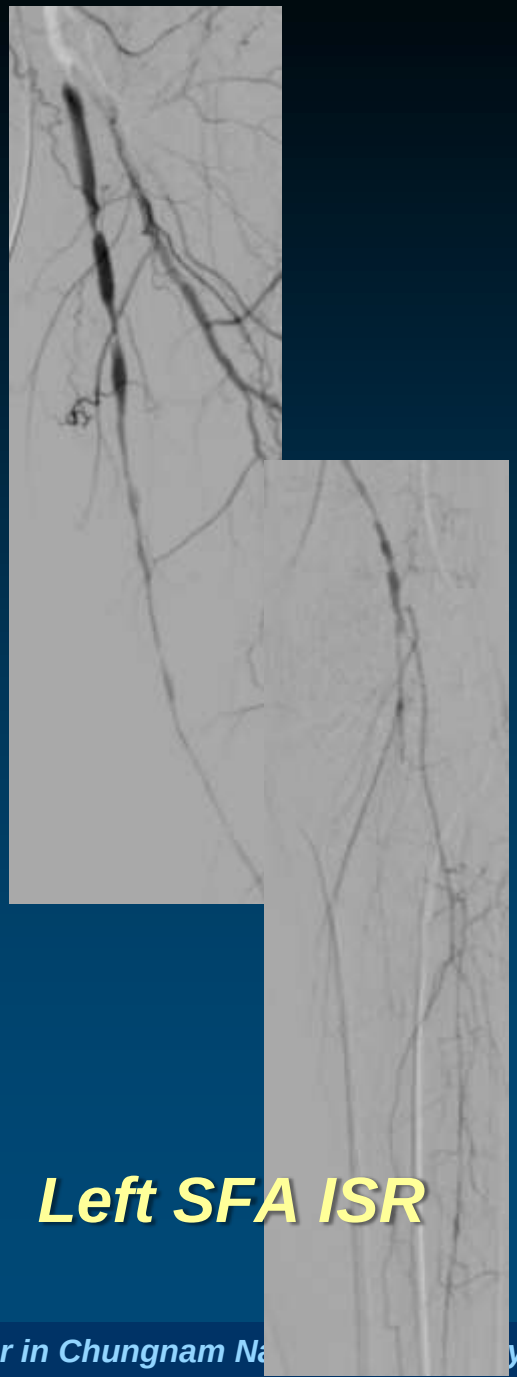
Turbohawk Artherectomy

After atherectomy



DCB angioplasty

Final



Left SFA ISR

Turbohawk atherectomy
& DCB angioplasty

Final

46/M

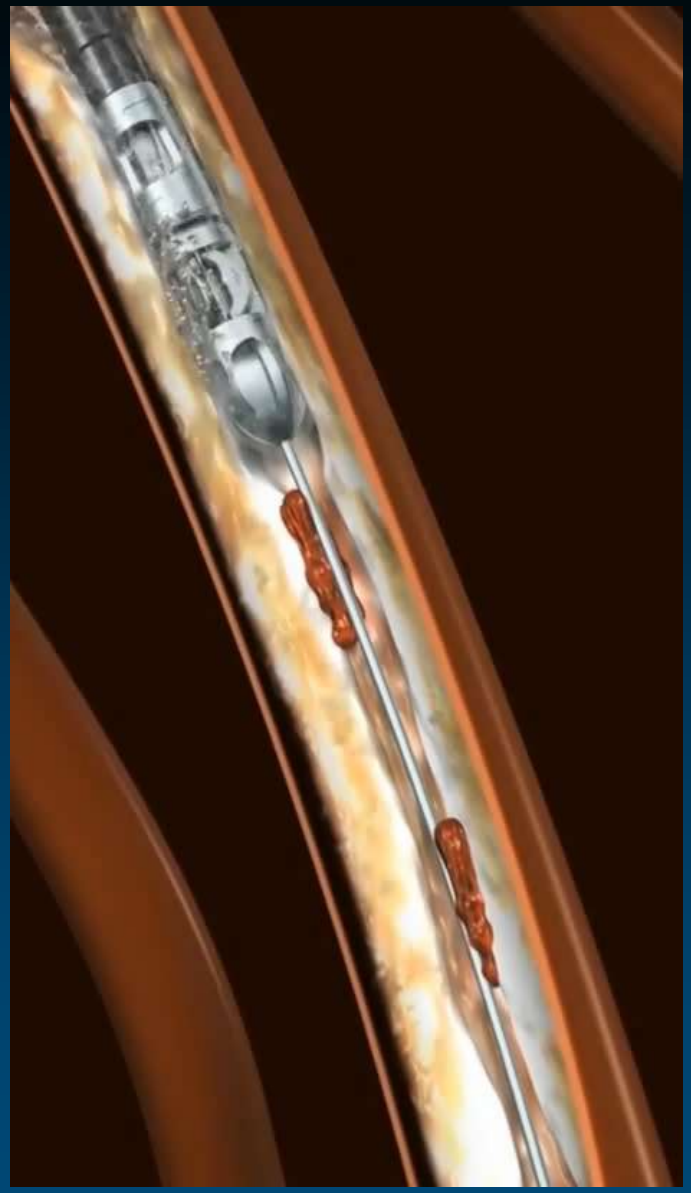
