

Approach & Strategy for Complex & CTO Femoropopliteal Disease

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Classification of Fem-pop lesions

– TASC 2007

TASC A

1. Single stenosis 10cm long (3cm)
2. Single occlusion 5cm long (*C in 2000*)

TASC B

1. Multiple lesions (stenosis or occlusions), each 5cm (3cm)
2. Single stenosis or occlusion 15cm not involving infra geniculate popliteal (*C or D in 2000*)
3. Single/multiple lesions in absence of continuous tibial vessels to improve inflow for a distal bypass
4. Heavily calcified occlusion 5cm long
5. Single popliteal stenosis

Classification of Fem-pop lesions

– TASC 2007

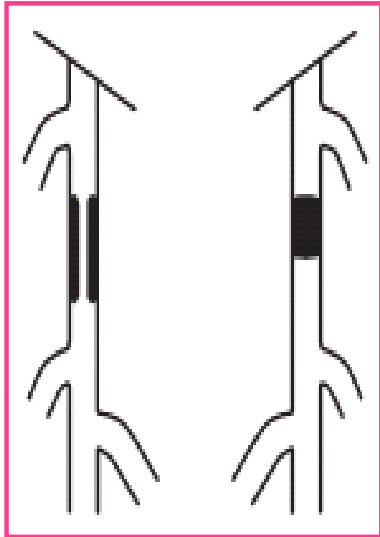
TASC C

1. Multiple stenoses or **occlusions totaling >15cm** with or without heavy calcification (*D in 2000*)
2. Recurrent stenoses or occlusions that need treatment after 2 endovascular interventions

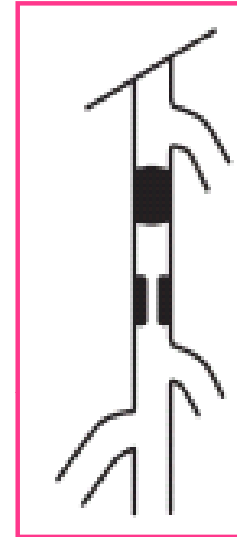
TASC D

1. CTO of CFA or SFA >20cm, involving popliteal artery
2. CTO of popliteal artery and proximal trifurcation vessels

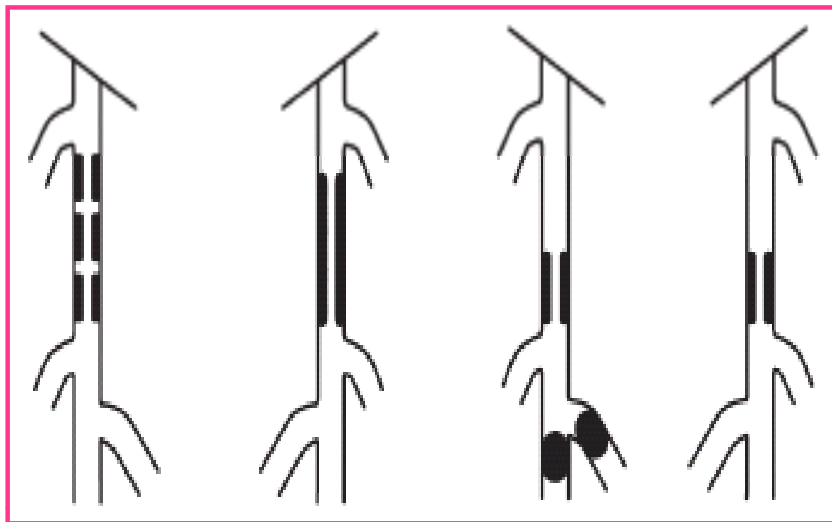
ASC Classification of Fem-Pop Lesions



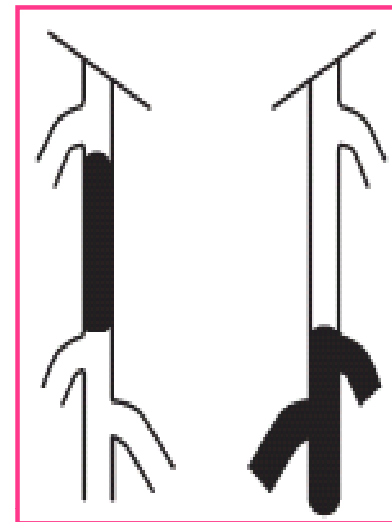
TASC A



TASC C



TASC B



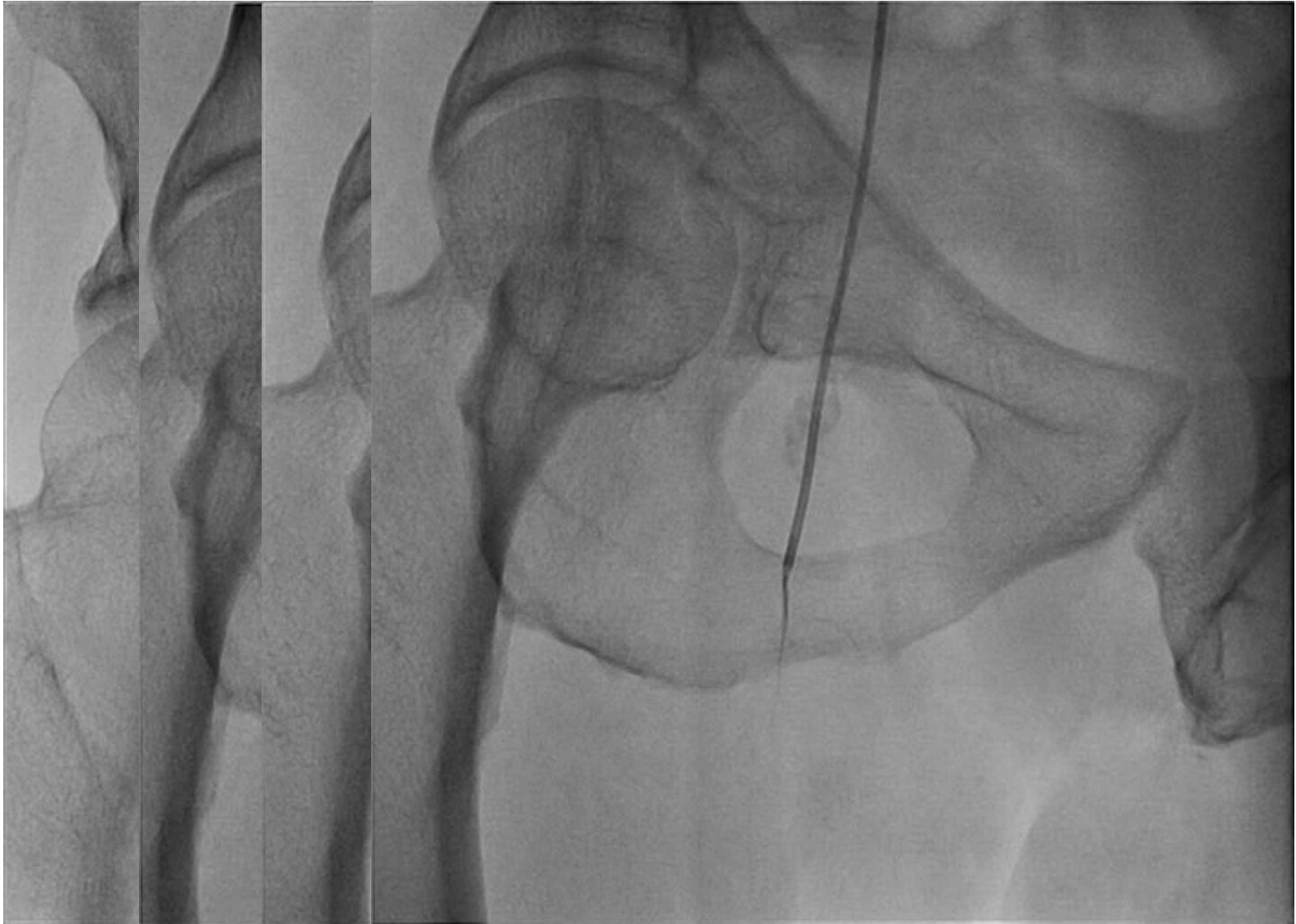
TASC D

Complicated SFA Interventions

- No visible ostium
- Heavy calcification
- Long total lesion
- Re-entering from subintima
- “To stent or Not to stent”
 - Provisional spot vs. whole length
 - No stent zone
- Outflow management; BTK

Invisible Os!

- Ipsilateral oblique projection
- CT scan image
- Symmetry; contra-lateral side



Calcification!

- Wire penetration difficulty
- Balloon/stent expansion
- Rupture

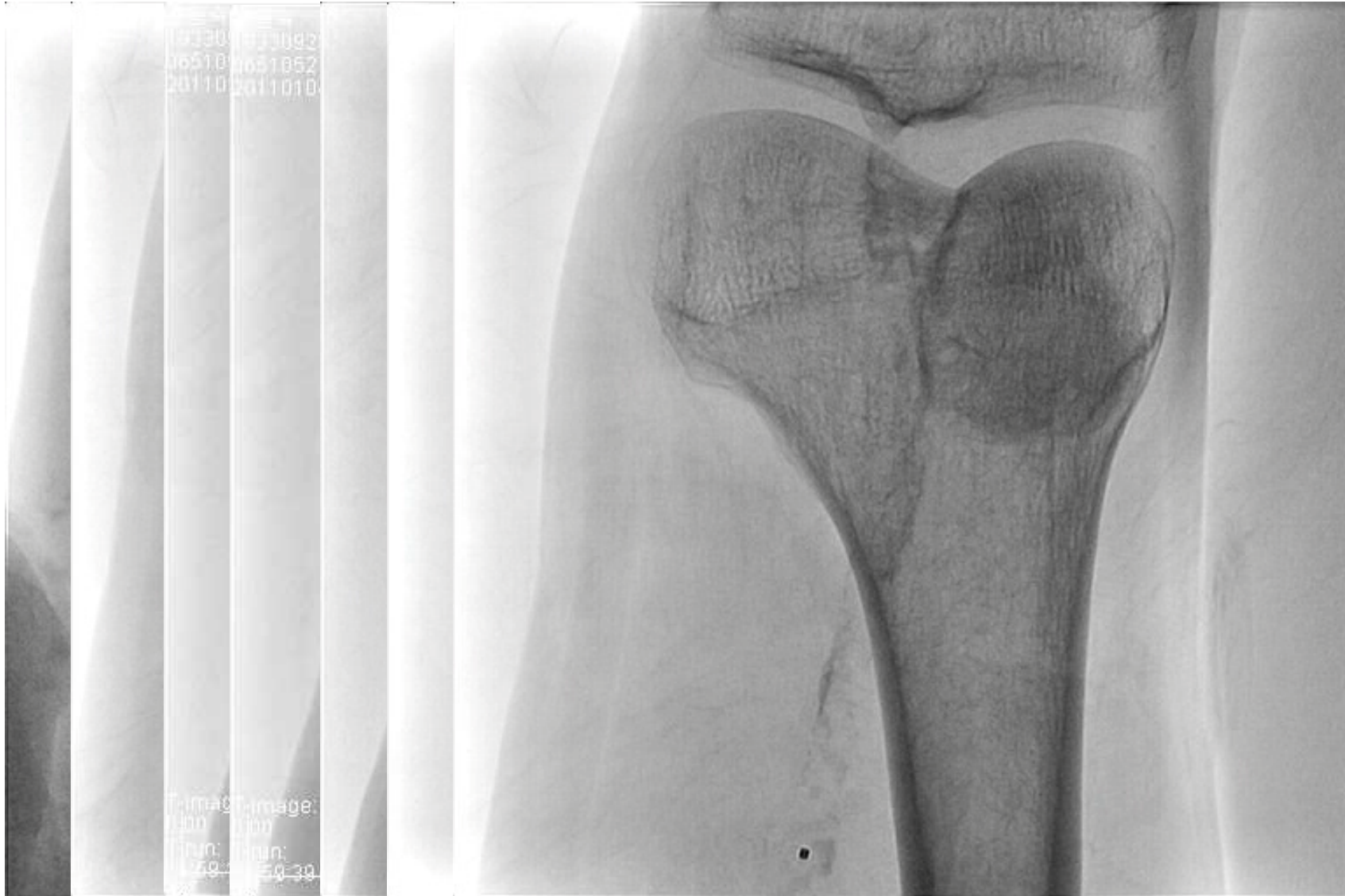
Wire Penetration?

