

28<sup>th</sup>  
**TCTAP**

**MAY 6-9, 2023**  
GRAND WALKERHILL SEOUL,  
KOREA



# *How I Manage Long Femoropopliteal CTOs with EVT*

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# Disclosure

- Nothing to disclose regards to this presentation

# *Long SFA CTO lesion*

- Not infrequent cases / unpredictable - Large thrombus or atheroma burden*
- Easily recurred due to various mechanical causes*
- Favor nothing behind technique with debulking rather than stenting, however, frequent scaffold would be needed*
- Relatively difficulty in complete true lumen wiring*
- Bidirectional approach – dSFA/Pop/Below knee approach*
- Extravascular ultrasound(EVUS)/IVUS guided technique – usually Rt side*
- Subintimal technique (SA) with/without reentry device – failed true lumen wiring*

# *Main decision factor for long SEA CTO*

- Proximal stump + Microcatheter with durable 018 proximal wiring first → distal puncture with reverse CART*
- Proximal Stump - distal puncture with microcatheter supported 018 wire guided proximal hard wire targeting*
- Calcification +++ - Bidirectional approach with reverse CART or anchor balloon intraluminal or subintimal wiring*
- Calcification ± Thrombus - Ultrasound guidance (EVUS/IVUS) or microcatheter based/ simple wiring with thrombectomy/atherectomy device*
- Sufficient distal puncture site - usual position / ultrasound or fluoroscopic approach*
- Poor distal puncture site – Frog leg position with retrograde wiring supported by proximal decompression / BTK artery puncture with 014 microcatheter*

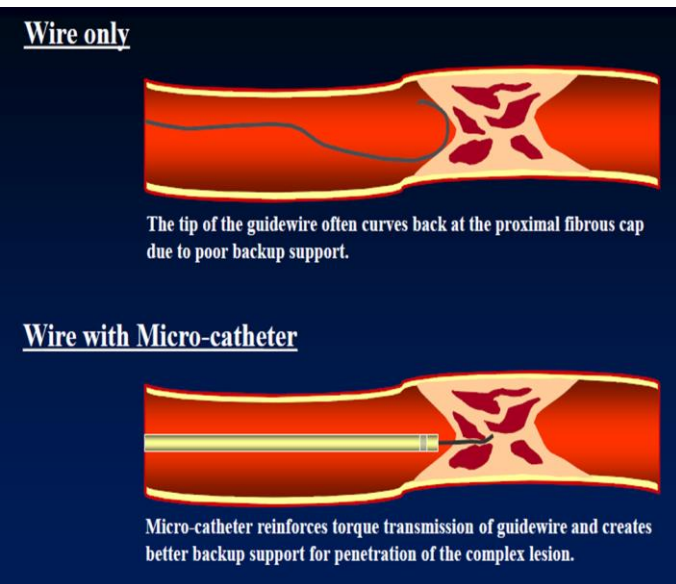
# *Scaffold or Not*

- *Complete True Lumen wiring → DCB with or without debulking procedure → residual flow limiting dissection → Bail out stenting*
- *Subintimal wiring → DES spot or long overlap manner*
- *Ture/Subintimal mixed wiring → DES or DCB accompanied by bail out stenting*

# Management of supporting catheter



- ✓ *Maximal guiding sheath support*
- ✓ *Short distance between wire & catheter*
- ✓ *Occasionally supporting catheter first*
- ✓ *Less injury tech. for further attempt*
- ✓ *Aggressive push make looping or kinking of mid portion of supporting catheter*
- ✓ *018/014 alternative use for penetration*



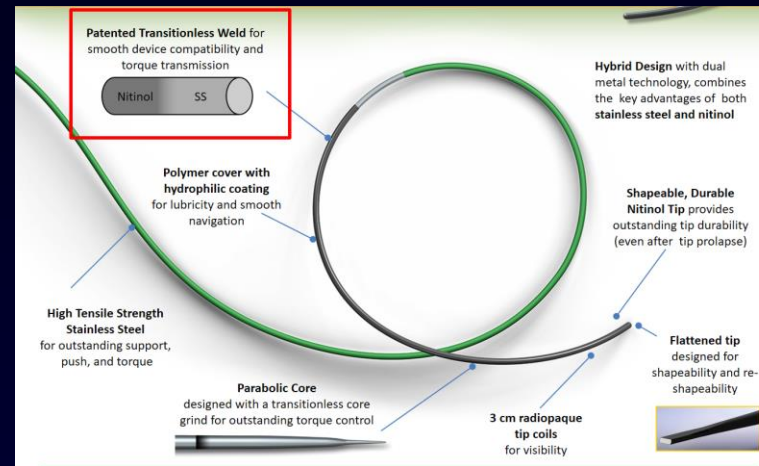
3<sup>rd</sup> Generation GW's

## Stainless Steel + Nitinol

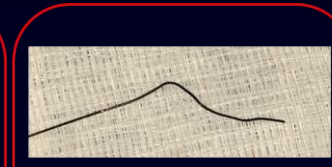
- High Torque
- Pushability
- Durability
- Kink Resistance
- Flexibility



# Durable workhorse wire - Hi-Torque Command 18 Intraluminal or subintimal approach



**Image 1a:** Competitive .018 stainless steel wire tip post-looping in subintimal plane



**Image 1b:** Competitive .018 stainless steel wire after attempted reshaping



**Image 2a:** Hi-Torque Command ES tip post-looping in subintimal plane



**Image 2b:** Hi-Torque Command ES wire after attempted reshaping

Hi-Torque Command  
18 ST

Crossing wire with **10 cm** Nitinol at distal end providing high support and flexible tip (**4g**) designed for crossing occlusions or prolapsing in the subintimal plane.

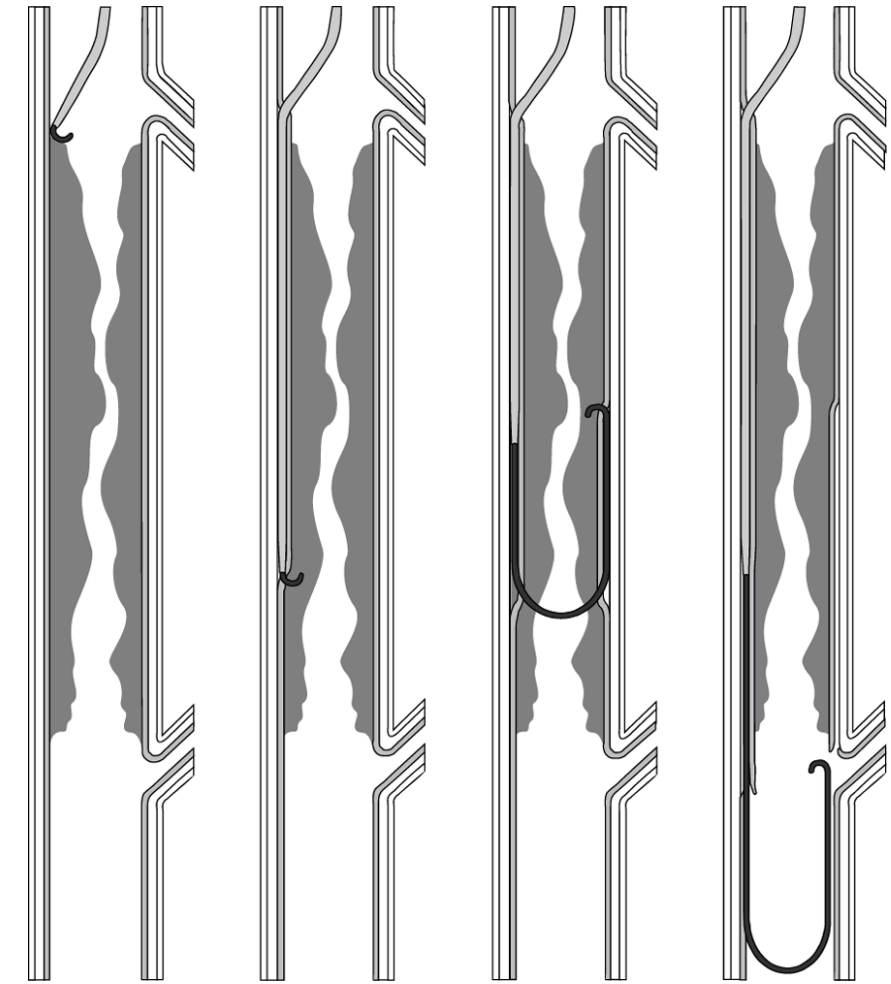


Hi-Torque  
Command 18 LT

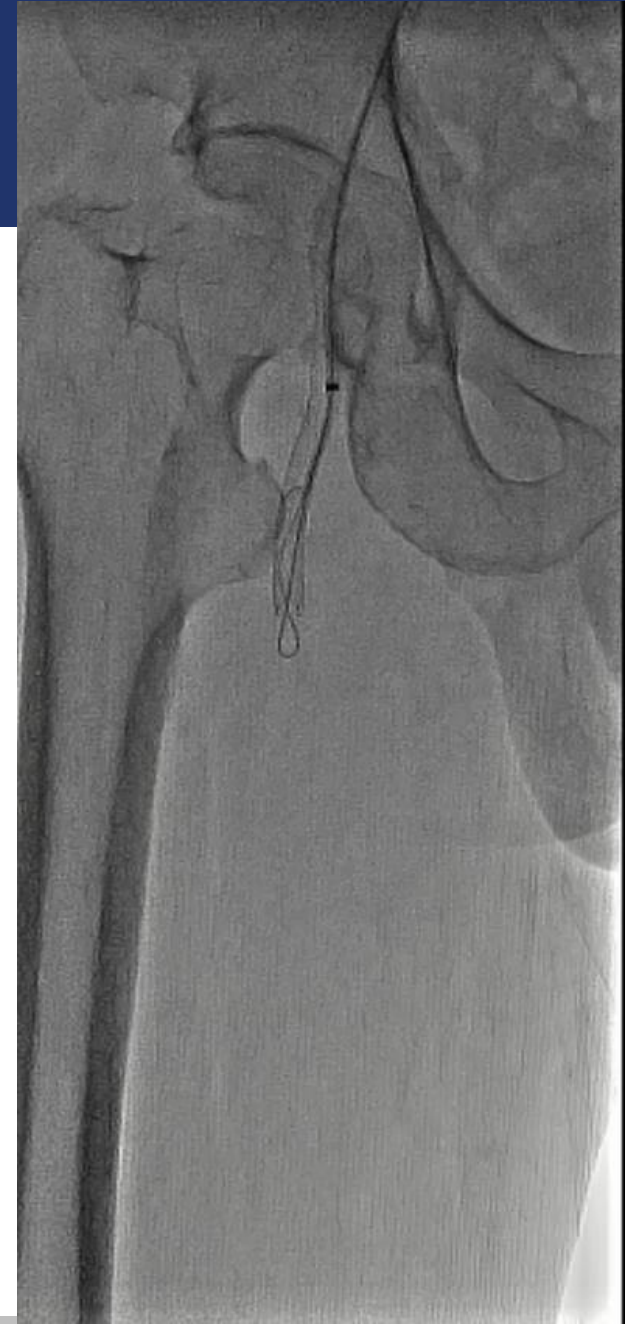
Navigation wire with **25cm** Nitinol at distal end, providing flexible support and soft tip (**4g**) to effectively track through tortuosity.