Known polycythemia vera

F/U lost for 2 yrs

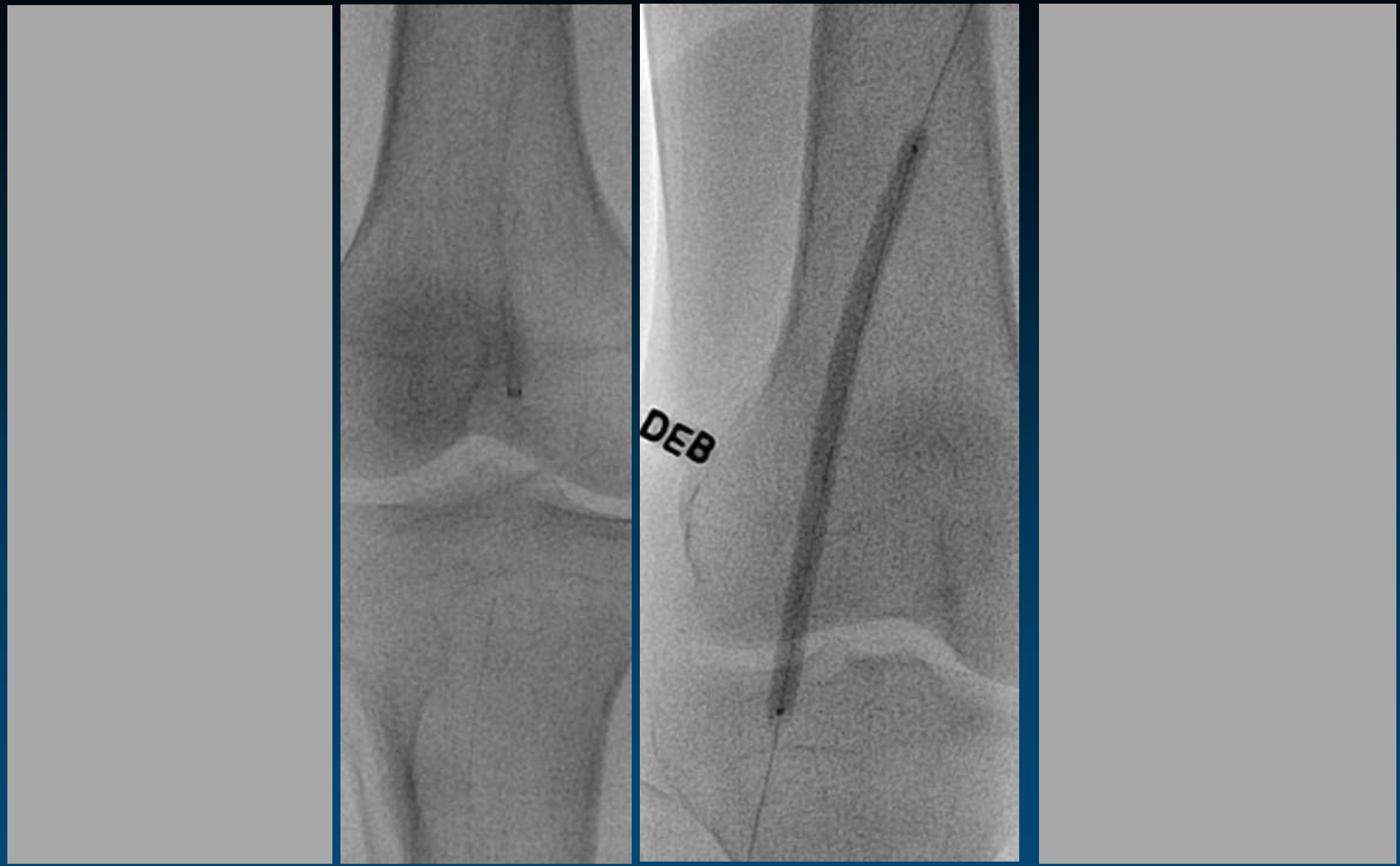
Hb 20.5g/dL, WBC 20,500/uL, PLT 512K/uL

Right calf pain and coldness for 5 monts