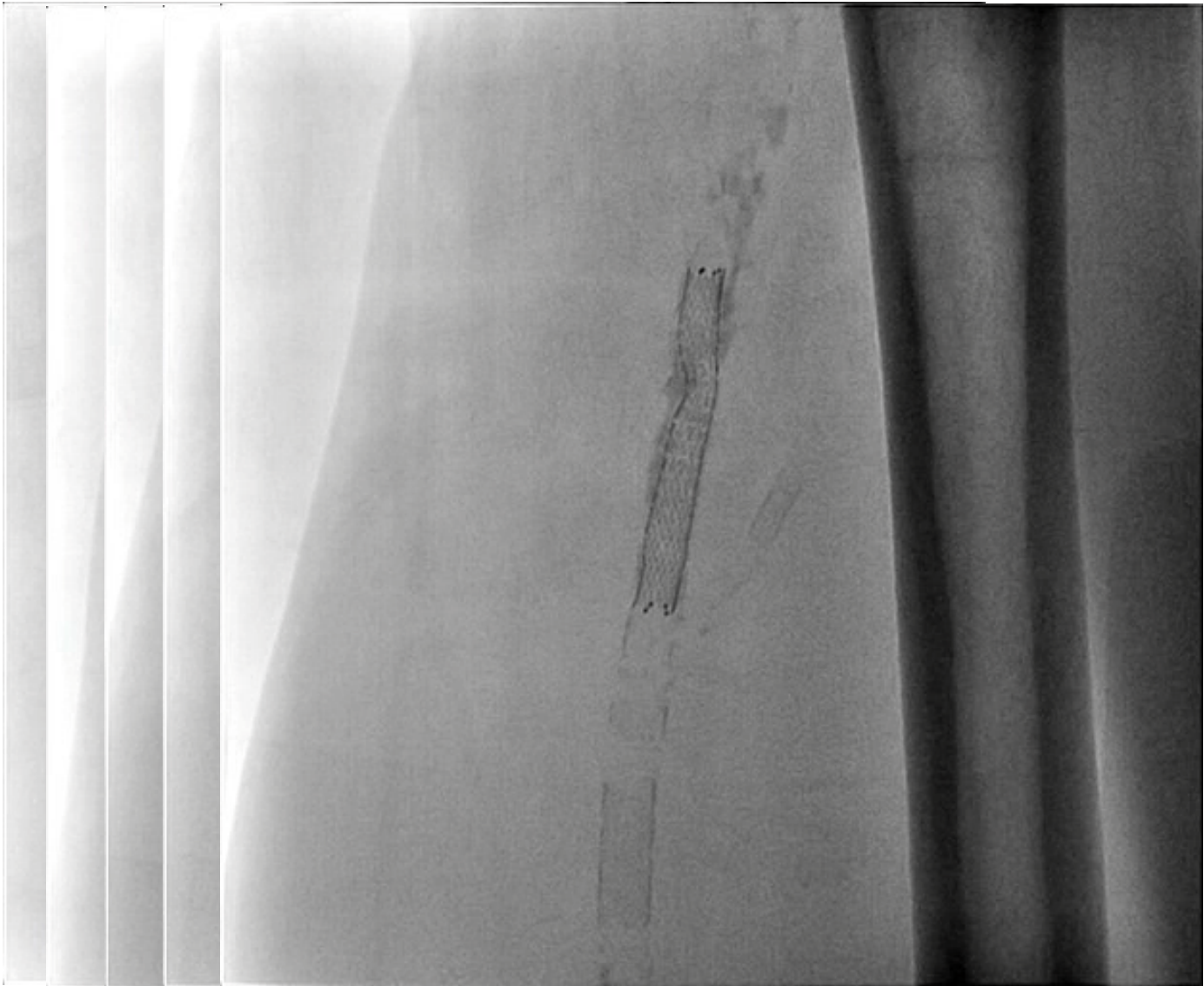
- Better back-up support
- Hard/sharp G/W, coronary G/W for CTO
- Subintimal angioplasty

Expansion/Rupture?

- Do not over-dilate
- Self-expandable stent better(?)
- Stock stent-graft

Heavy Calcification





Long CTO!

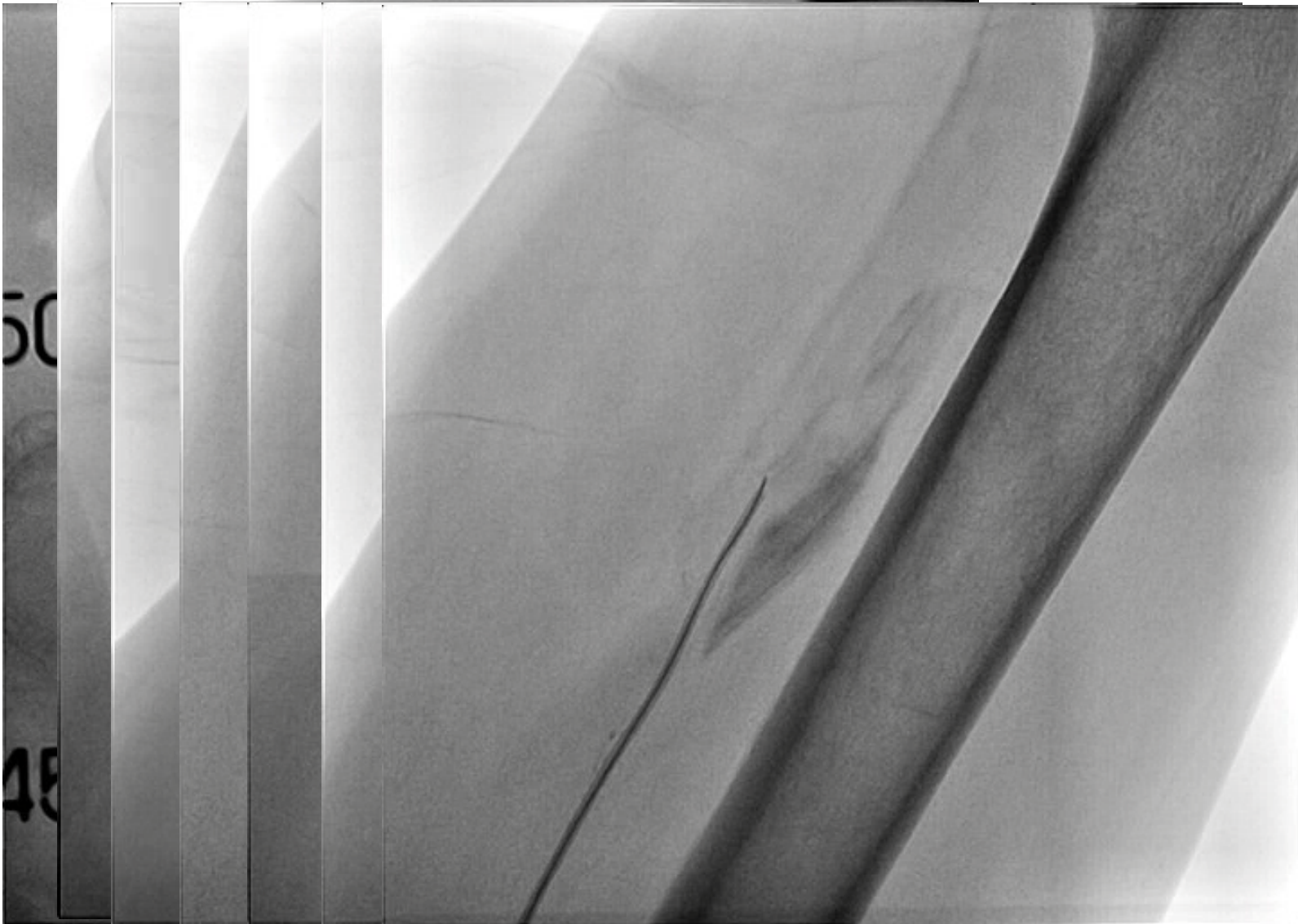
- *Penetration difficulty?*
 - Subintimal angioplasty
 - Newer device; Frontrunner XP CTO catheter
 - Hard wire
- *Long stenting?*
 - Provisional spot stenting
- *High restenosis rate?*
 - Subintimal angioplasty?
 - DES/DEB
 - Viabahn?