# *Subintimal Technique for Long SFA CTO*



- *Relatively easy*
- *Timely effective*
- *Inexpensive*
- *Distal re-entery*
- *Heavy calcified lesion – perforation / incomplete expansion*





# *Subintimal Technique*

JR/MP with 035 Termo

➔ Failed to penetration

Change to 018/014 hydrophilic wire

# Distal puncture and Reverse CART Technique

- Usually from distal to proximal

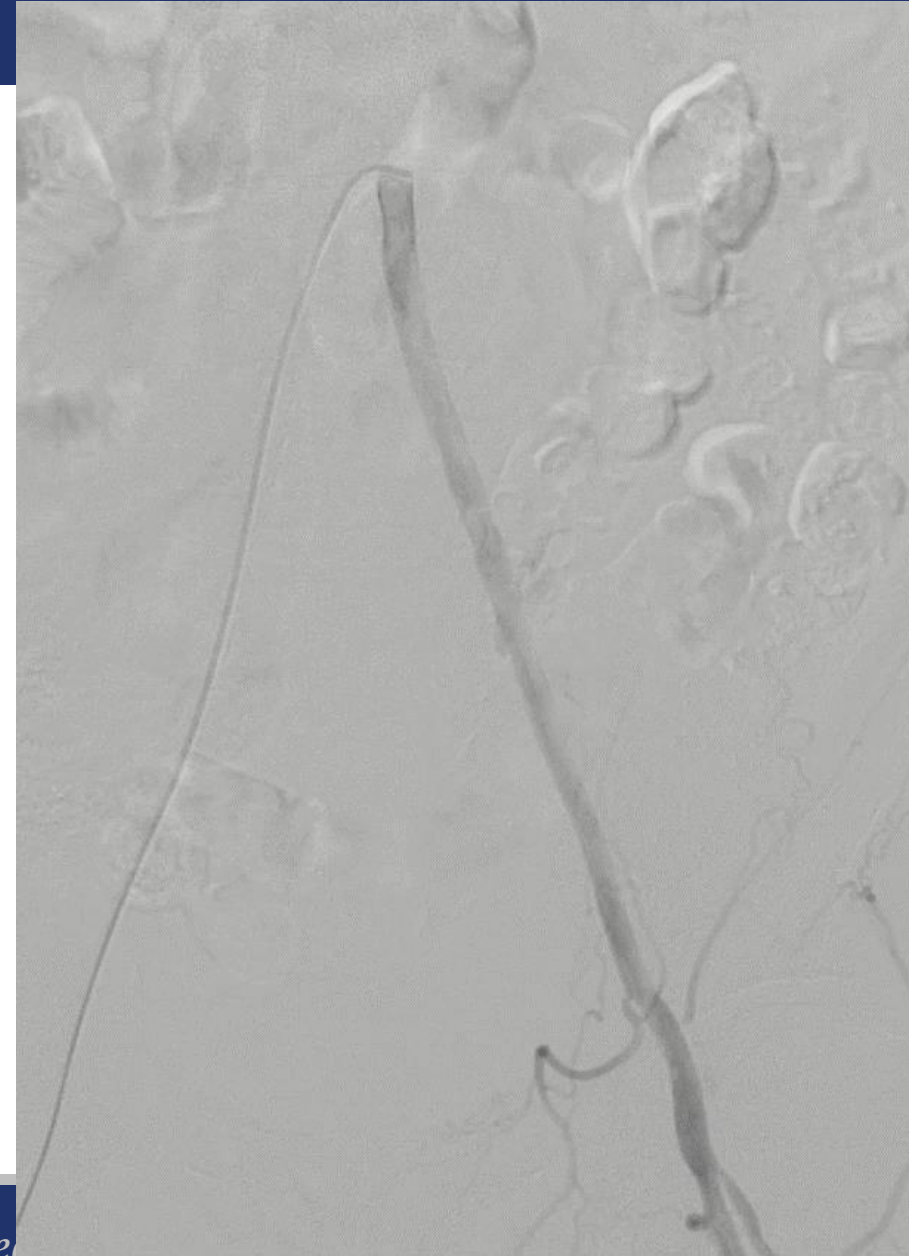
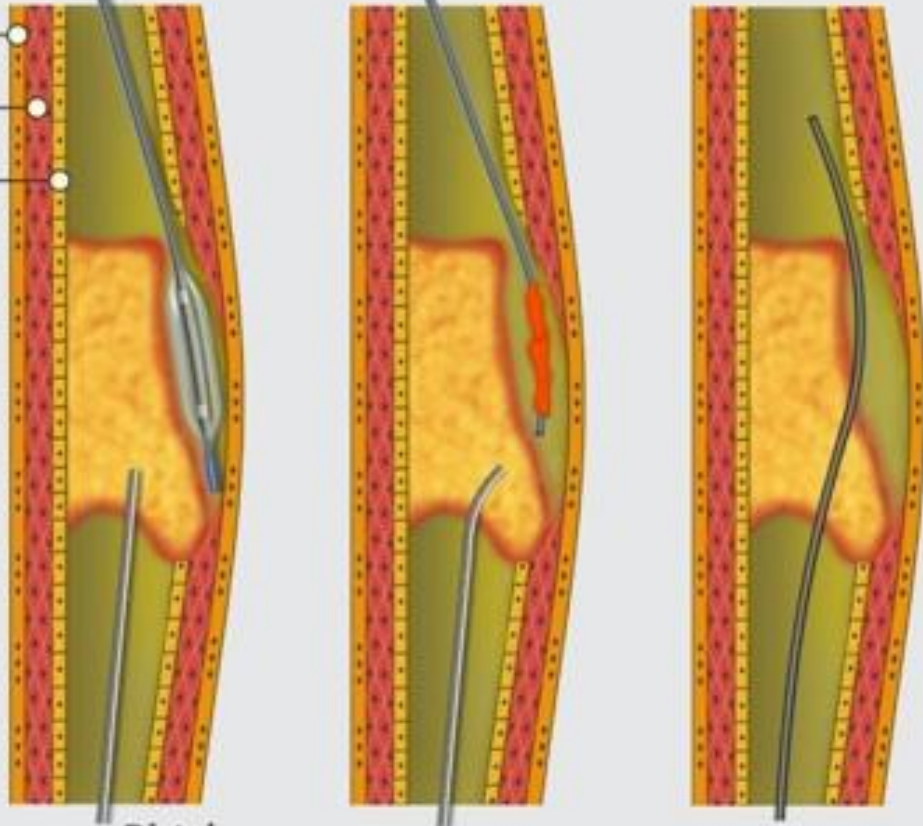
Proximal

Adventitia

Media

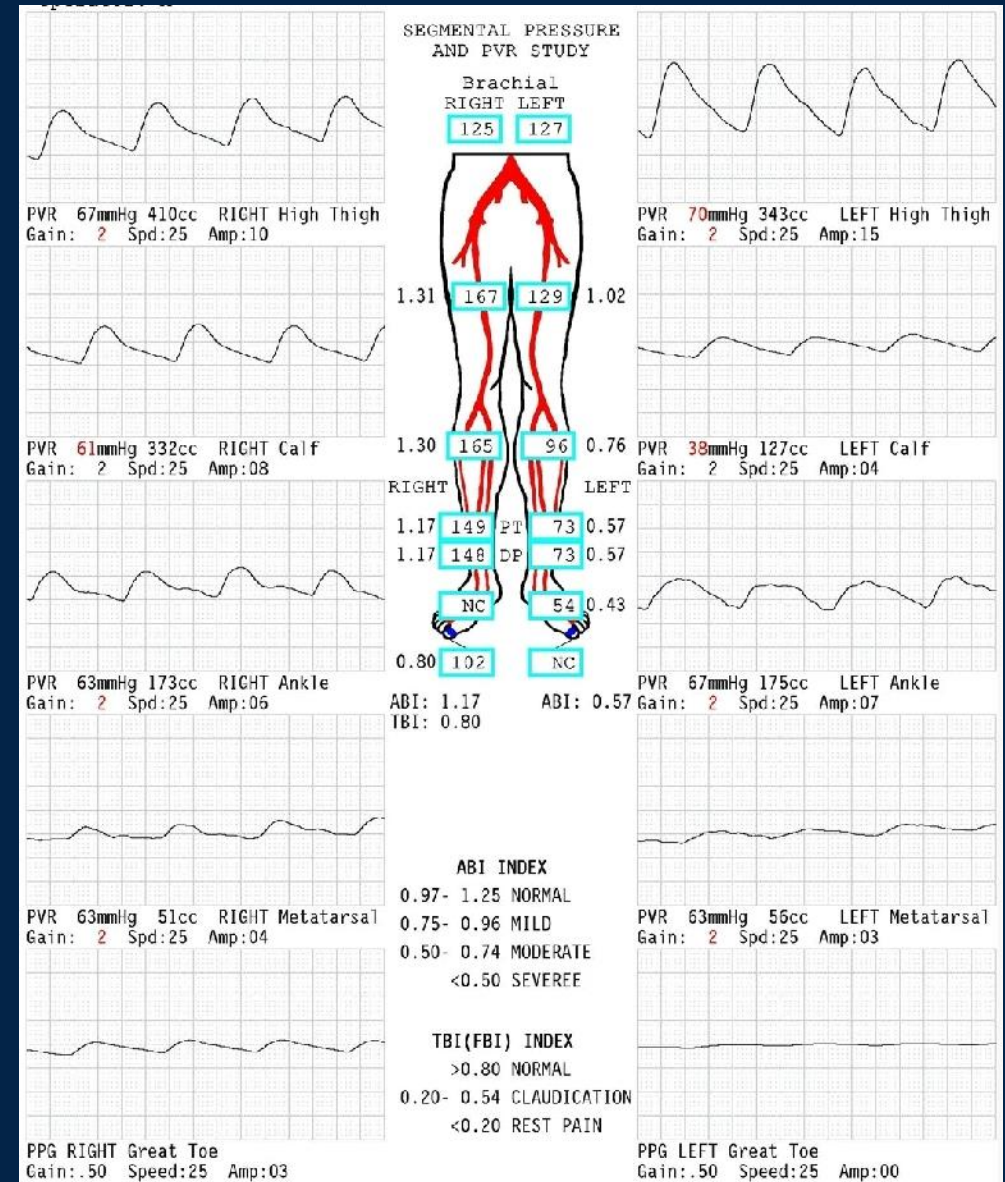
Intima

Distal



# M/65

- C.C: Poor wound recovery and soft tissue defect after recent trauma & multiple fracture s/p open reduction & internal fixation*