→ Right 1st toe gangrene for 1 month



Jetstream Atherectomy



DEB 6.0x120 mm

89/F

HTN

S/P TKRA, both

Old inferior MI, 2VD, 9YA

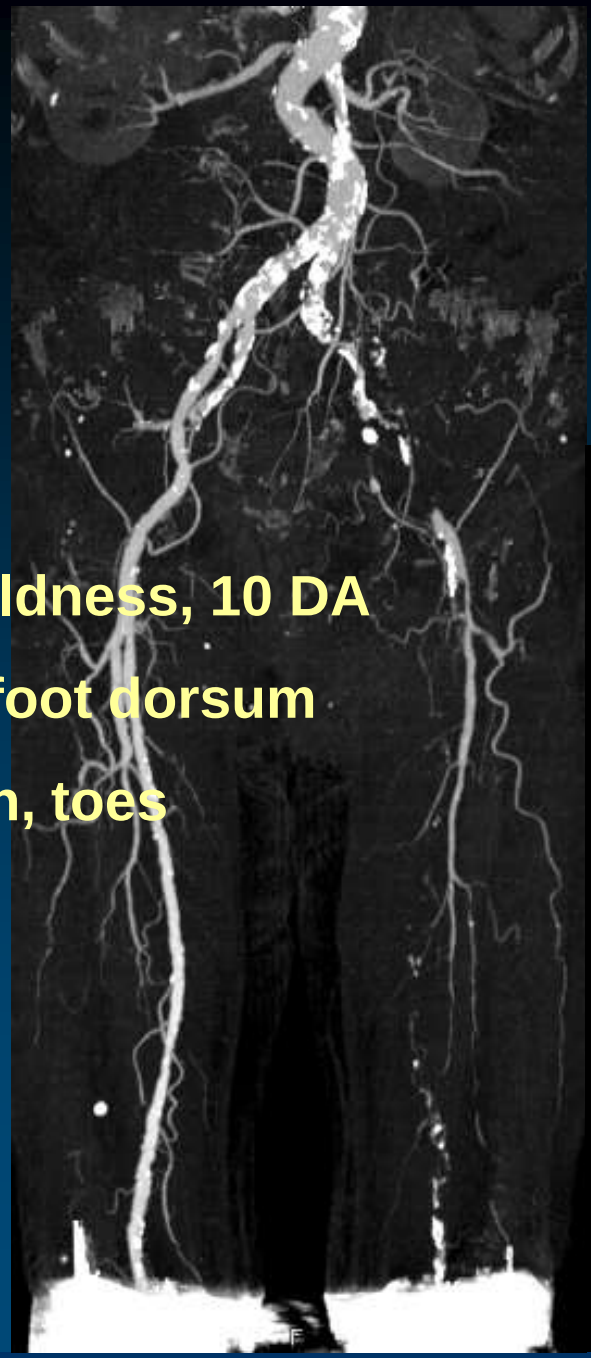
Resting left leg pain and coldness, 10 DA