Subintimal approach

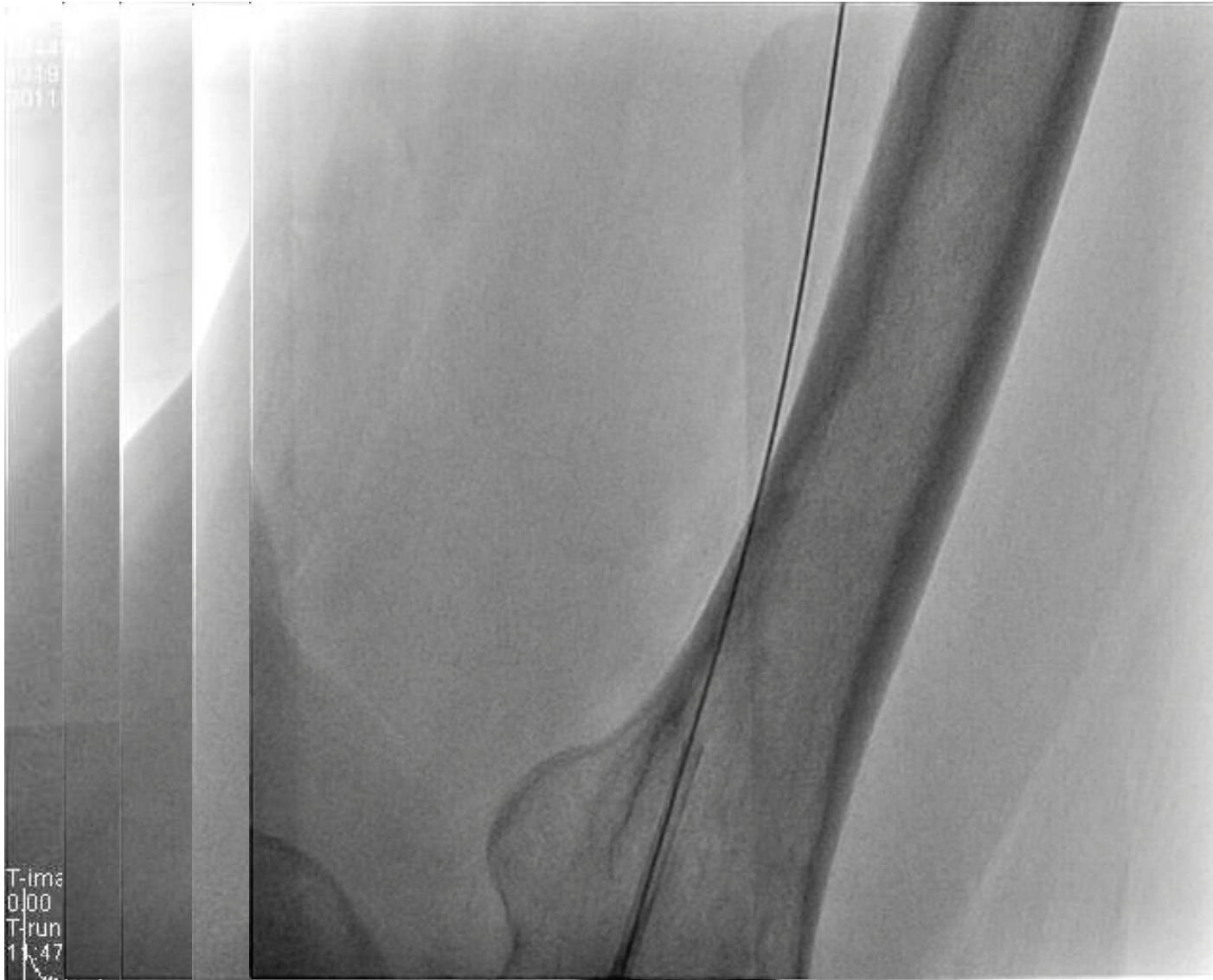


Confirm distal tibia bone position
Sudden resistance

Re-entering True Lumen



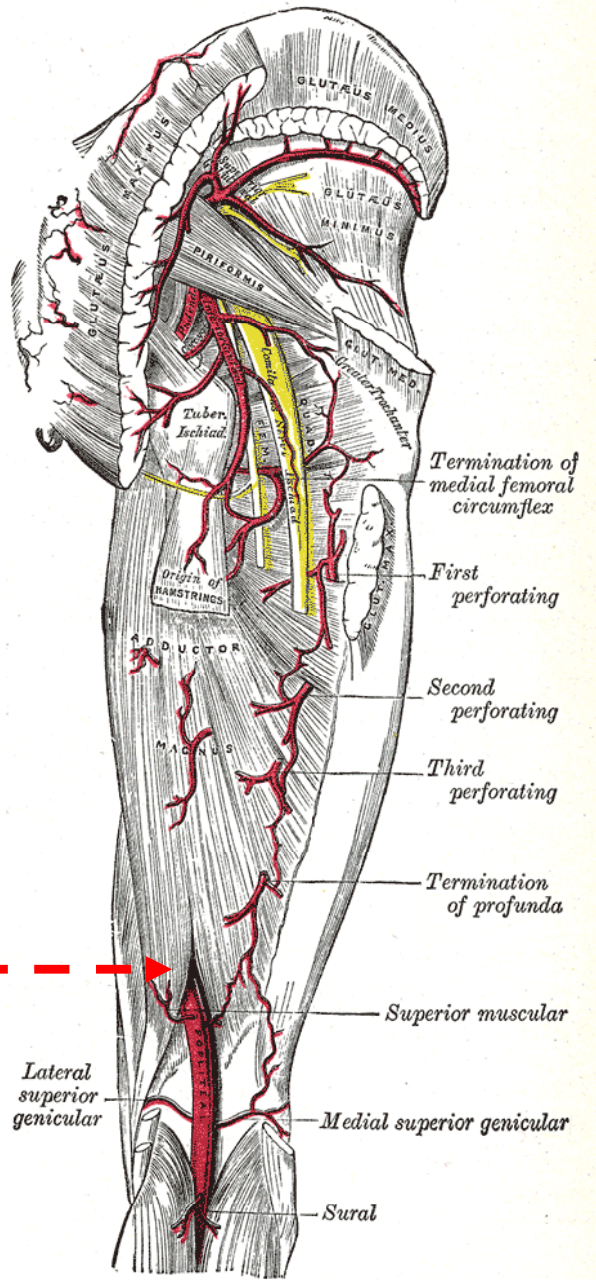
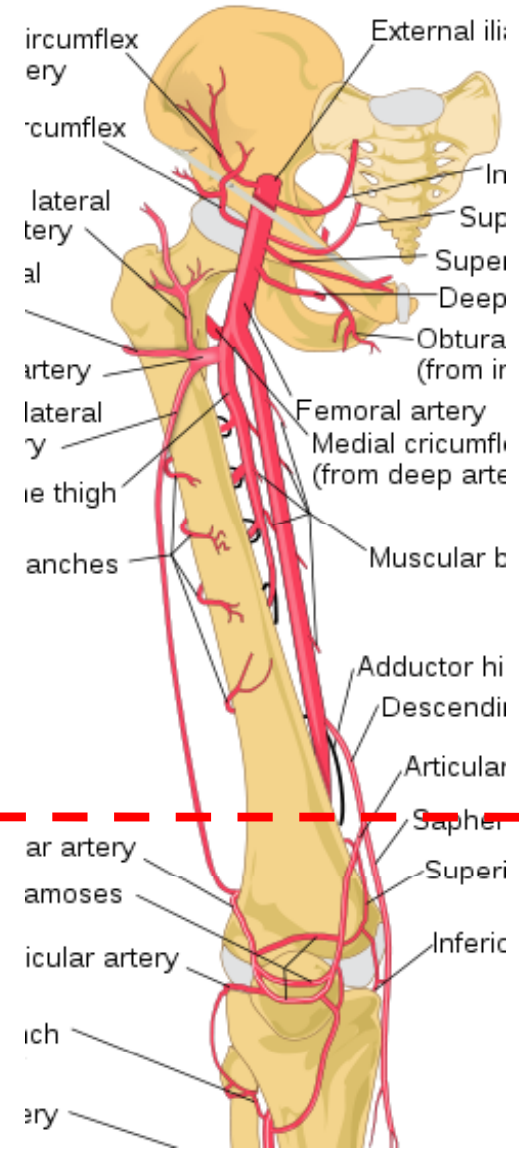
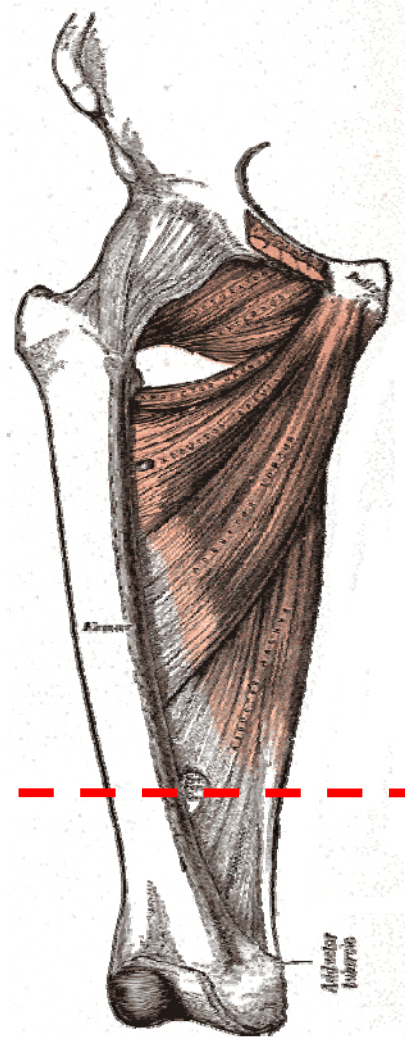
Re-entering True Lumen



External Force!

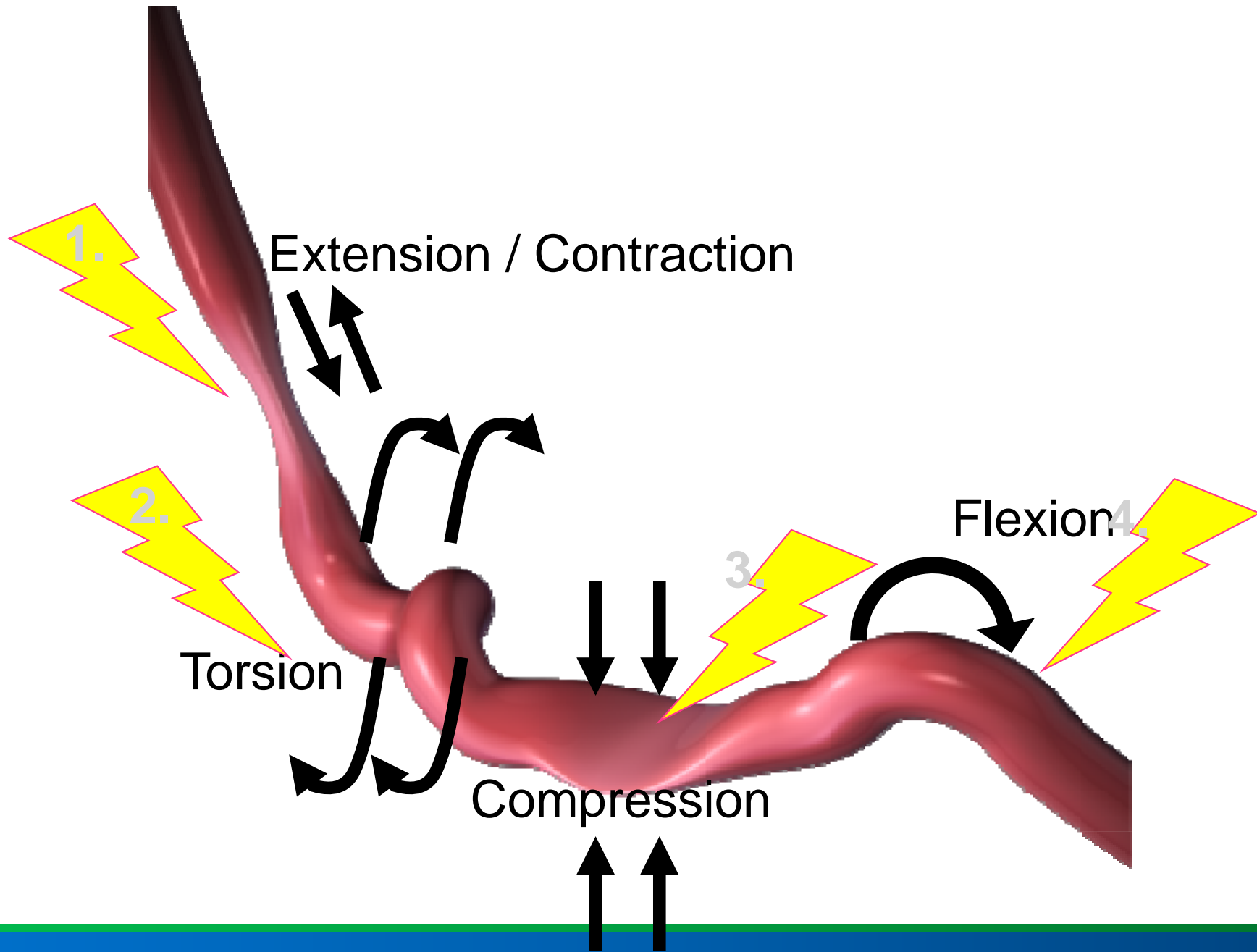
- *Stent fracture/restenosis*
- Avoid 'no-stent zone'
 - Hip joint; Acetabular fossa ~ os-SFA
 - Knee joint; Adductor hiatus ~ joint space(?)
 - Subintimal crossing better
- Newer flexible stent?