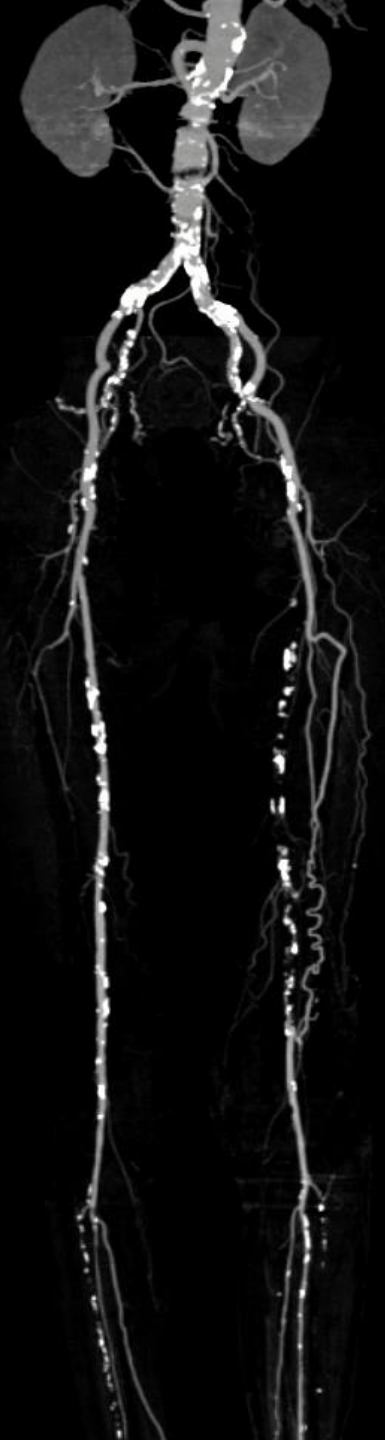


**ABI- Rt: 1.17/ Lt: 0.57**

# CT angiogram

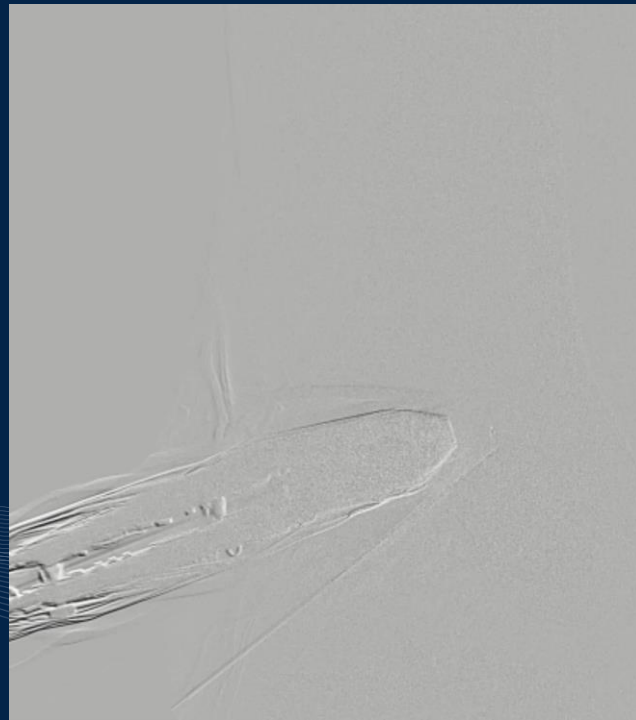
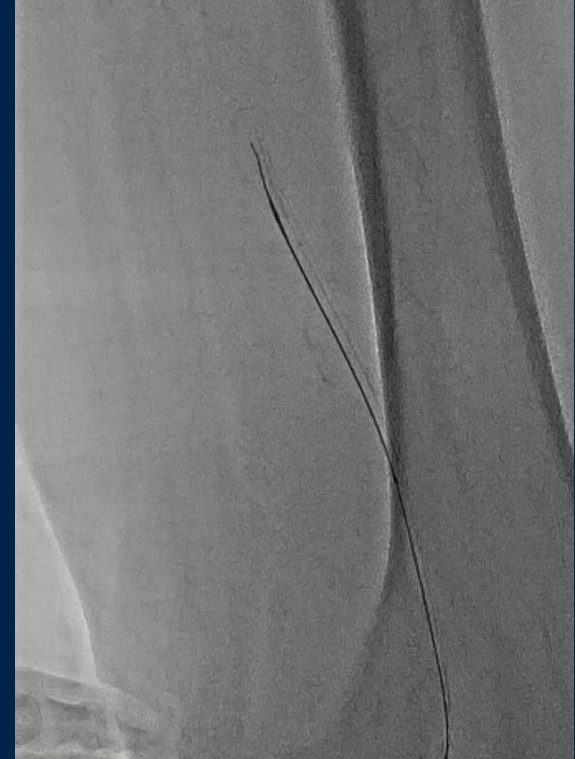
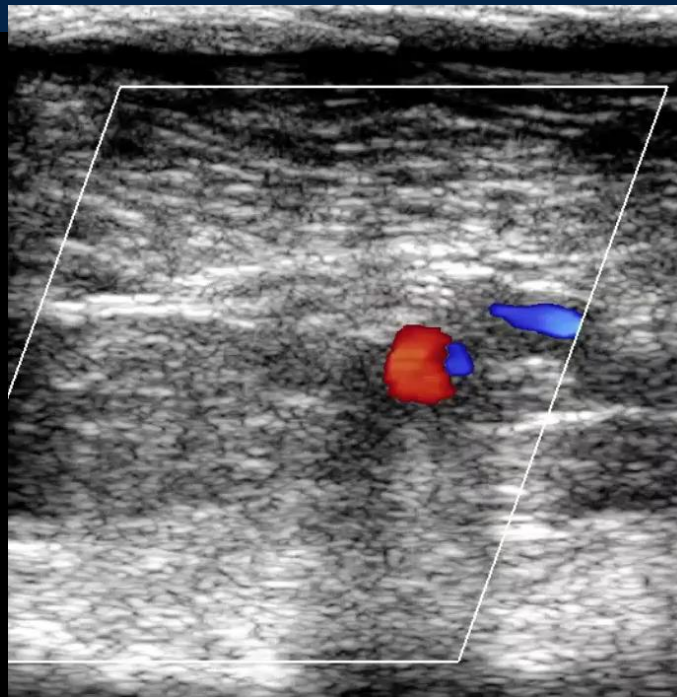
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- Long SFA CTO
  - Proximal short stump
  - Scattered heavy calcium
  - Short distal SFA to pop. Artery
- 



# Proximal Stump +/- Poor distal puncture site/ antegrade wiring first





**Poor penetration with  
subintimally → Frog leg  
and popliteal puncture  
(018 CXI with command  
018) → poor distal  
support for wire advance**



**Bidirectional wiring**  
→ reverse CART  
distal to proximal  
SFA  
→ long NC balloon  
→ DES at p~m SFA  
Eluvia  
6X120/7X120mm  
→ DCB at dSFA to  
pop.

M/68, RII Caludicant, ABI 0.57/0.60

- *1<sup>st</sup> Target Rt SFA*
  - *Poor stump SFA flush occlusion*
  - *Long segment*
  - *Margial length of distal SFA puncture*
  - *Less calcified lesion*
  - *Good BTK flow*
  - *Both iliac lesions*





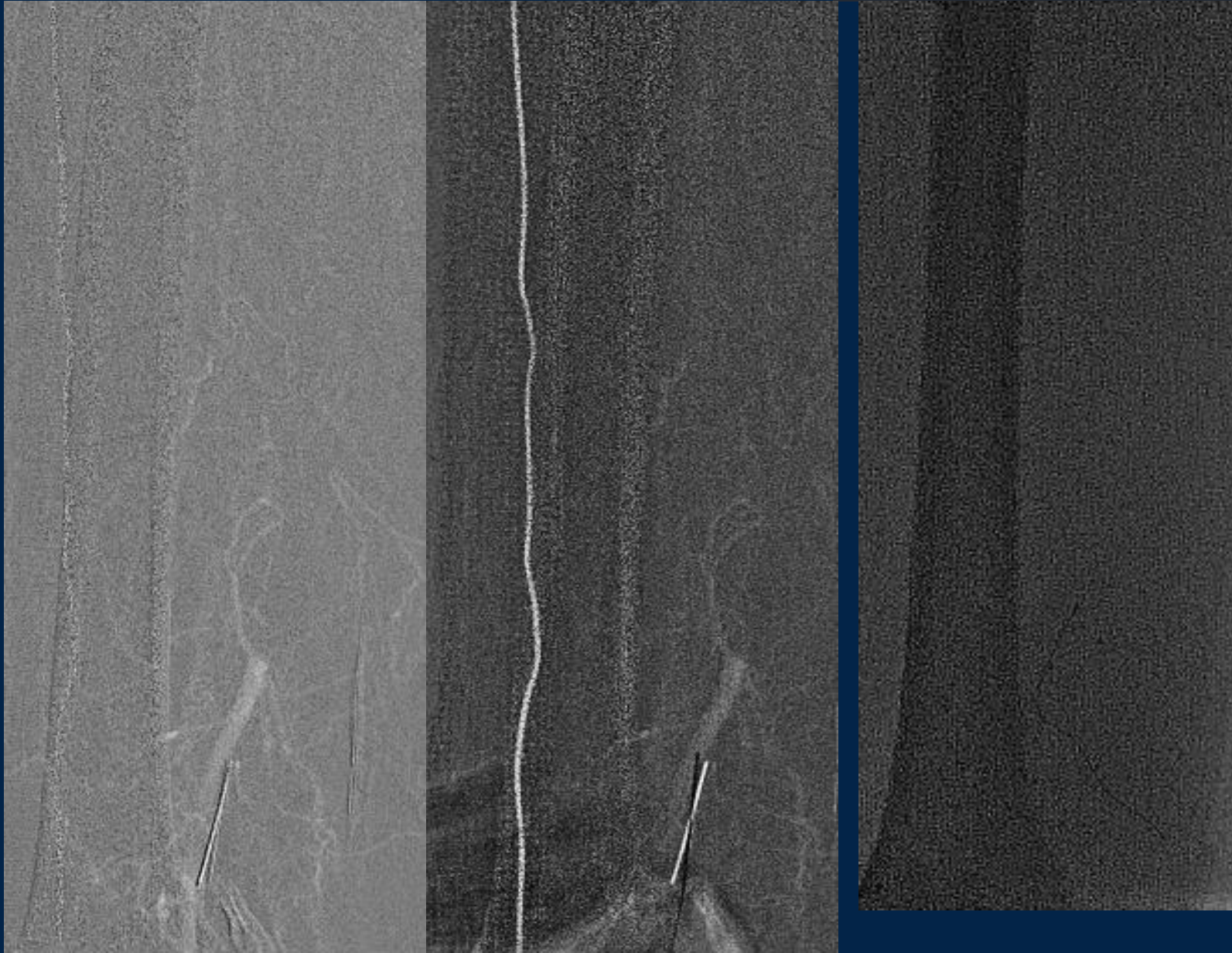
# Contralateral Sheath insertion & Angiogram

- MPA + Terumo → 7Fr Ansel



# 1<sup>st</sup> –Distal SFA approach

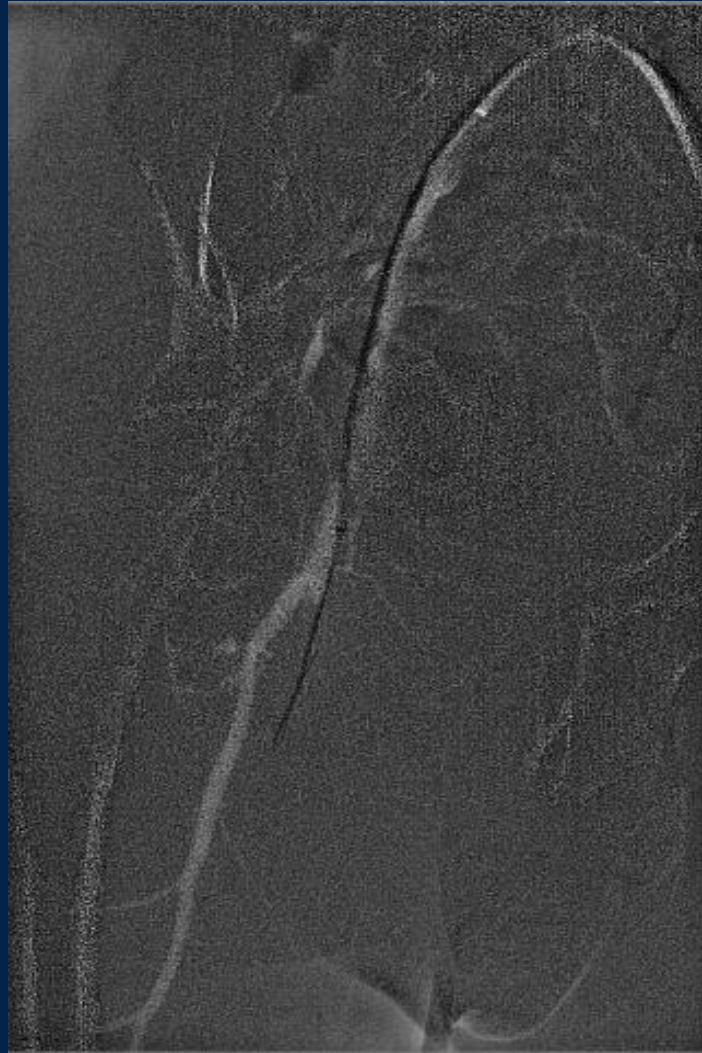
- Rt. dSFA micropuncture → 018" Commnad G/W



- Either Roadmap guided or Ultrasound guided distal SFA puncture
- Short-length of dSFA → failed microtheter dilator/ microcather advancement
- Wire advancement failed d/t resistance