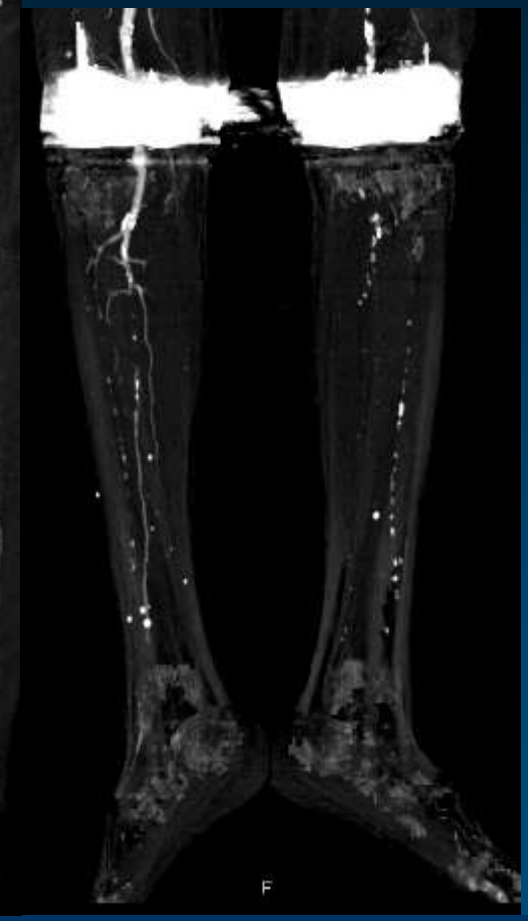
→ Decreased sensory on foot dorsum

Difficulty of dorsiflexion, toes

ALI on chronic ASO

- Rutherford IIb ALI limb





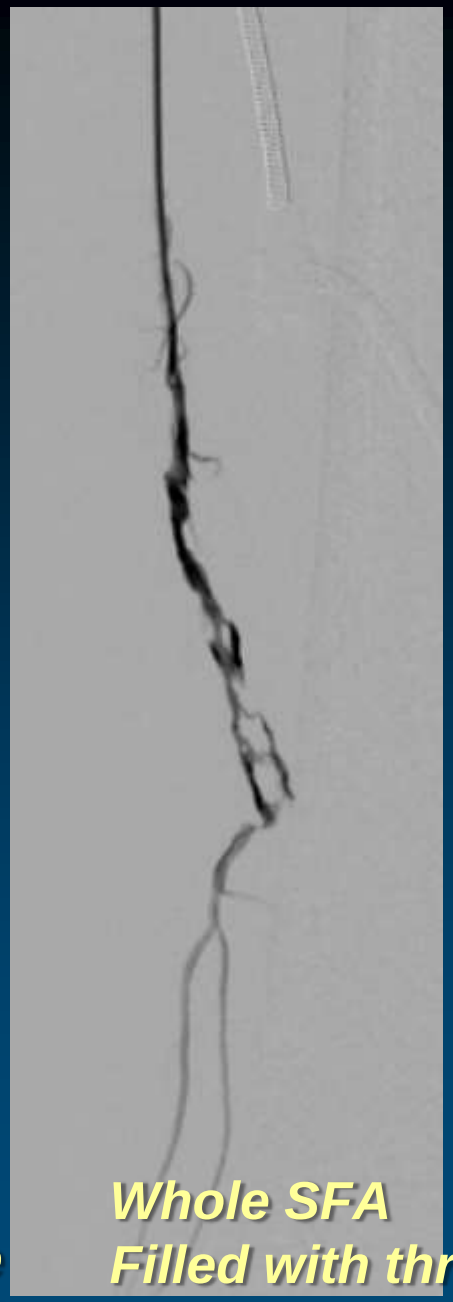
Hostile aortoiliac angle

Easy GW passage
(0.035” Terumo)