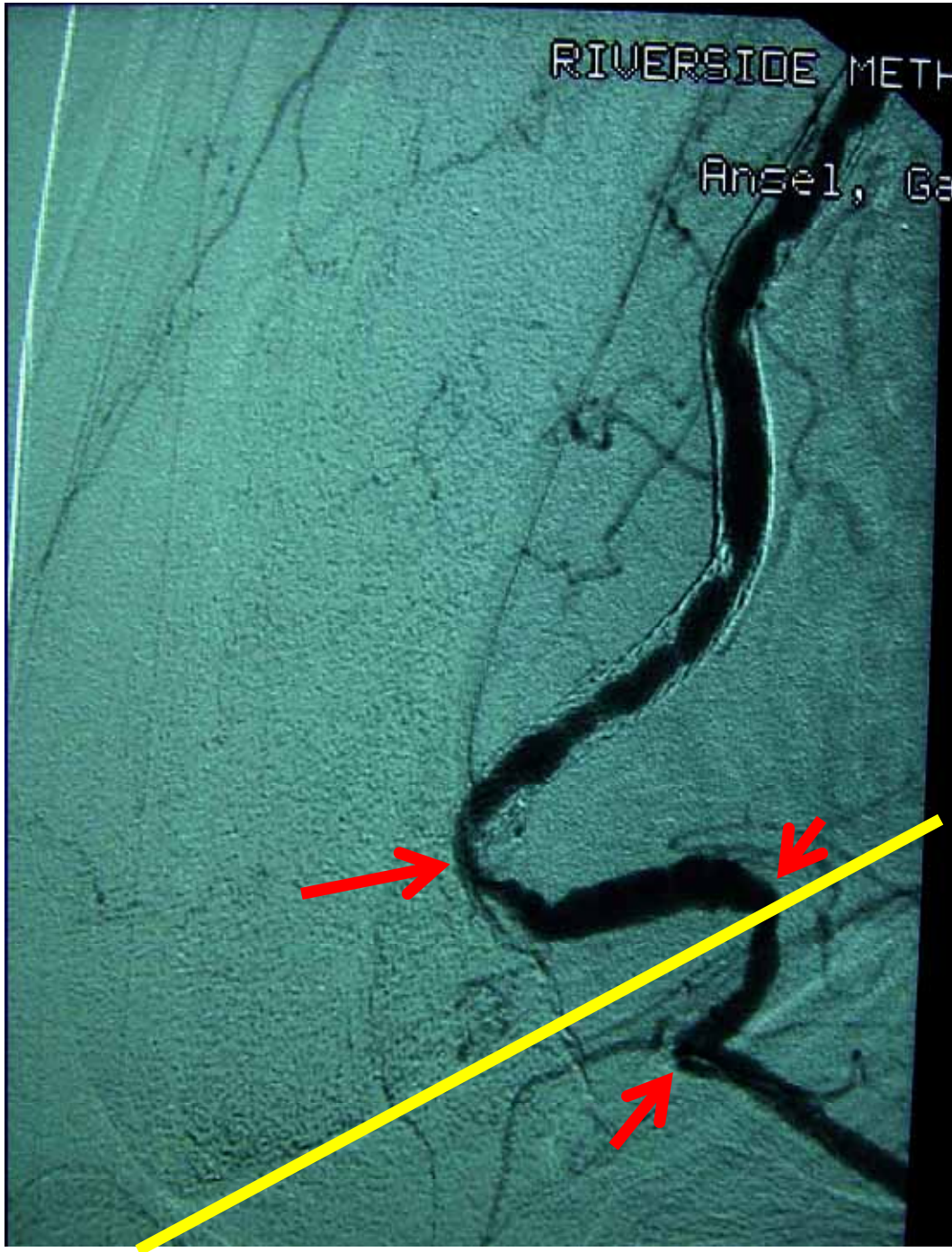
Adductor Hiatus



Posterior View

Forces Exerted in SFA





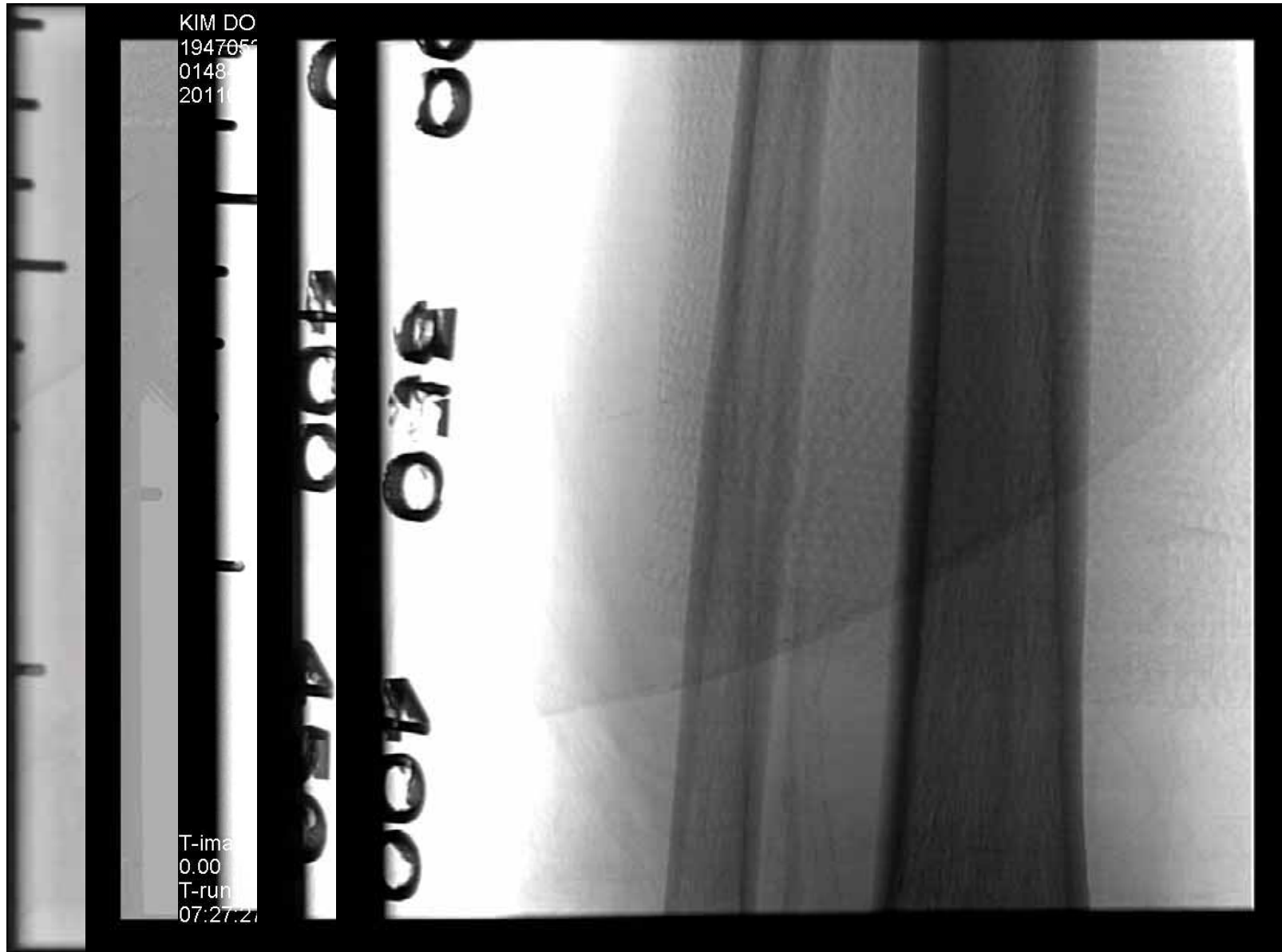
Flextion point

Joint space

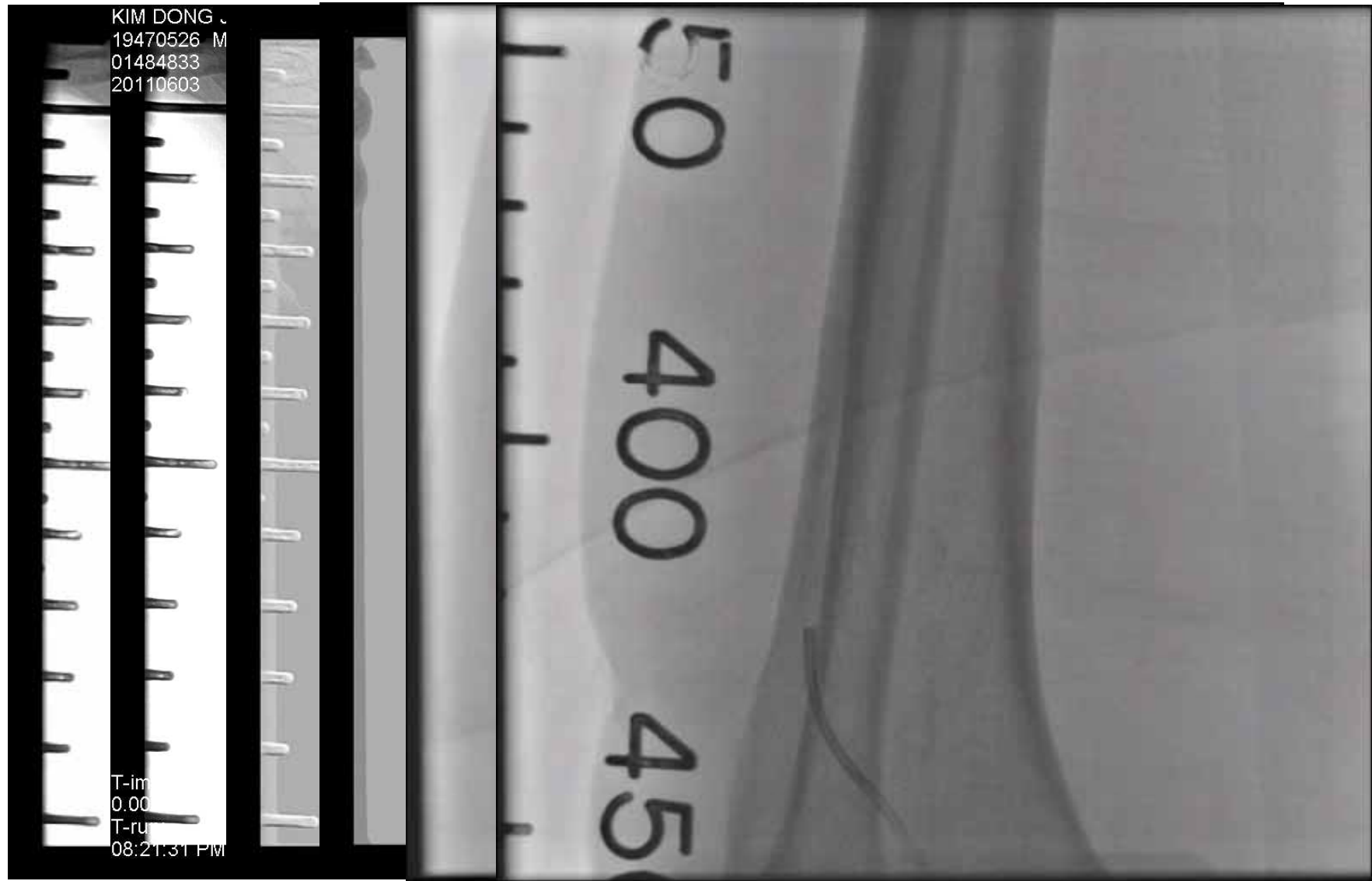


Case 3: BTK-Outflow Opening

- Male/76
- Unhealing wound of toes
- Referred from OS
- Risk factors; DM, HTN, Dyslipidemia, Smoking