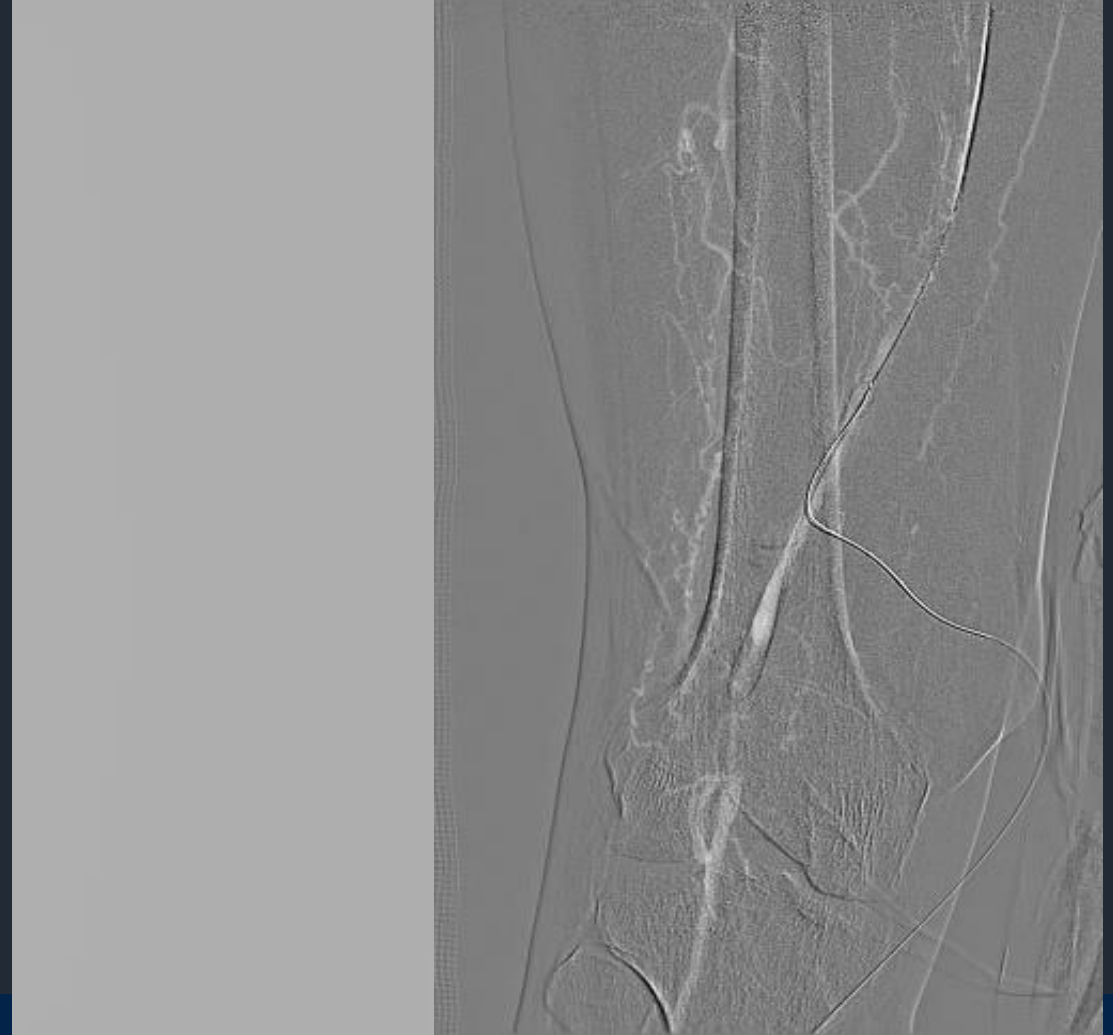
# Contralateral approach with subintimal technique

- Antegrade approach: 035 Termo-J" G/W + MPA catheter



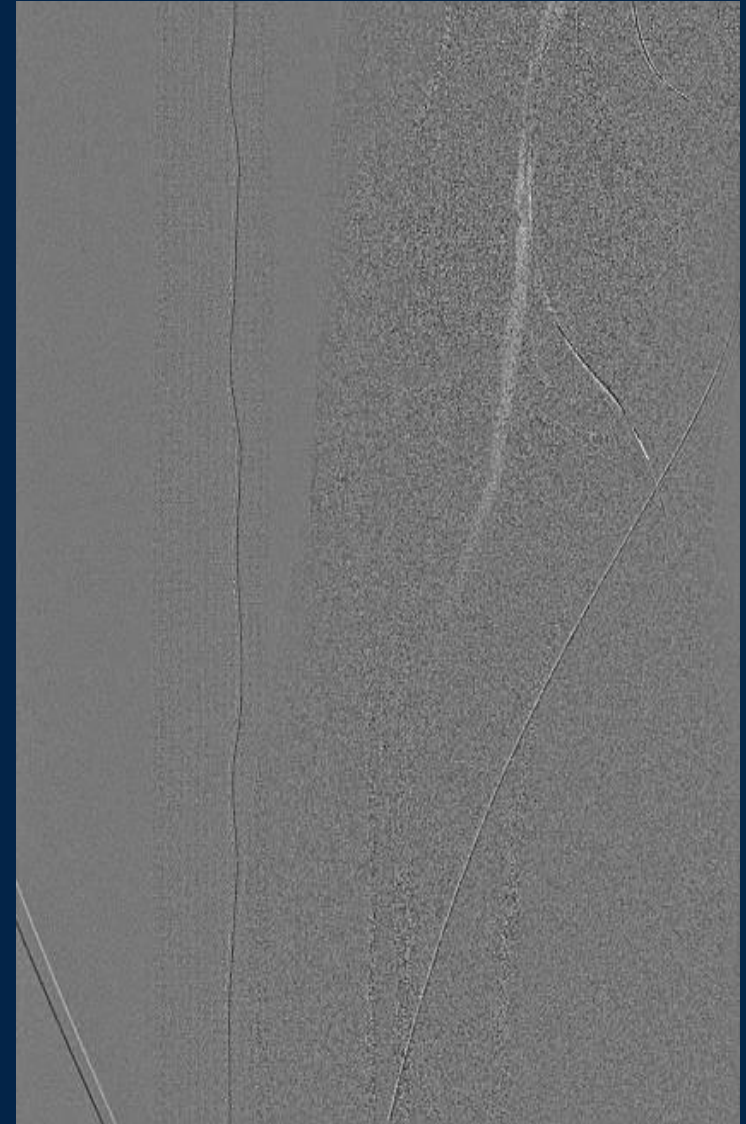
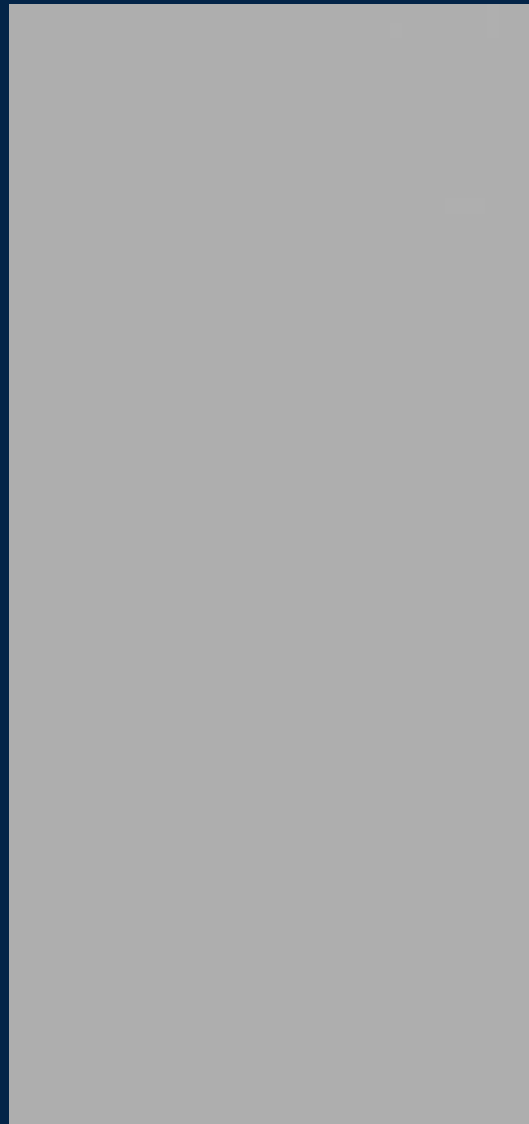
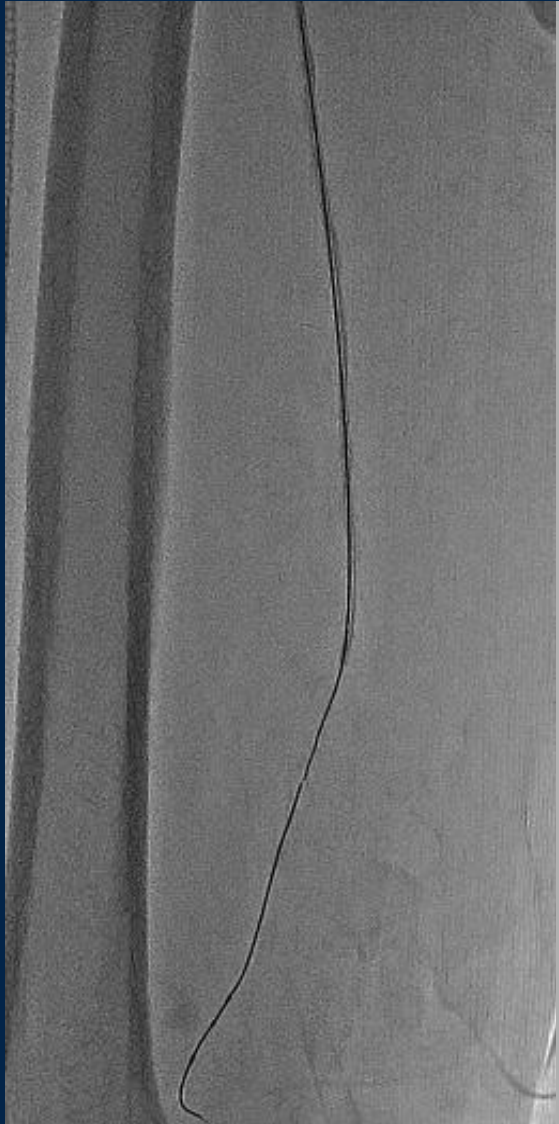
# Subintimal wiring just to distal puncture wire