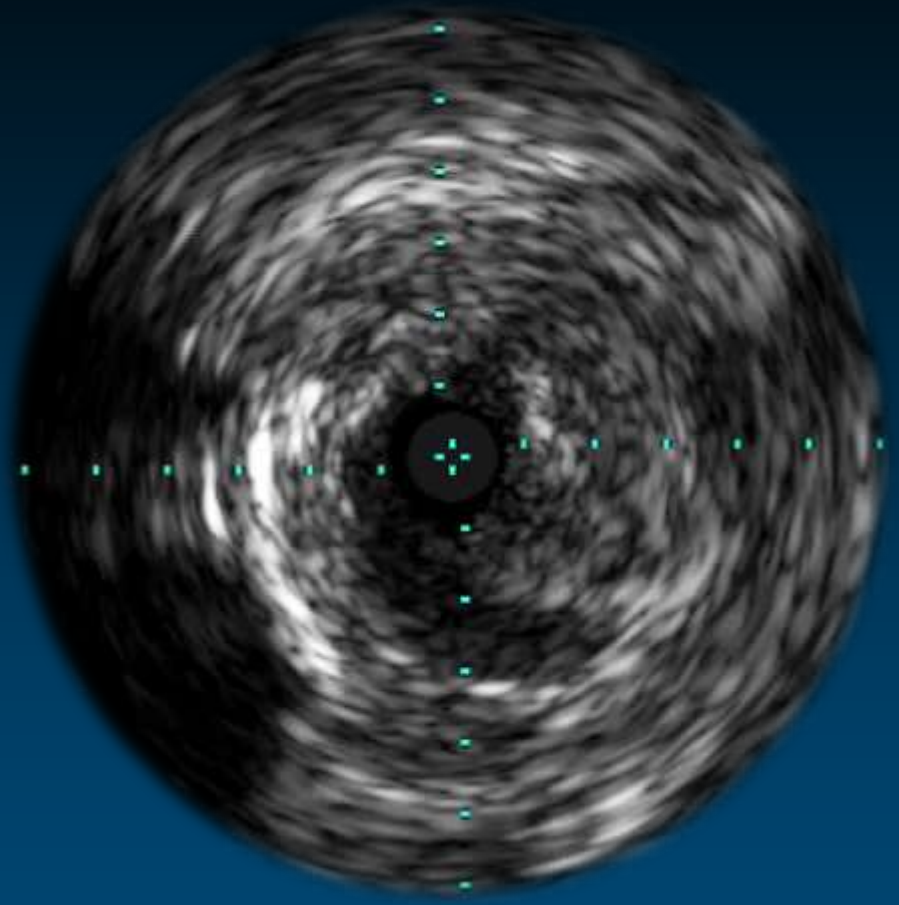
Snare the contra. wire
→ 7 Fr Ansel from Rt. CFA

SFA occlusion

Easy GW passage
(0.014” Command)