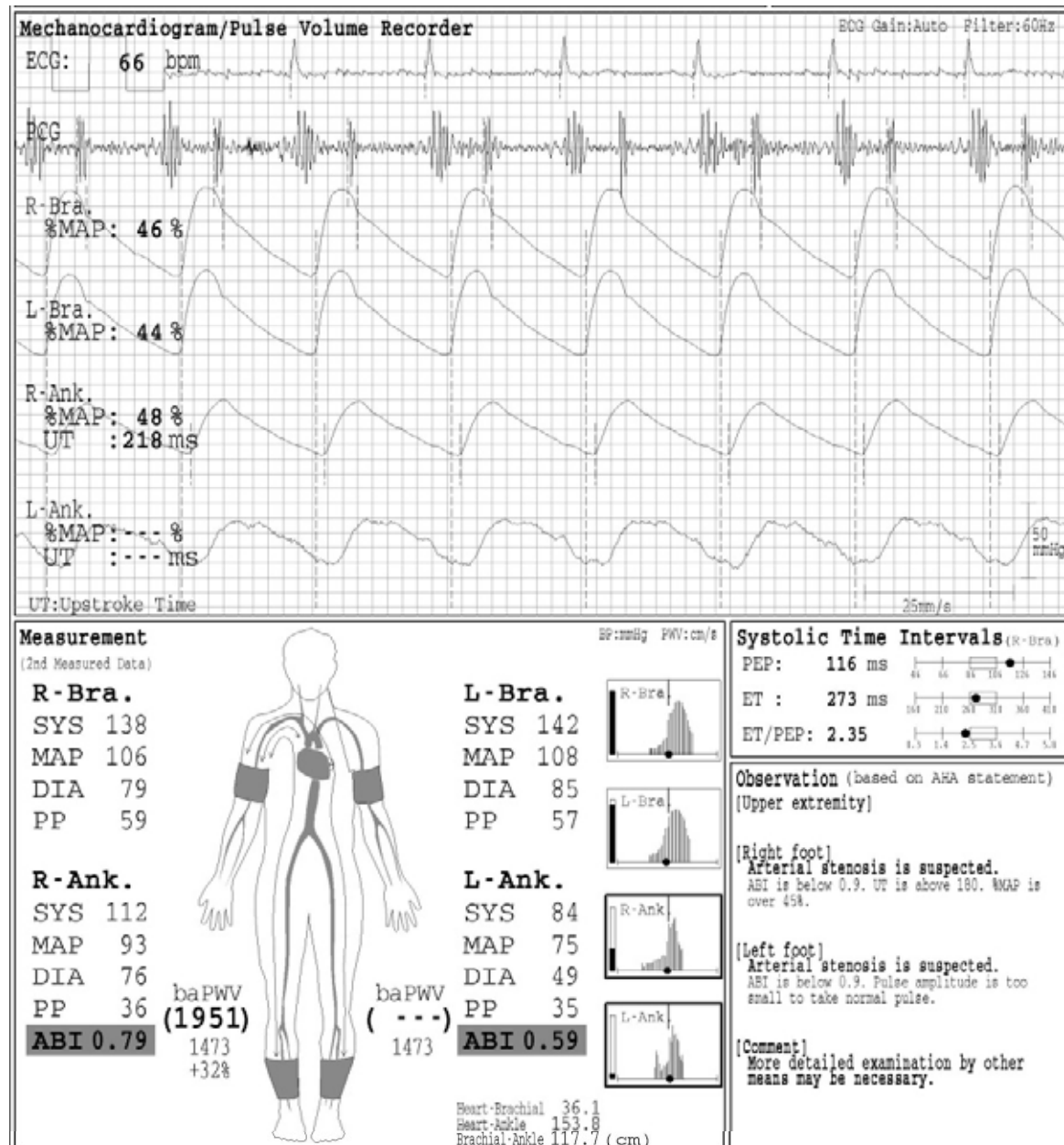


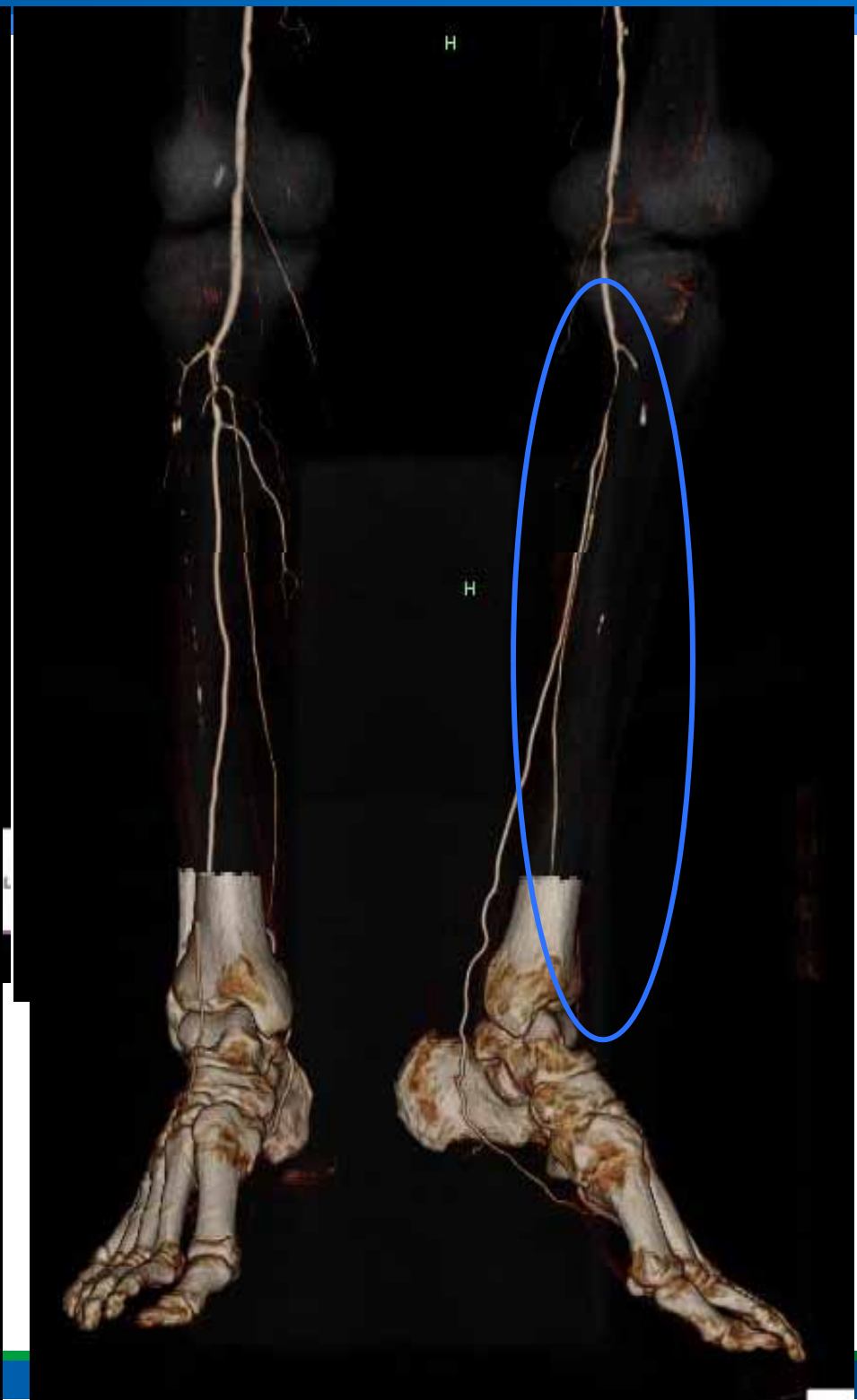
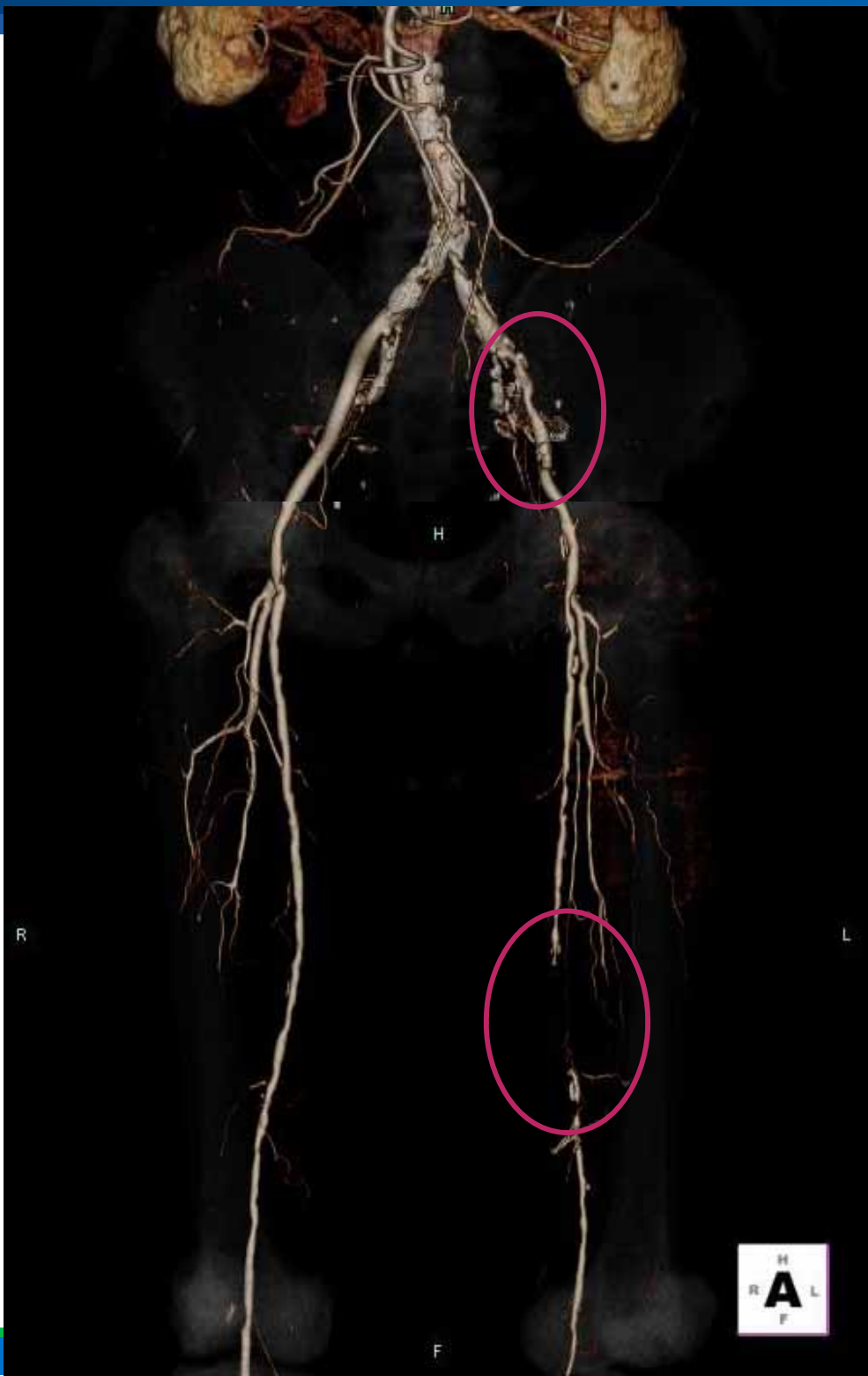
Total of Subtotal of ATG Composites at yard board is 25*150