- Antegrade approach: 035+MP Termo → 018" Halberd G/W + 18 CXI Catheter

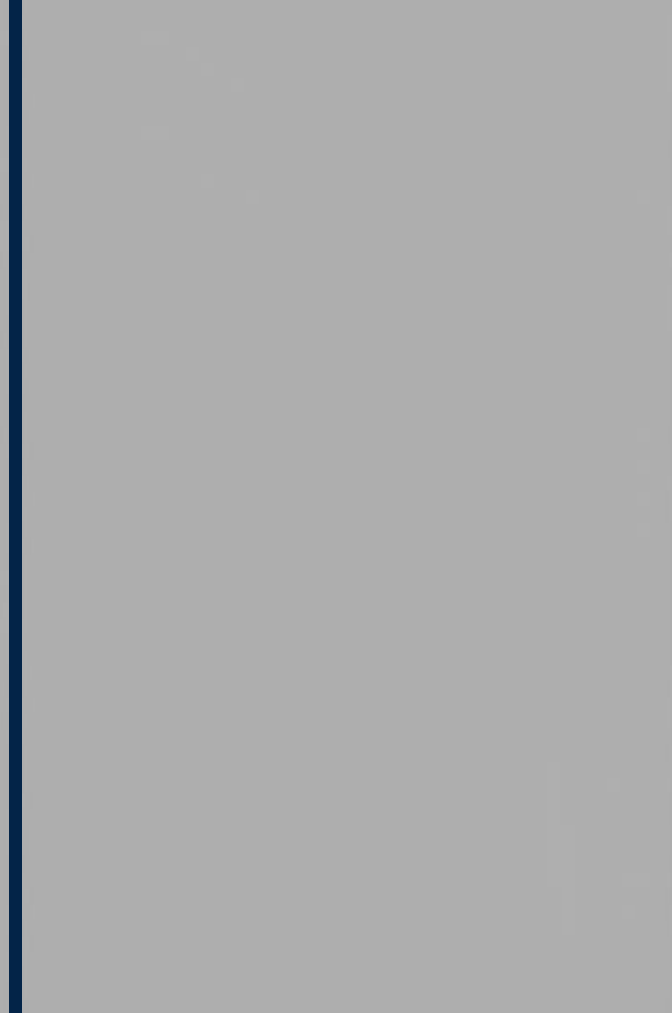


# Hard wire penetration – DCB

- Antegrade approach: 018" Astato 30 G/W + MPA Catheter → command 014

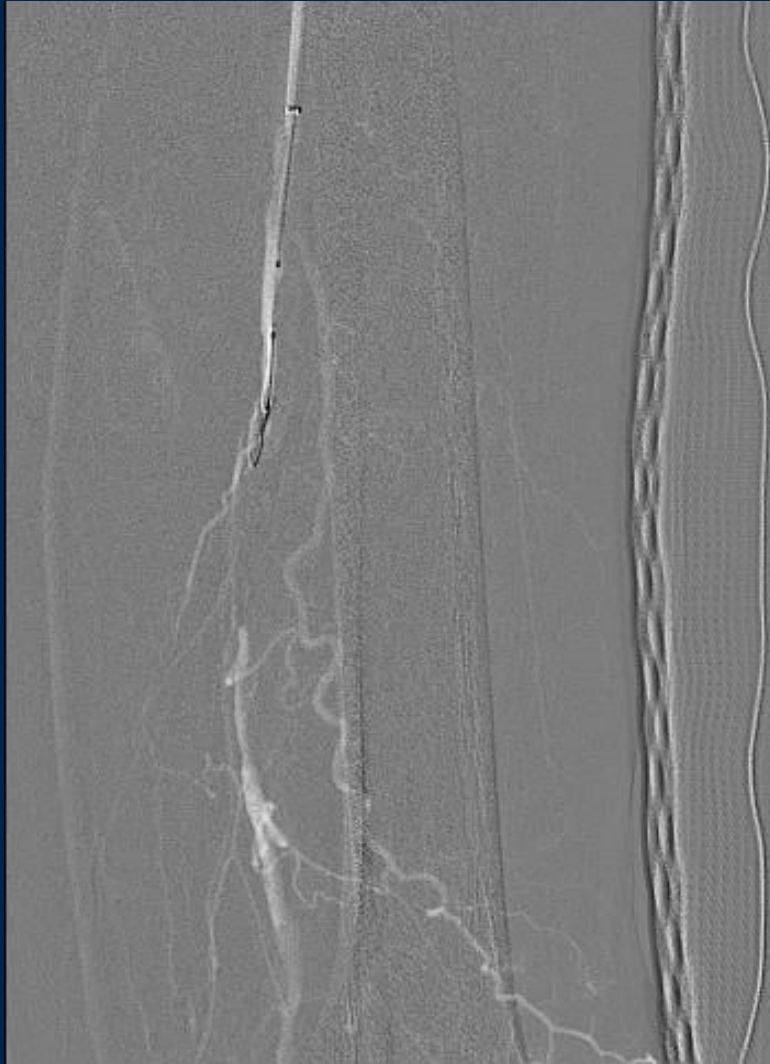


# Lt. SFA – Antegrade approach



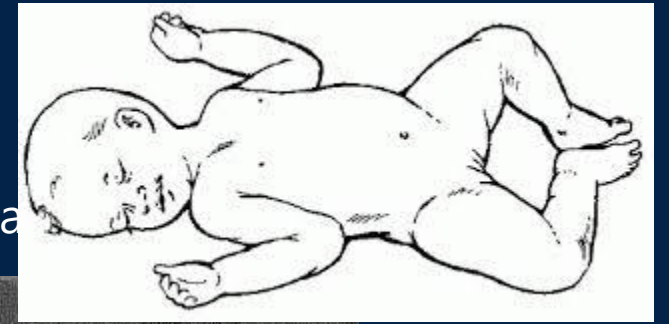
# Initial antegrade wiring

- Antegrade approach: 018" Command G/W + 18 Rubicon Catheter → Failed penetration



# Popliteal puncture – Frog leg position

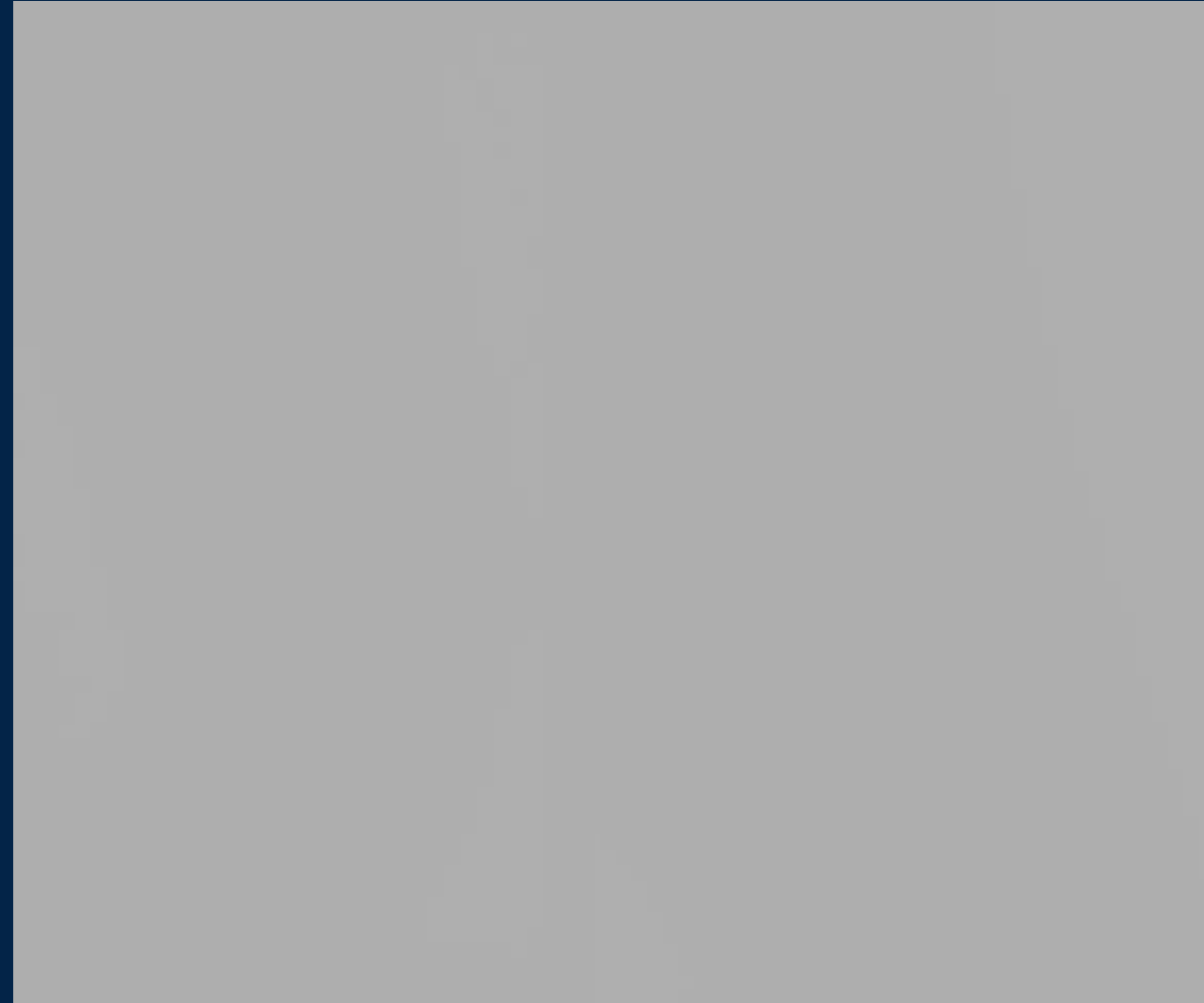
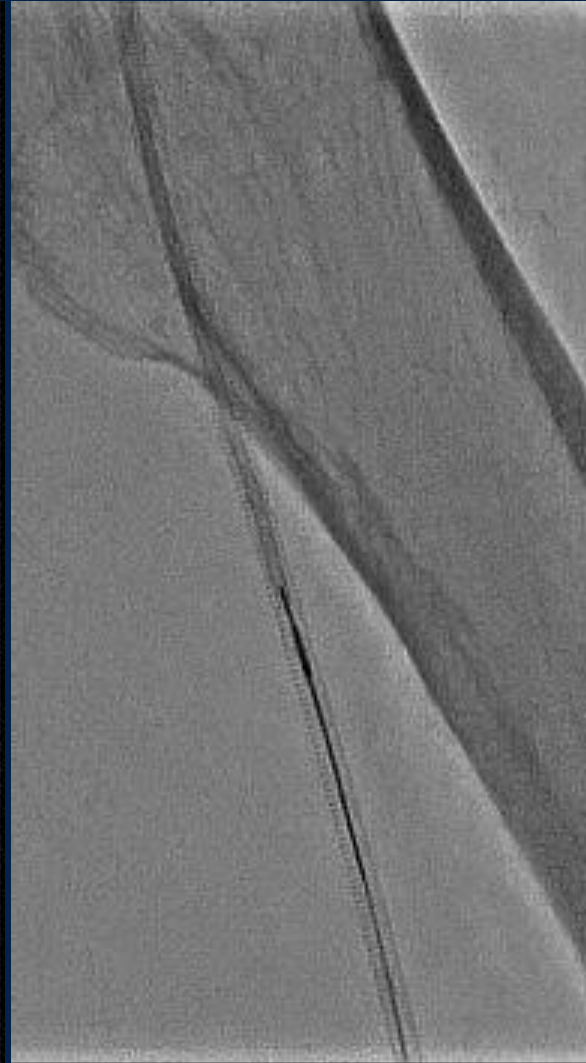
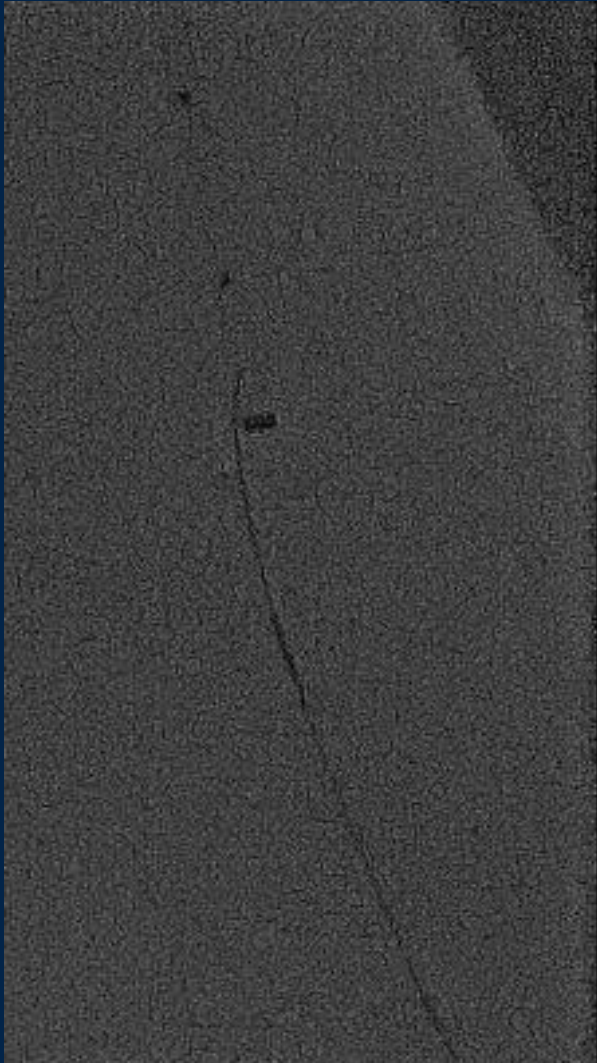
- Lt. popliteal artery micropuncture → 018" Commna