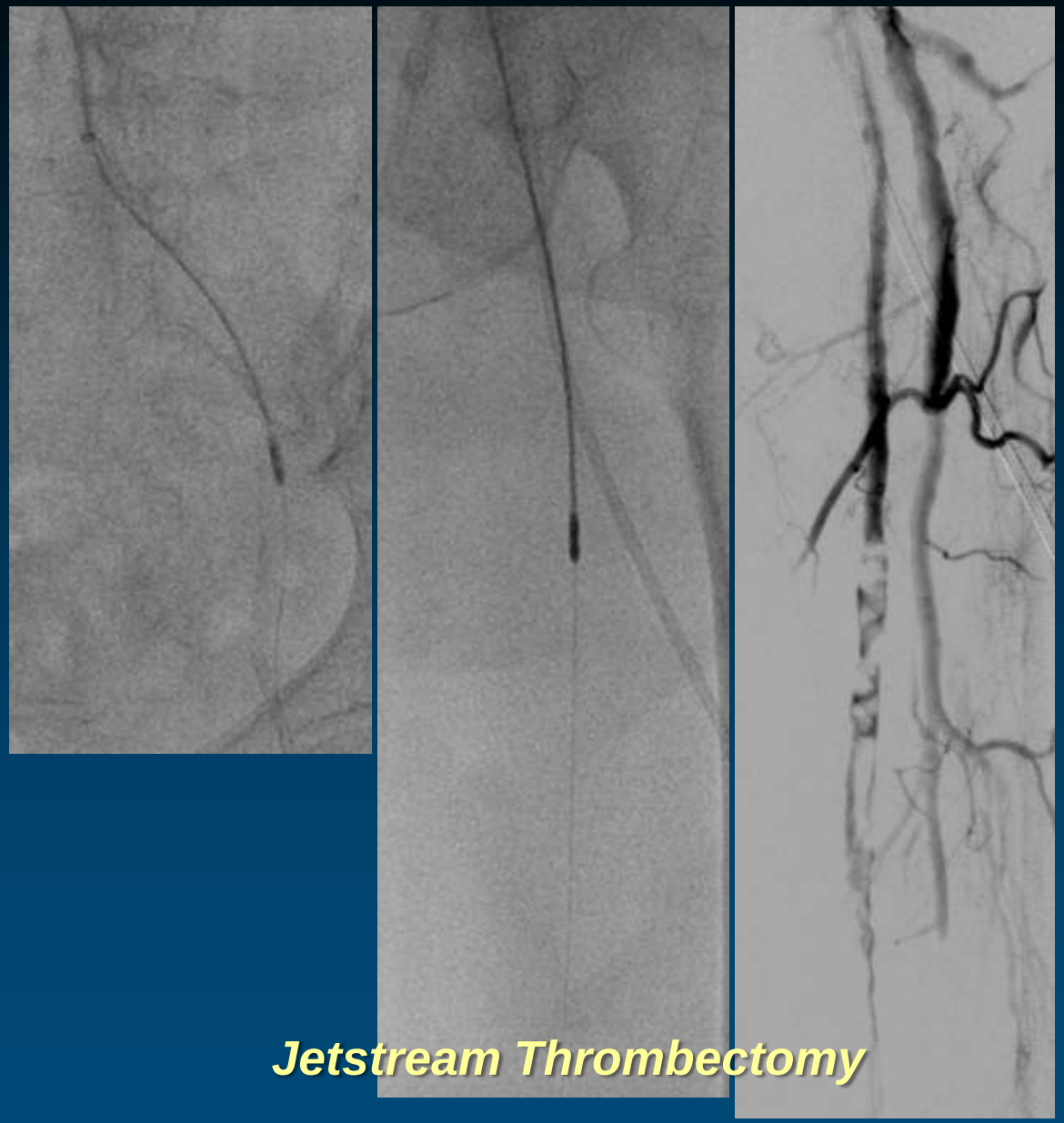


Whole SFA
Filled with thrombi

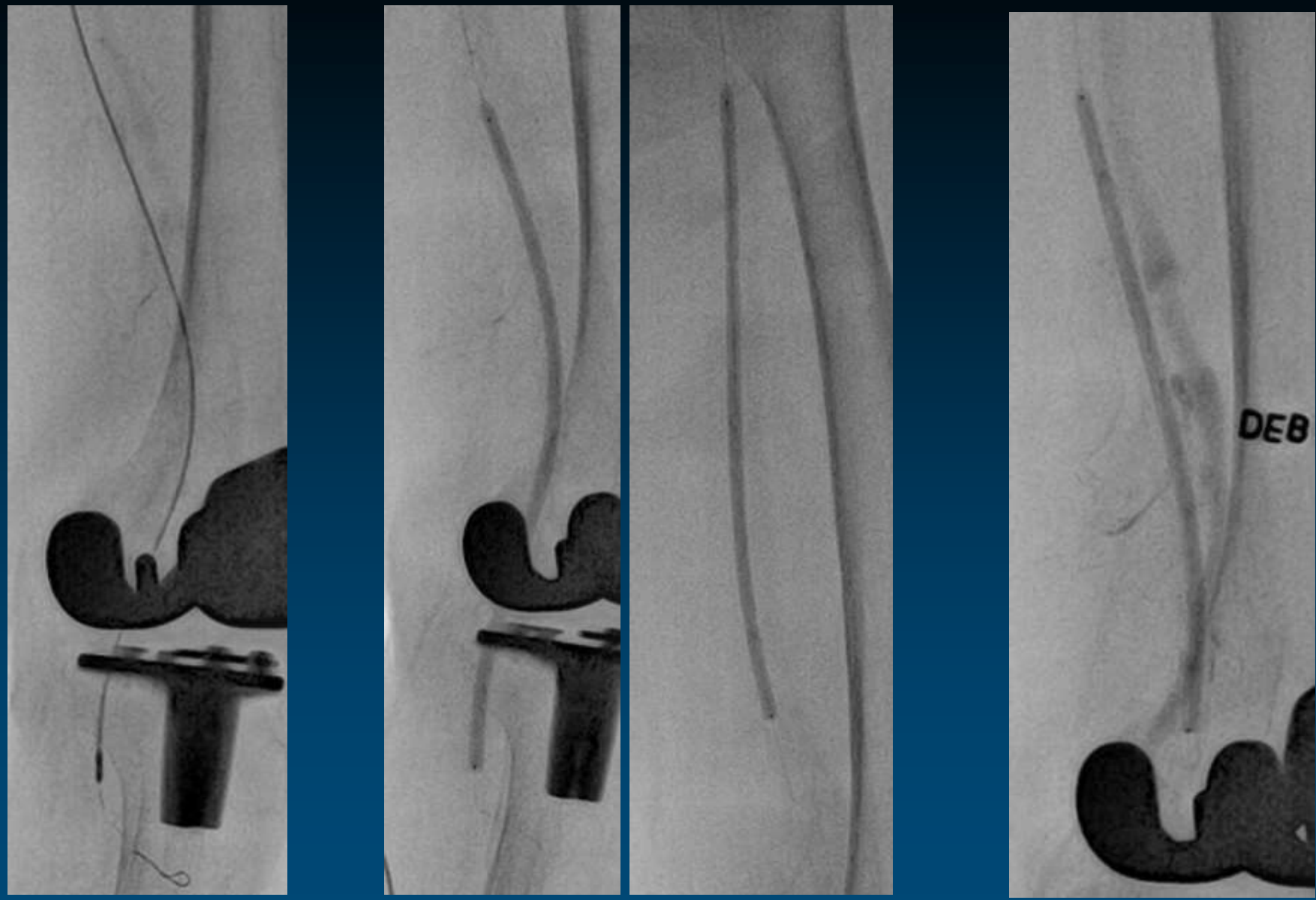


IVUS
- Intraluminal GW passage
- Filled with thrombi

GW passage to pATA

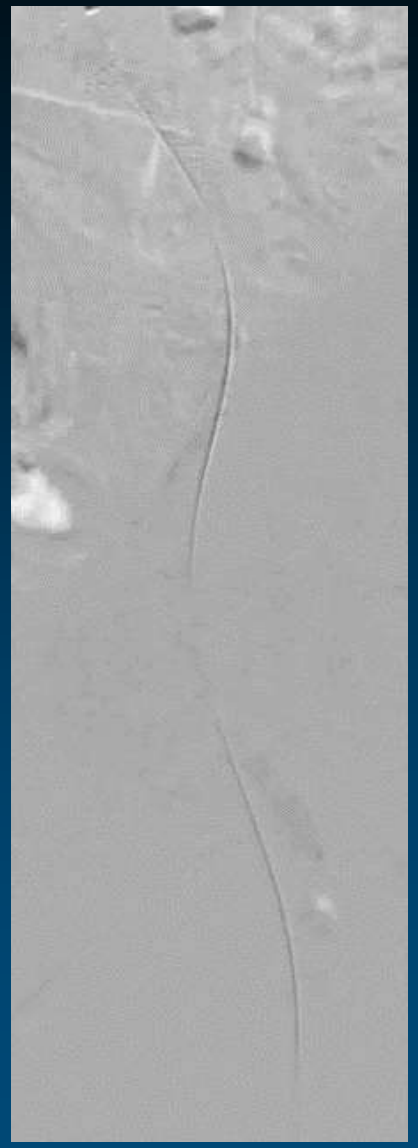


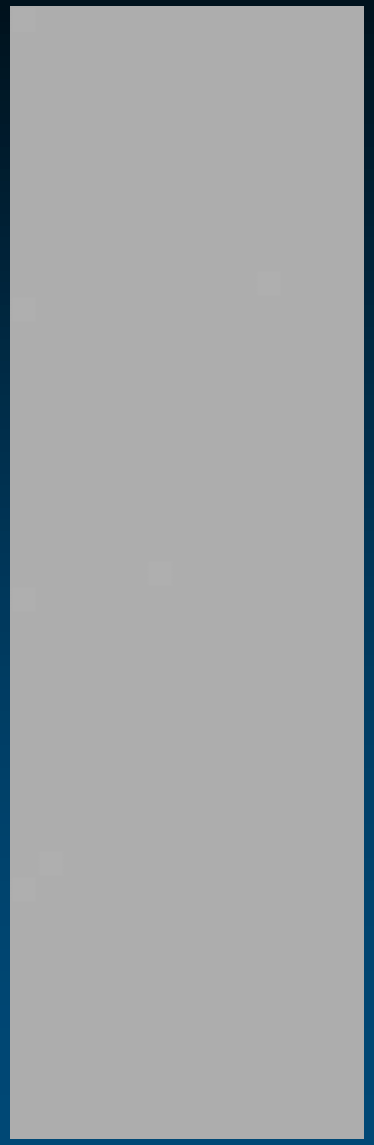
Jetstream Thrombectomy

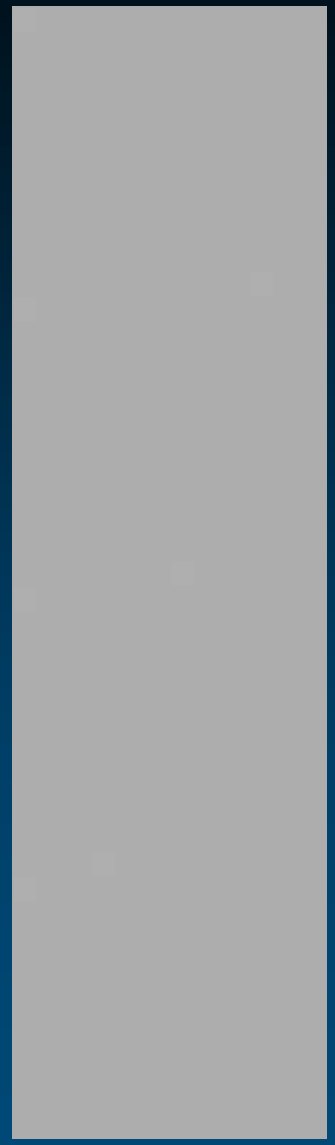


Jetstream Thrombectomy → POBA 5.0x200 mm → DCB 5.0x150 mm

Final Angiogram







EIA; 10x100mm SE stent

Femoropopliteal; Nothing behind

Summary

AART w nothing behind for TASC C/D FP ds

- ***Cons (DEB)***
  - **- Smaller lumen gain, elastic recoil & dissection**
    - **→ Achilles heel of balloon angioplasty**
  - **- Higher restenosis than DES/Supera? Limited data**
- ***Cons (Atherectomy)***
  - **- Larger sheath needed**
  - **- Time consuming, Higher cost**
  - **- Need more experience**
  - **- ↑ Risk of embolization or perforation**

Summary

AART w nothing behind for TASC C/D FP ds

- ***Pros (DEB ± Atherectomy)***
  - **Powerful plaque excision, wider lumen gain**
  - **Not so difficult, Need small training**
  - **Rare vessel dissection despite of calcium**
  - **Stent is seldom needed**

    → Reduce the risk of stent-related complication

    ; Fracture, ISR, Stent thrombosis …
  - **Powerful tool for non-stenting zone**
  - **Thrombectomy for ALI (Rotational device)**
  - **Leave additional option for the future**

Leave Nothing Behind !!

Live Without Claudication !!

Thanks for the Time