Cordis, Sleek 2.0*60

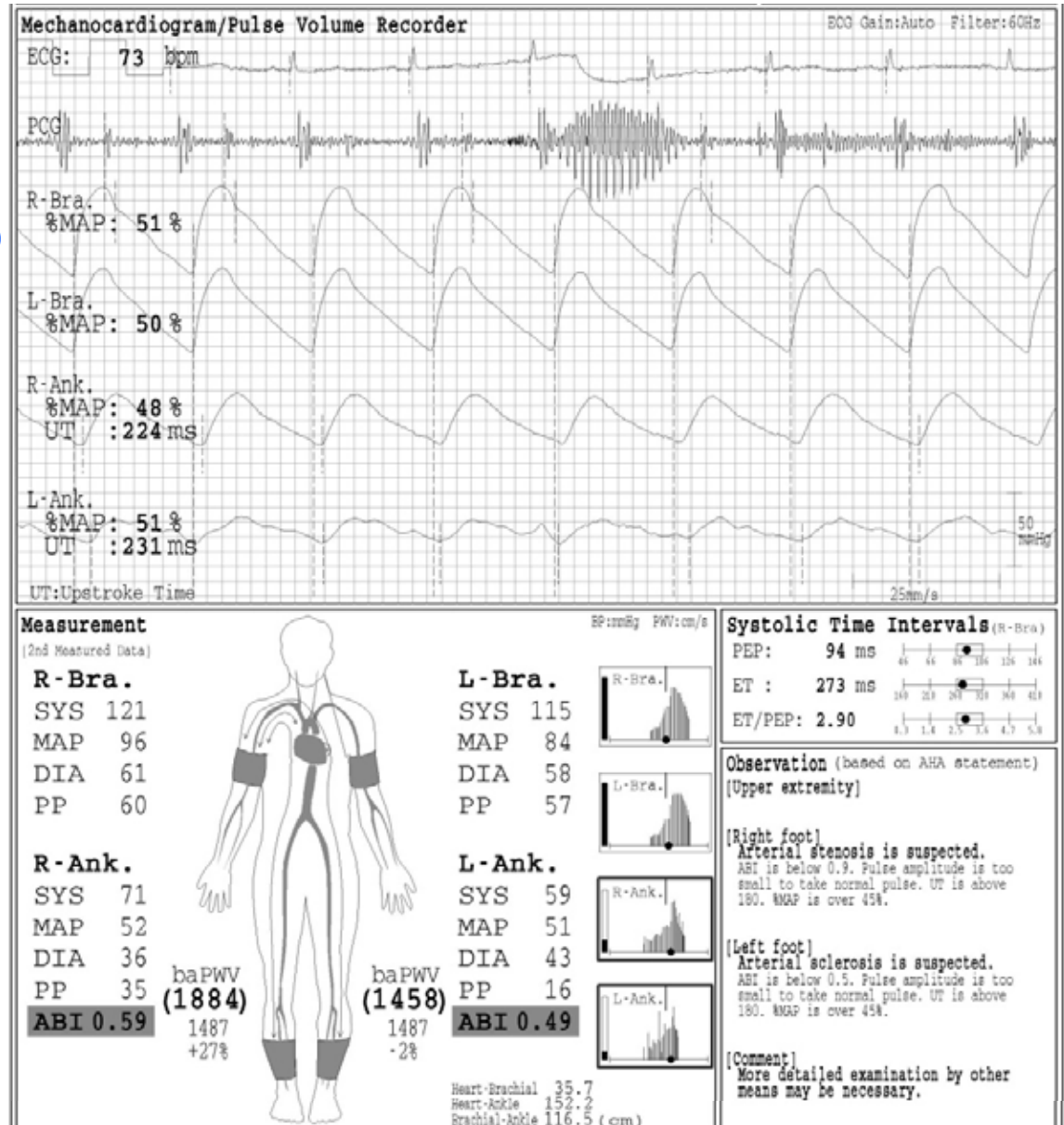
ABI; 0.79/0.59





Fem-Fem plus Fem-Pop Bypass

Worsening of pain in 1 month!



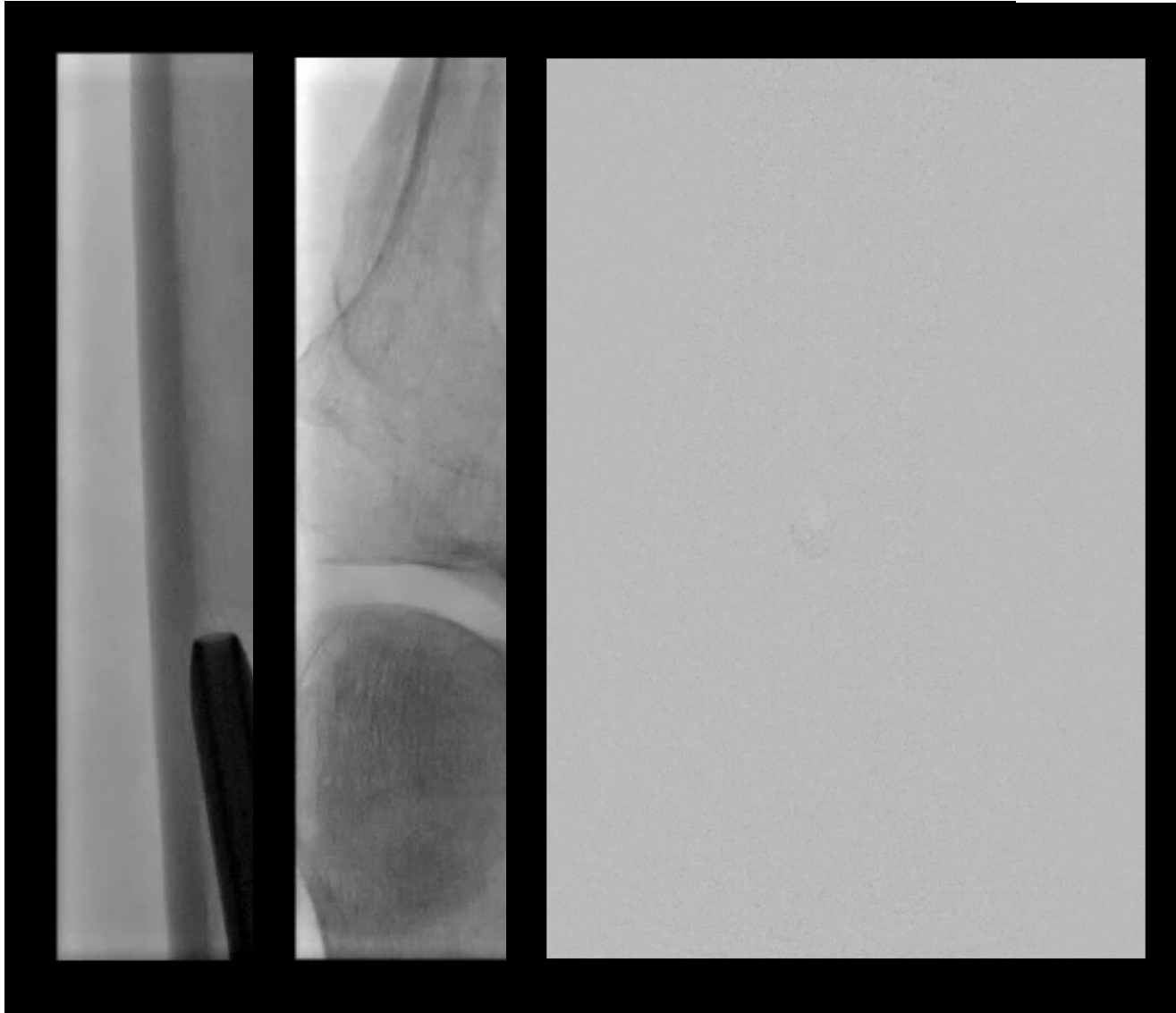


H



H

Retrograde BTK



POD7: Fem-pop graft with unhealing ulcer



Wiring to Peroneal Retrograde wiring



Antegrade
Coronary balloon-retrograde ballooning

Multi-level Angioplasty

- M/50
- Resting pain of left leg
- Claudication < 10m
- Pale palor paresthesia
- Ulcer of 1st toe





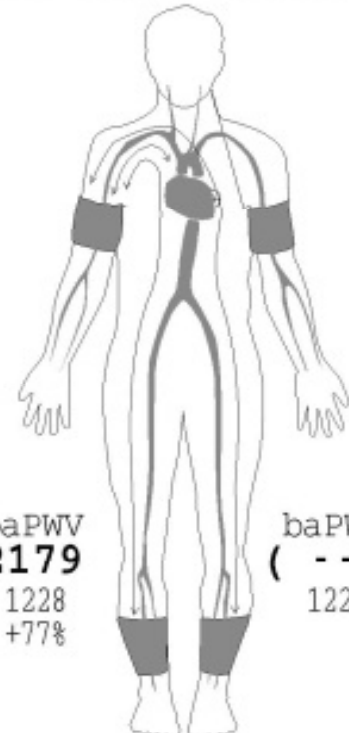
Measurement

(2nd Measured Data)