# Wire passage through the antegrade sheath

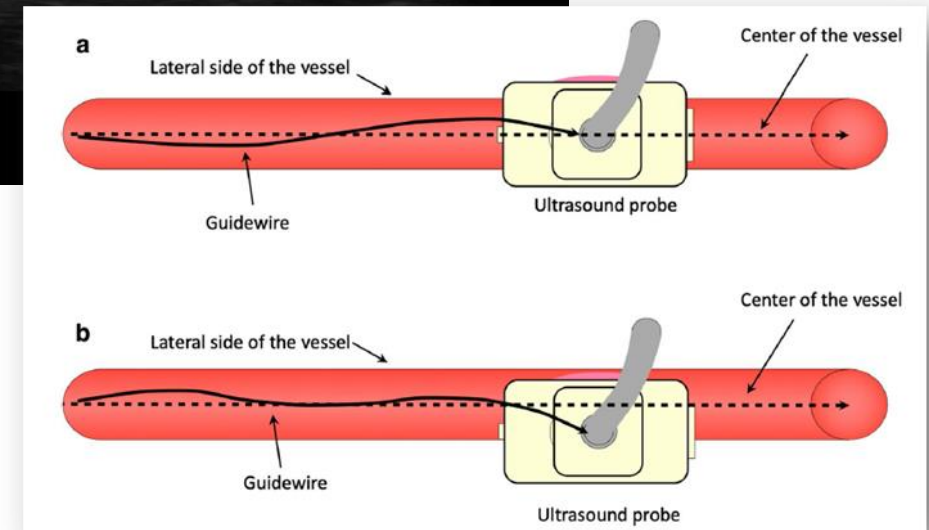
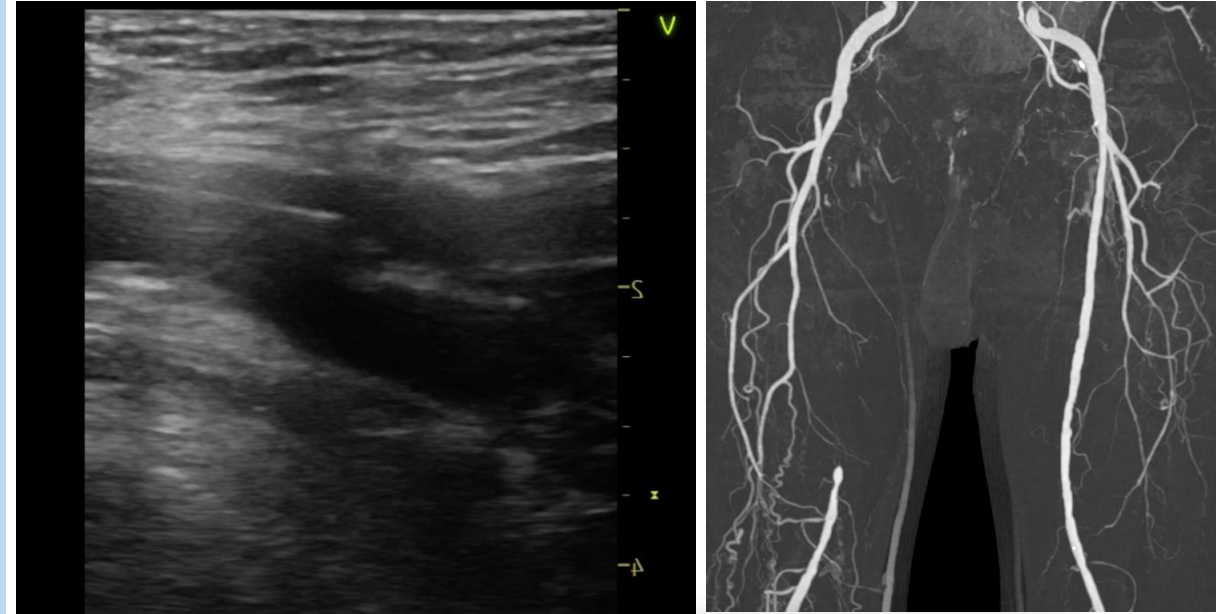
- Retrograde approach: 018" Command G/W + 18 CXI Catheter
- -> Wiring to 6Fr Fortress catheter & 4Fr Glidecath



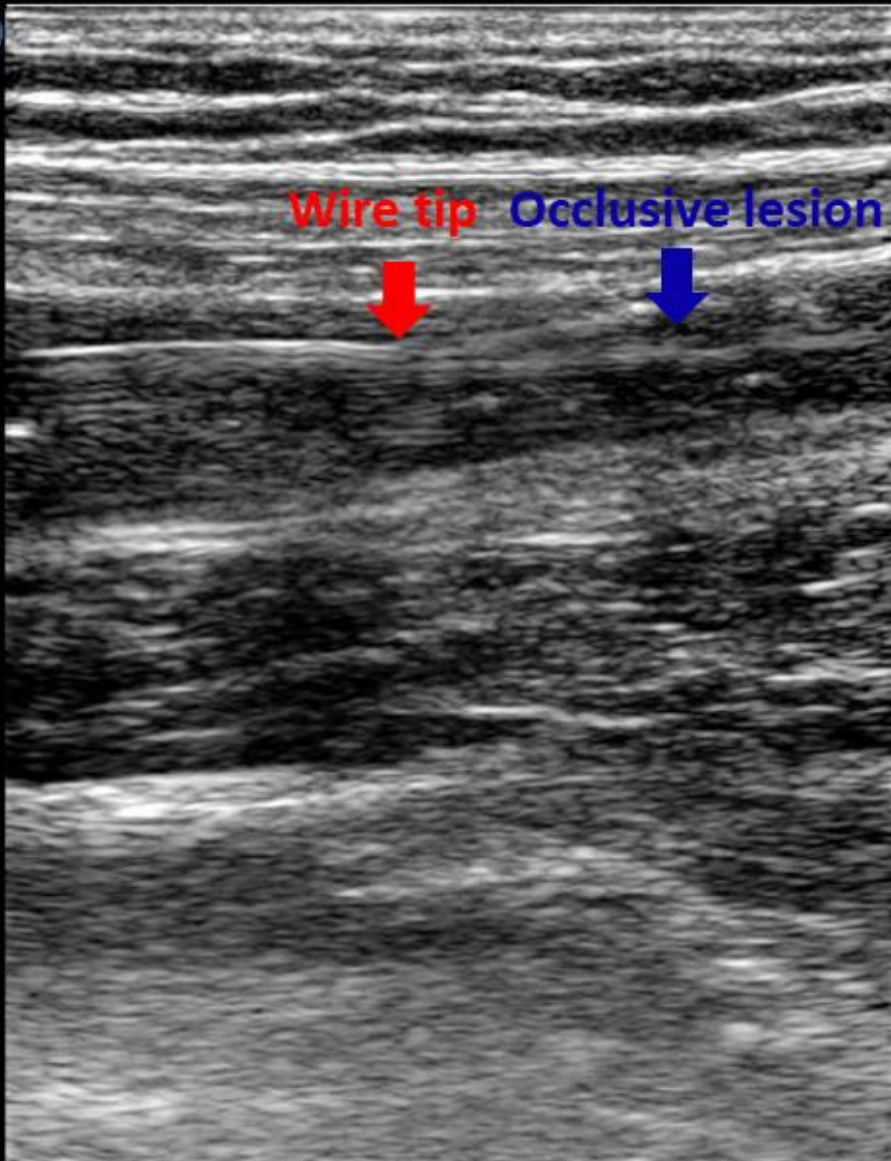
# Extravascular ultrasound guidance (EVUS) CTO crossing

## My Strategy for EVUS guided wiring

- Pre-procedural ultrasound evaluation
  - 1<sup>st</sup> assistant or sonographer
- Sufficient backup supporting guiding sheath
- Guiding catheter can supply more support
- Microcatheter with hard tip 014 GW (Astato 40g)
- Longitudinal/Crosssection alternative tracing
- Resistance + - dSFA wire guided tracing
- Radiation free procedure
- IVUS can be additive effect, if possible
- Learning curve > 10 cases

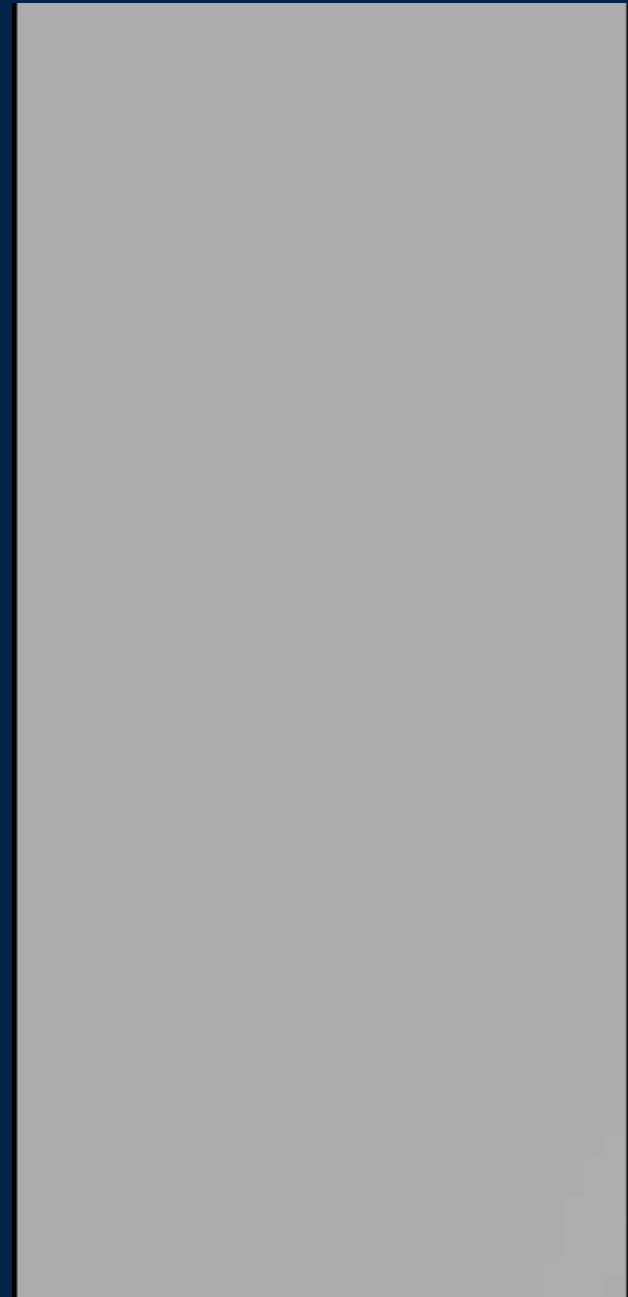
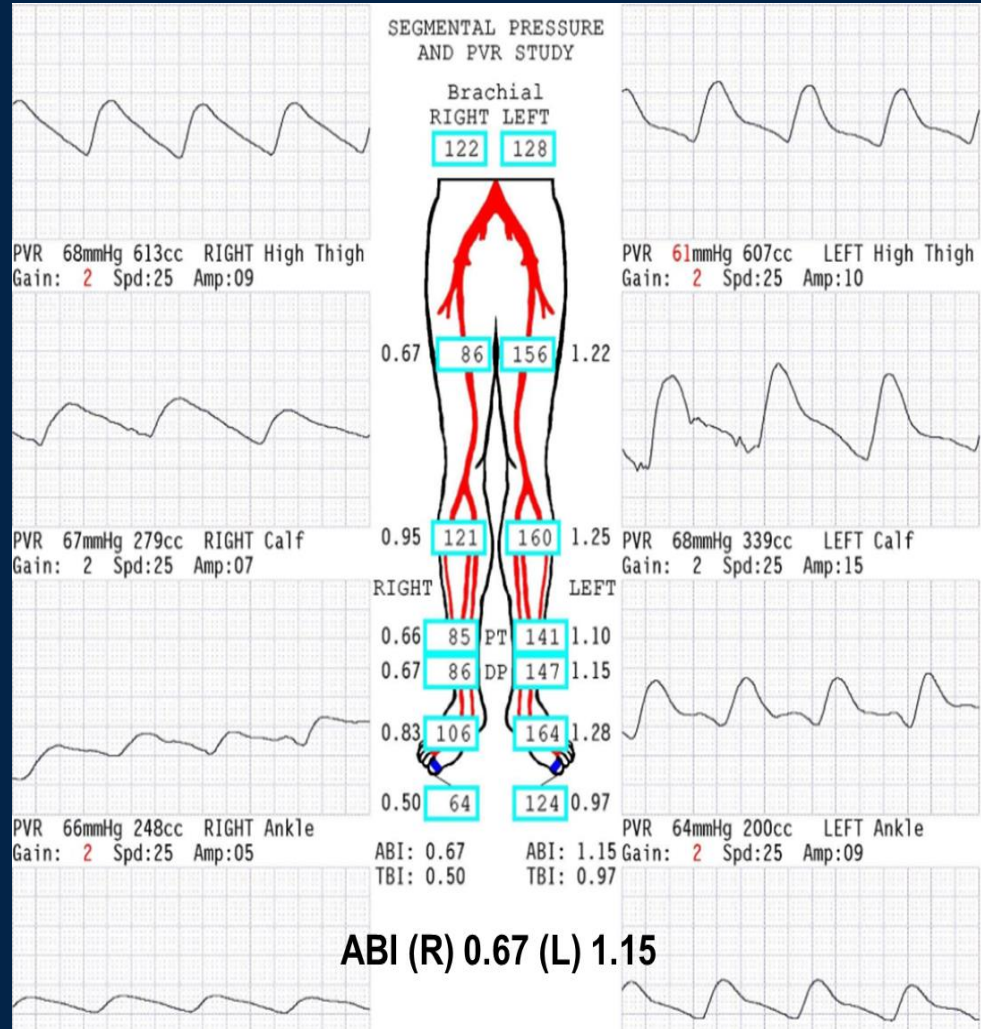


# Ultrasound Guided PTA



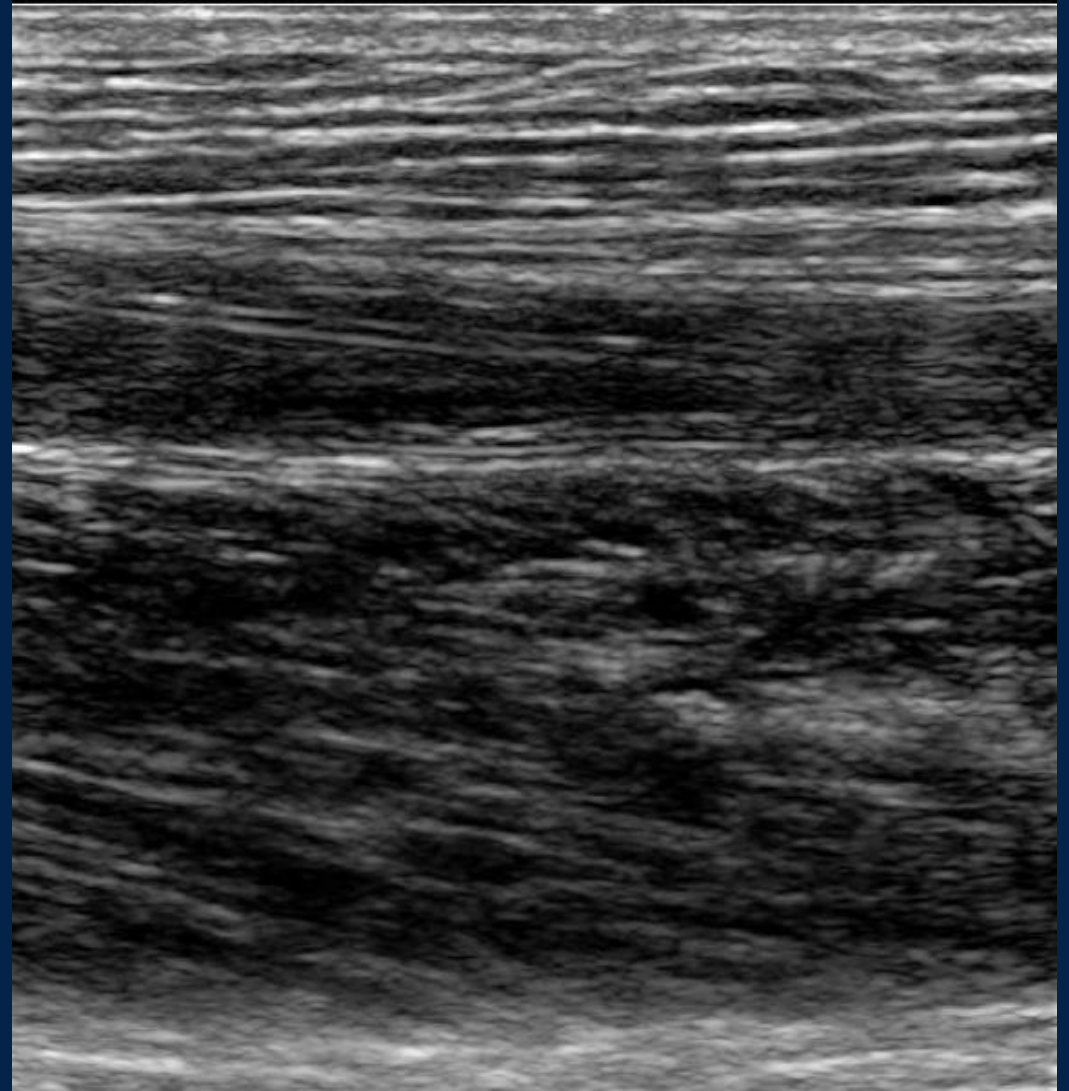
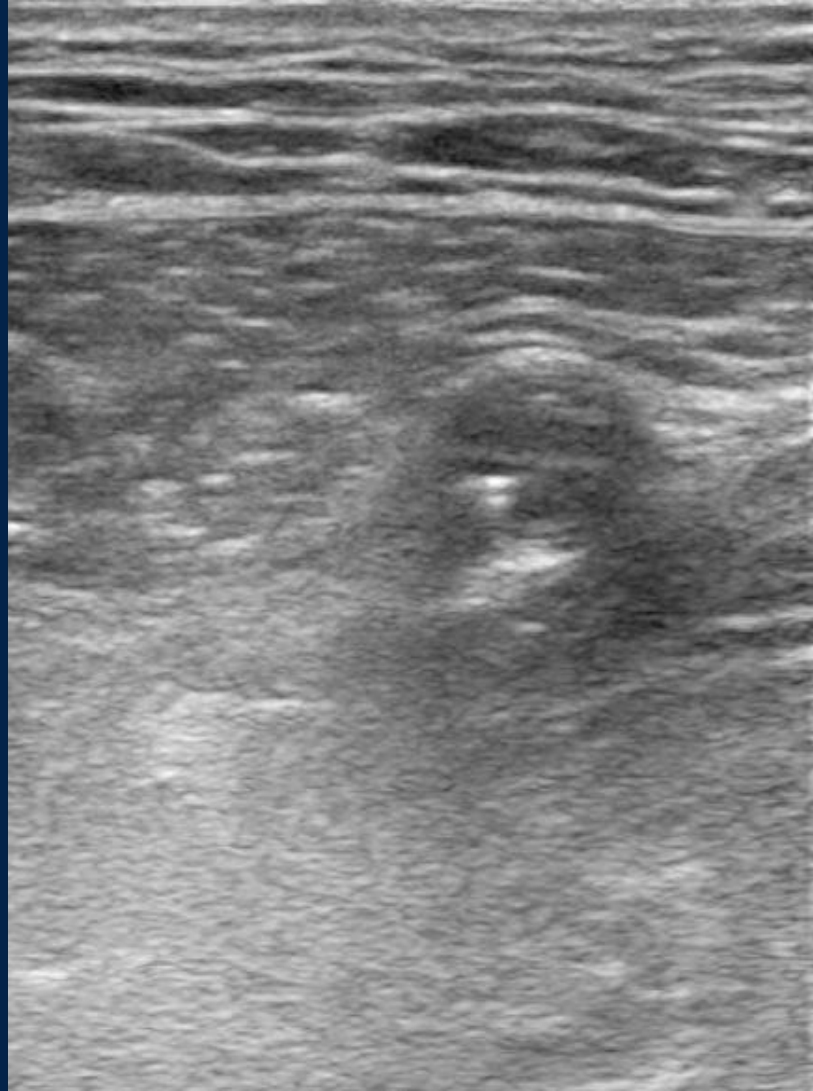
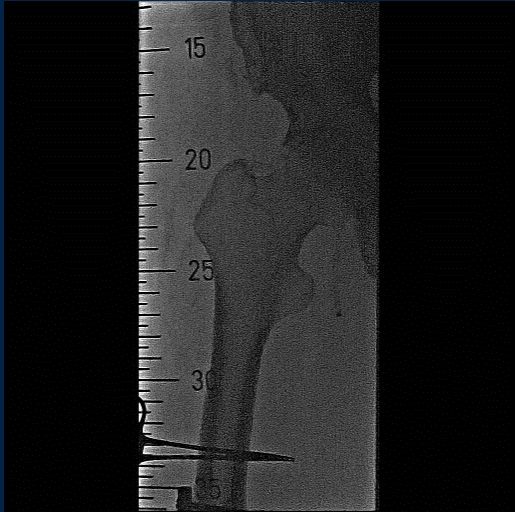
- *Strong backup support by Guiding sheath/catheter*
- *Microcatheter based true lumen wiring*
- *Step by step advancement only guided by ultrasound*
- *Repetative Longitudinal / cross-sectional imaging*

# M/69 – RC 2 claudicant



Occlusion of Rt.SFA

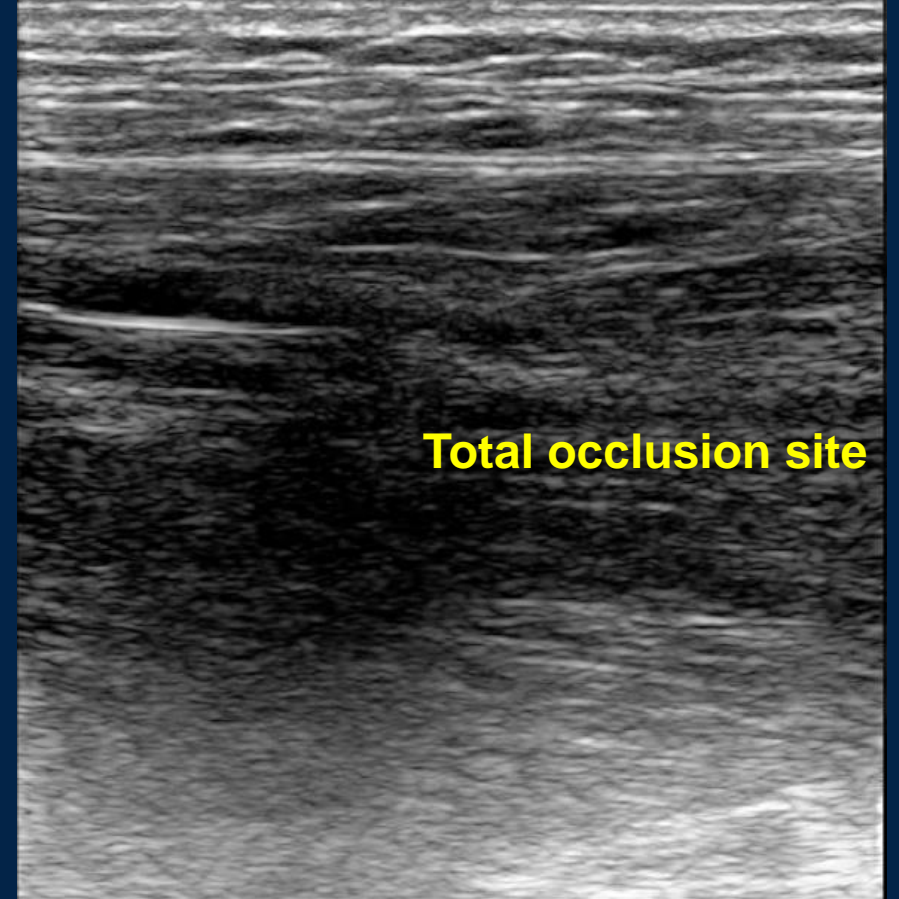
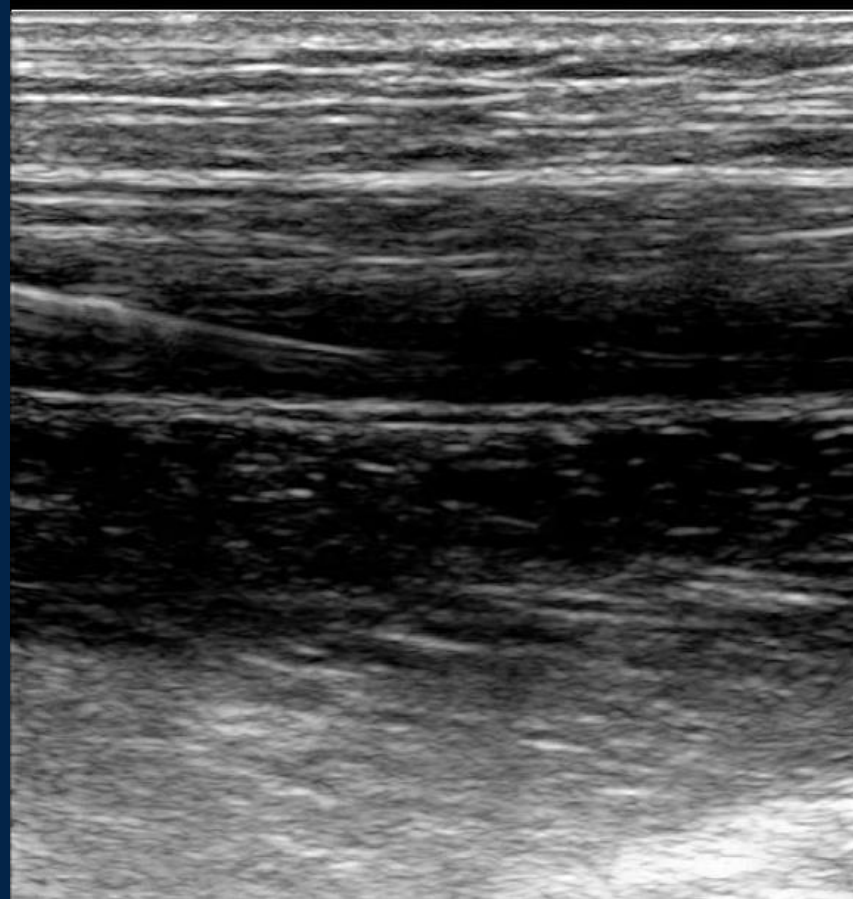
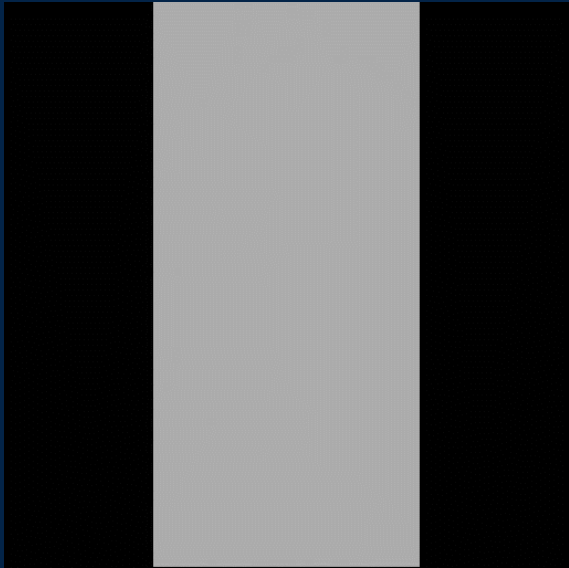
# US-guided wiring