BP: mmHg PMV: cm/s

R - Bra.
 SYS 129
 MAP 106
 DIA 94
 PP 35

R - Ank.
 SYS 139
 MAP 108
 DIA 95
 PP 44
ABI 1.02

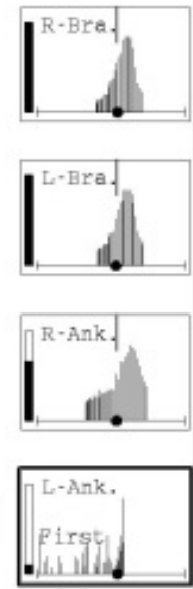


baPWV
2179
 1228
 +77%

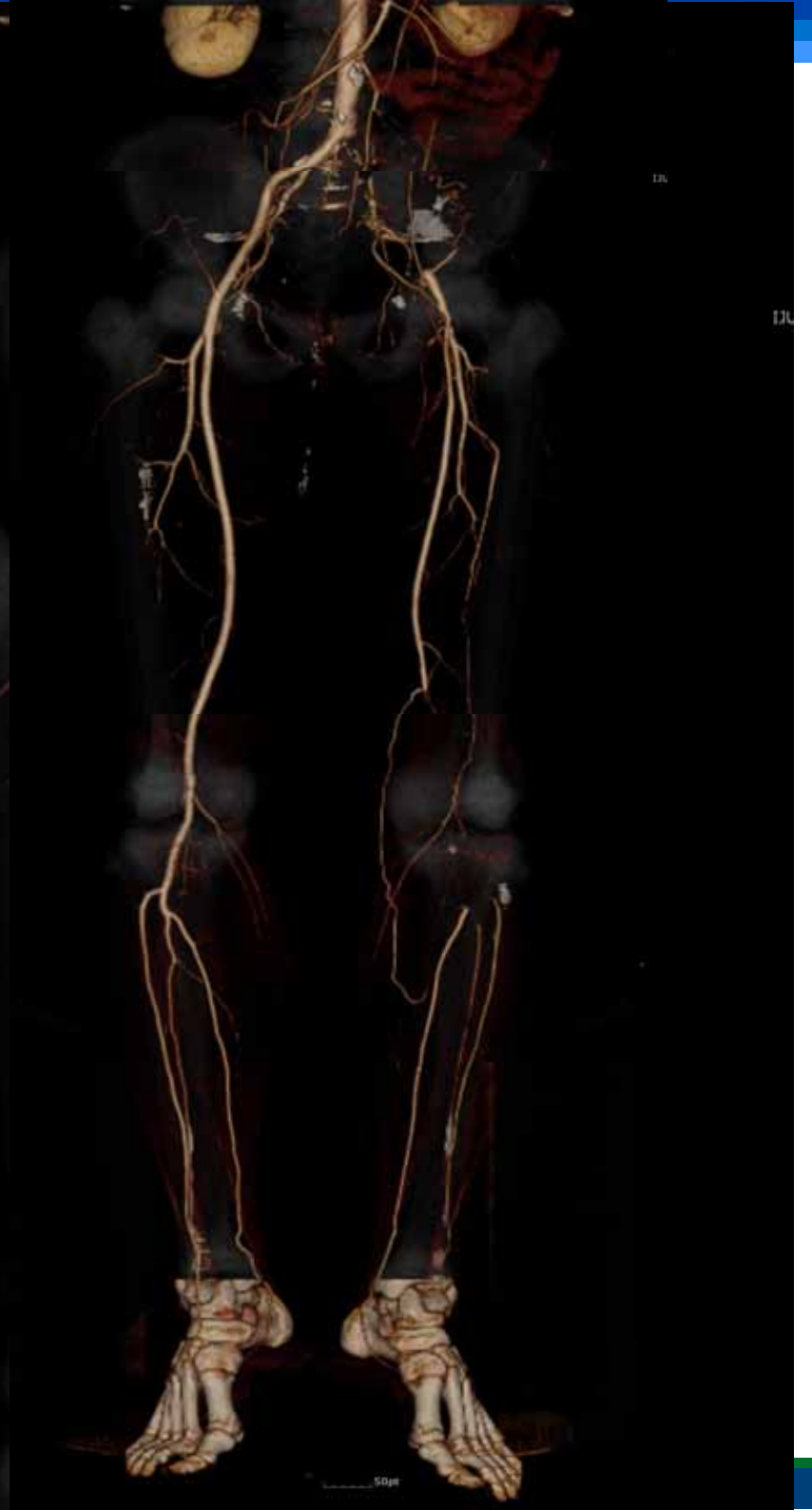
baPWV
 (---)
 1228

L - Bra.
 SYS 136
 MAP 111
 DIA 98
 PP 38

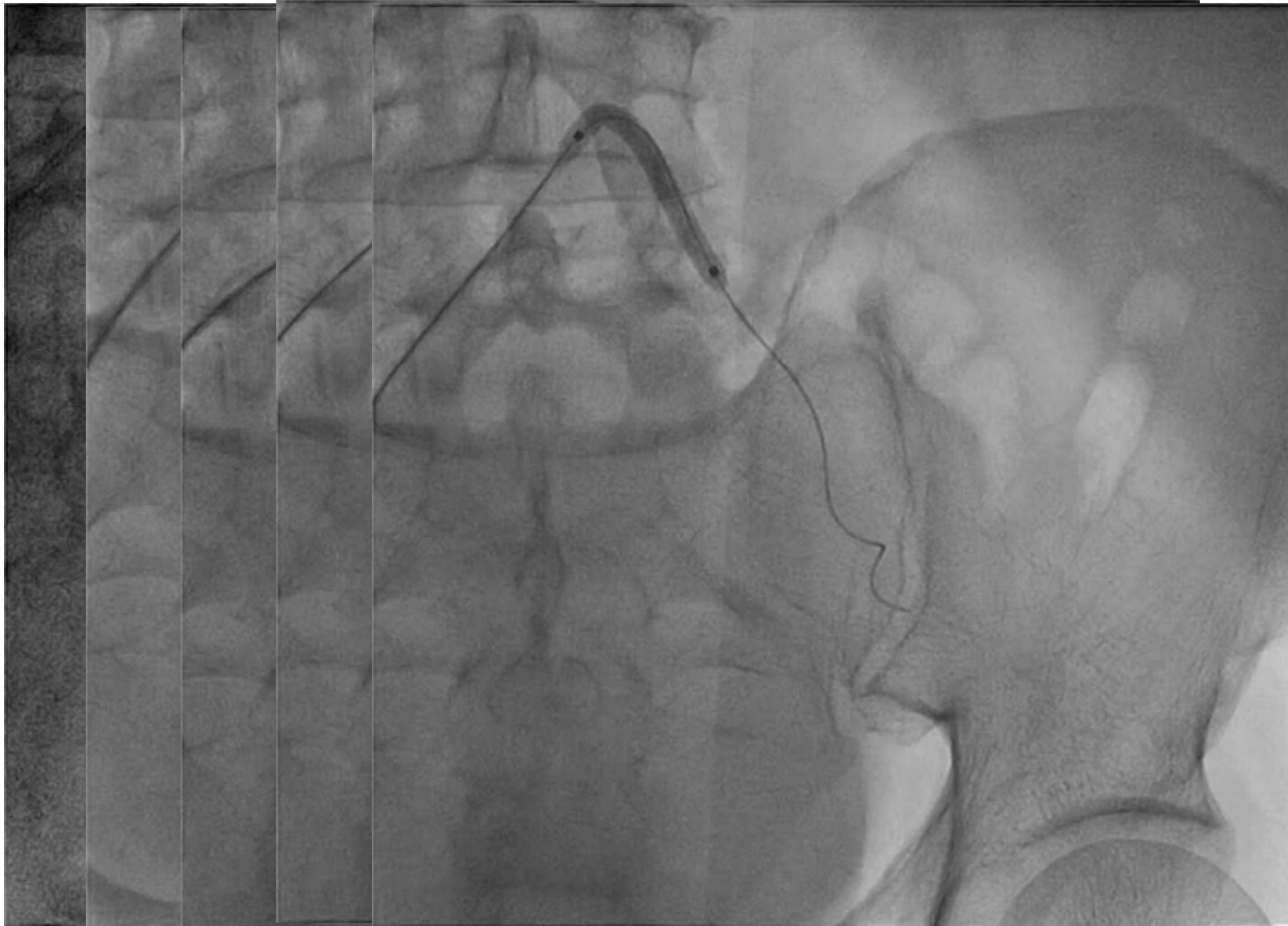
L - Ank.
 SYS 32
 MAP ---
 DIA ---
 PP ---
ABI 0.24



Heart-Brachial 34.1
 Heart-Ankle 146.4
 Brachial-Ankle 112.3 (cm)