Occlusion site marking

Rubicon 0.018" + ASAHI Astatto XS 40

# US-guided wiring



# US-guided wiring

PHILIPS KIM SANG MAN 09/06/2019 09:32:54AM TIS0.5 MI 1.3  
8004357 L11-3/Carotid

FR 39Hz  
4.0cm

2D  
58%  
C 50  
P Low  
Pen

G  
P R

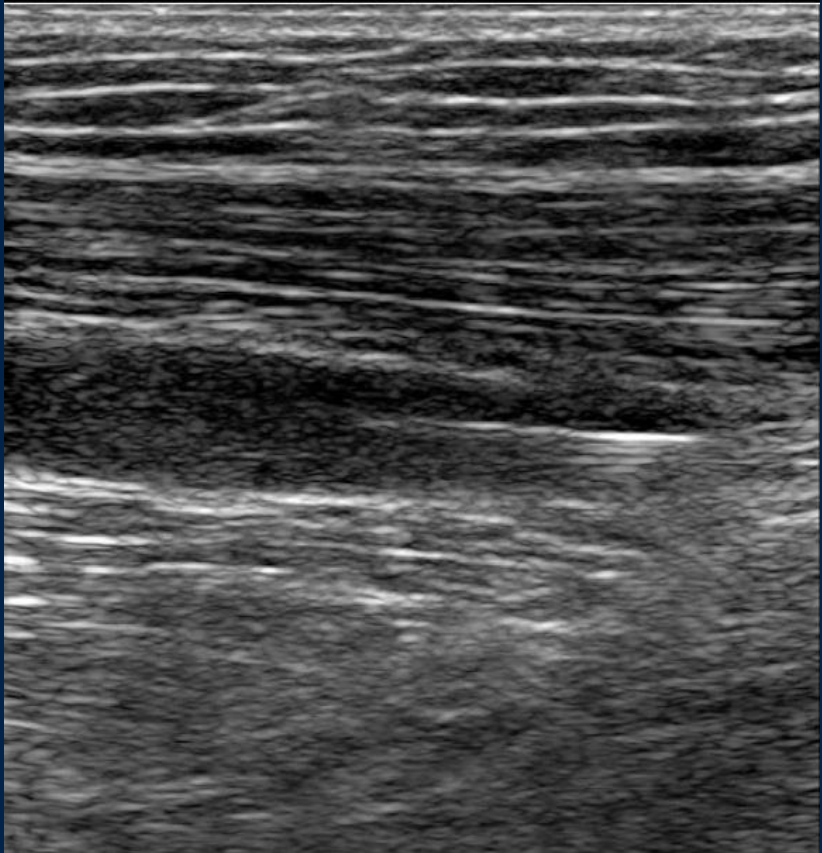
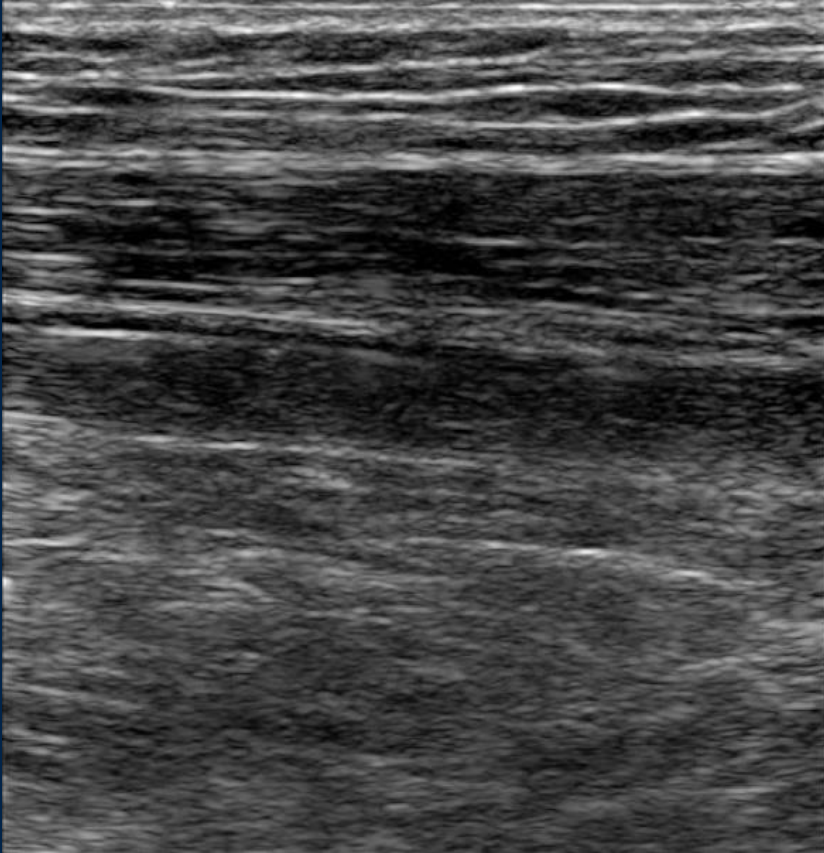


M4

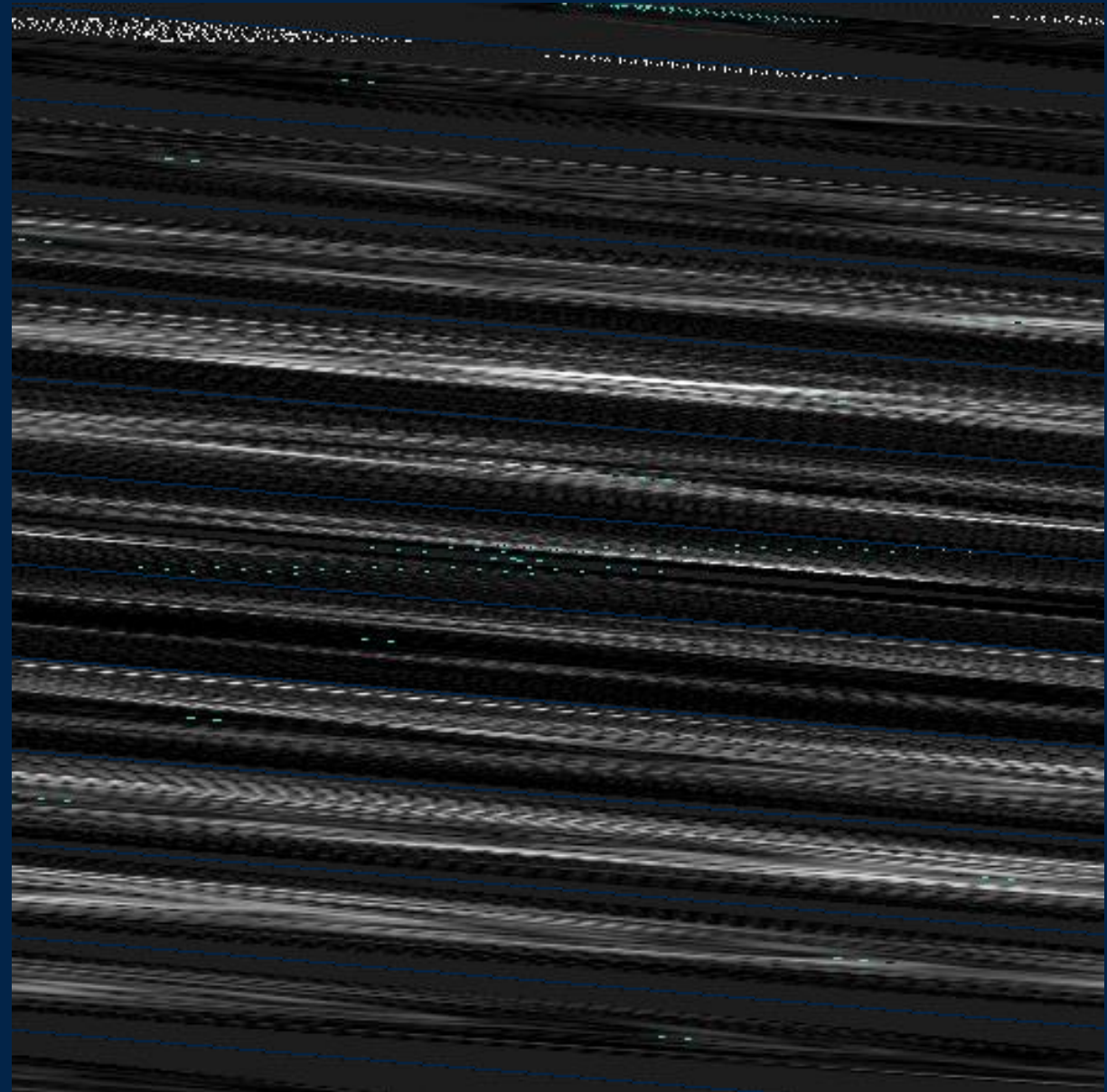
JPEG

\*\*\* bpm

This block contains a small ultrasound image with various technical parameters and a directional diagram. The parameters include patient name (KIM SANG MAN), date (09/06/2019), time (09:32:54AM), and location (L11-3/Carotid). Technical settings include FR 39Hz, 4.0cm depth, 2D mode, 58% strain, C 50, P Low, and Pen. A directional diagram shows G (Gonion), P (Posterior), and R (Right). A vertical scale bar on the right is labeled M4. The image is in JPEG format and has a frame rate of \*\*\* bpm.



# IVUS-guided rewiring → Atherectomy & DCB



IVUS



# Summary

- Different approach according to the lesion characteristics
- Learning curve & experience would be needed in SFA CTO penetration in any methods
- Less injured technique for further procedure chance
- Time/Radiation/Operator's fatigue should be considered
- Let's try for SFA CTO penetration !!