Iliac Angioplasty

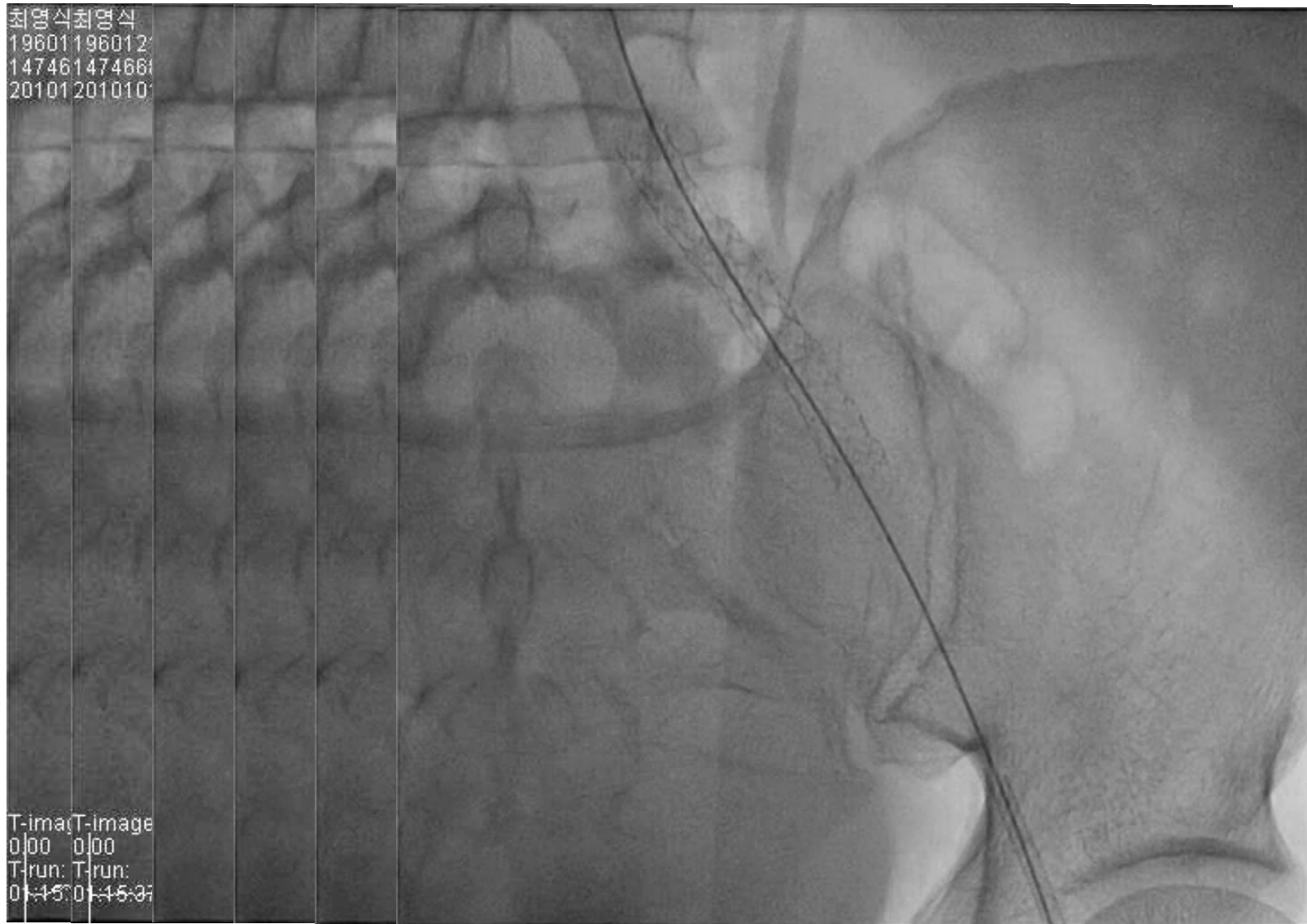


Antegrade with Antegrade with retro balloon support

Retrograde Approach



Balloon & Stent



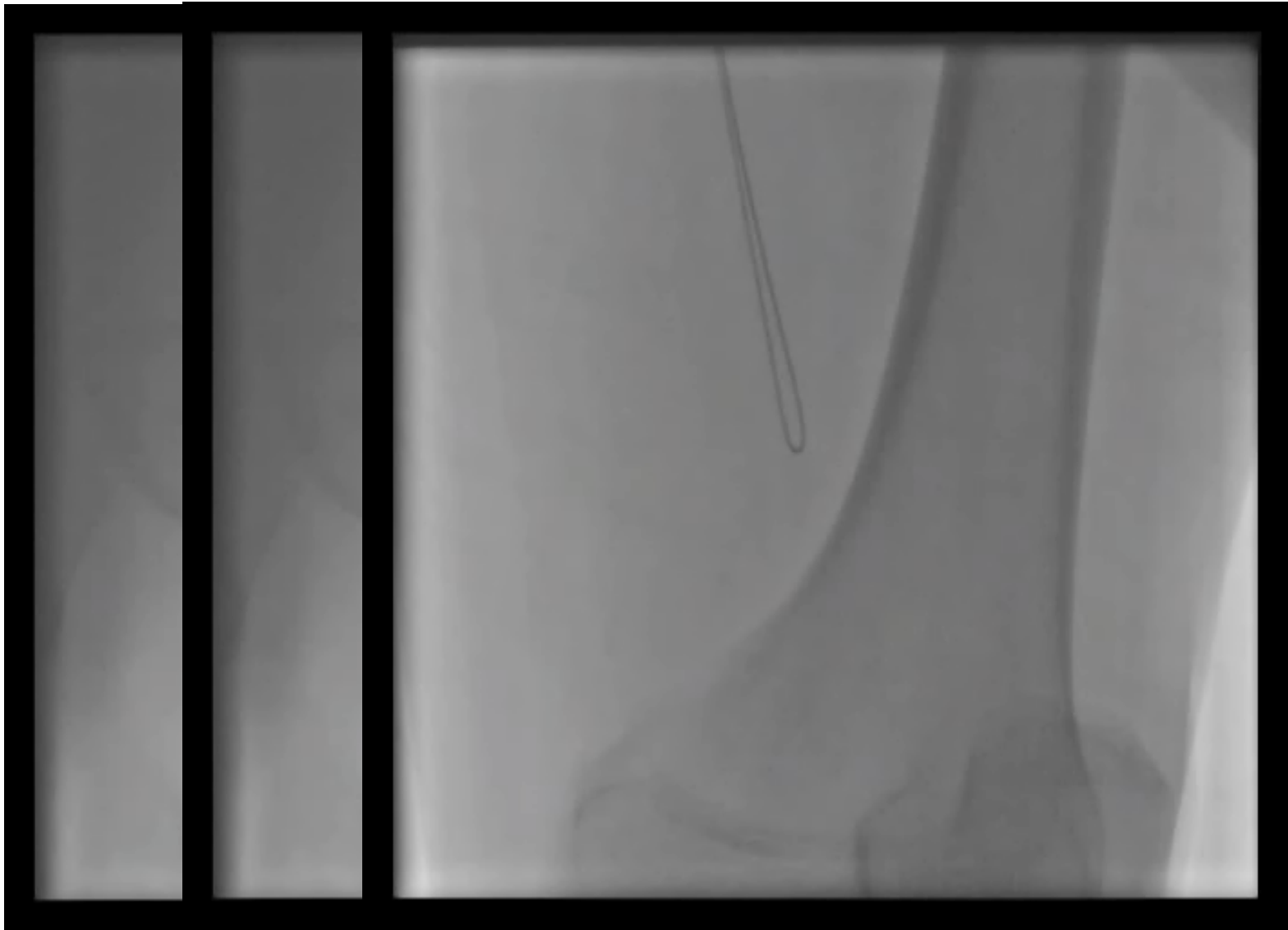
Powerflex 6x40mm Genesis 8x59mm

SFA Attack

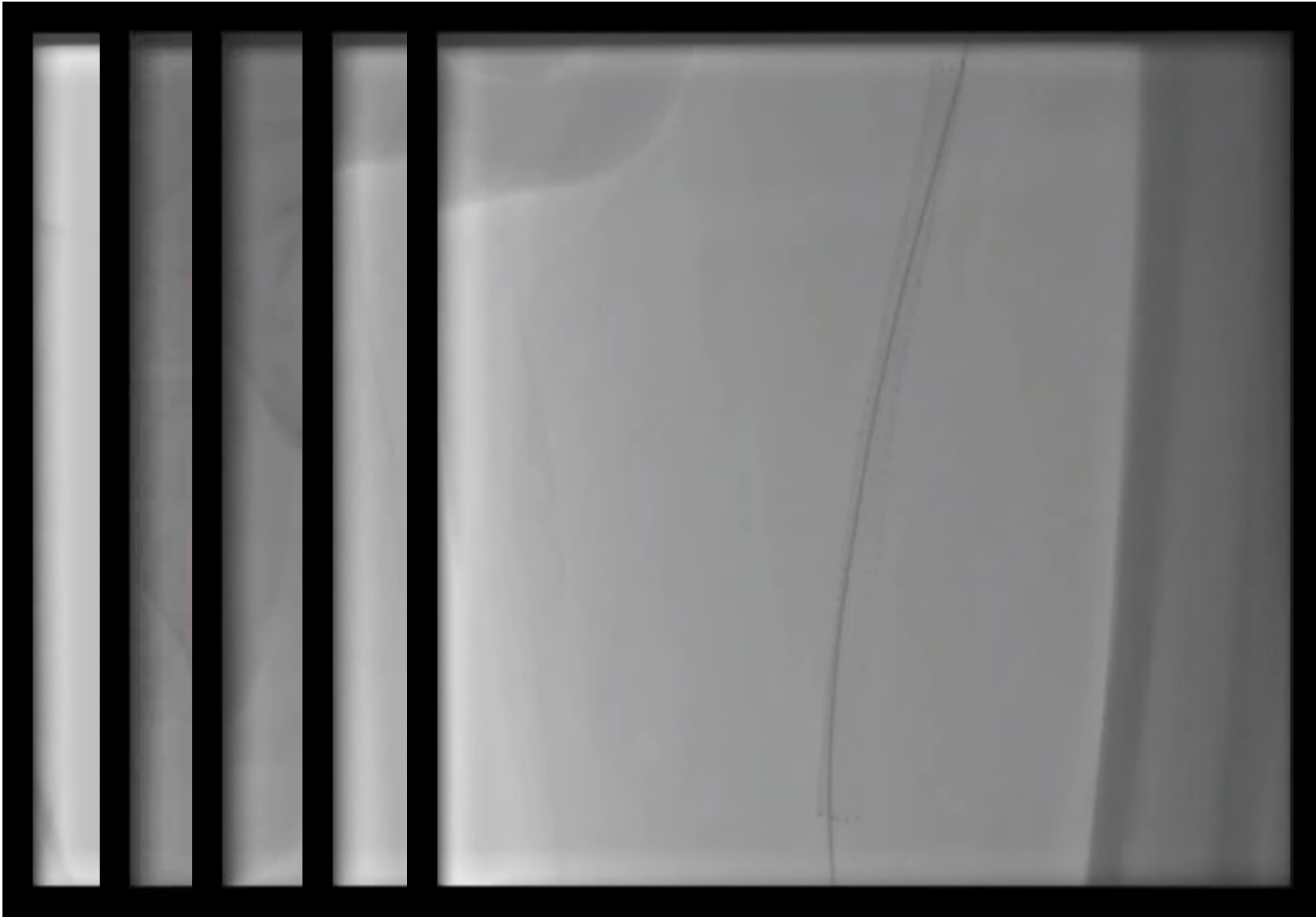


Hemostasis with minimal approach **Rupture?!**

Re-attack 3 months later



SFA CTO for minimal approach



Balloon dilation 5.0*80mm SMART 7.0*100mm

Outflow Management

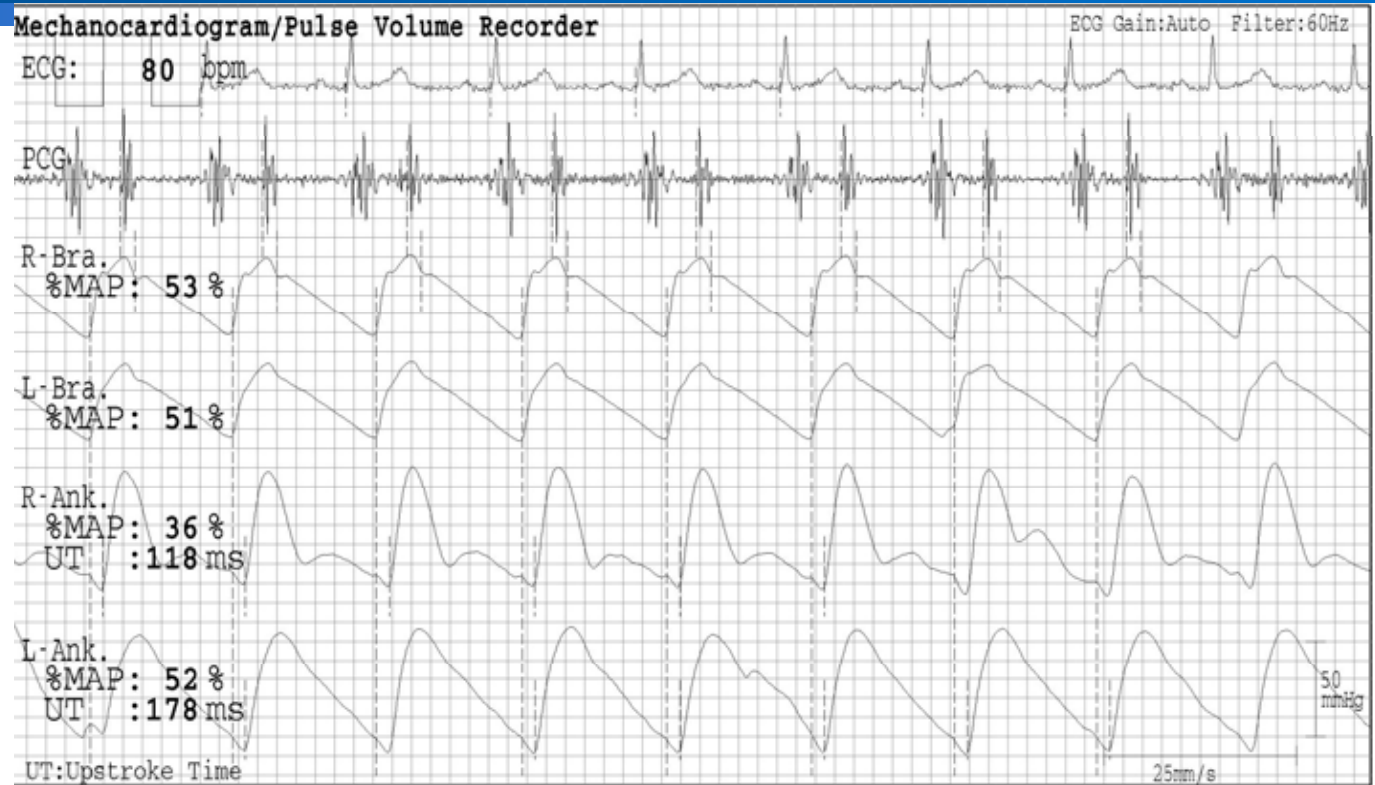
- Treat BTK to ensure good flow
- No RCT outcome data
- Retrograde data/Observational reports

- 1 good BTK vessel is a must
- “The more, the better”



Balloon dilation of ATA & peroneal artery
Final angiogram

Final ABI 1.16/1.11

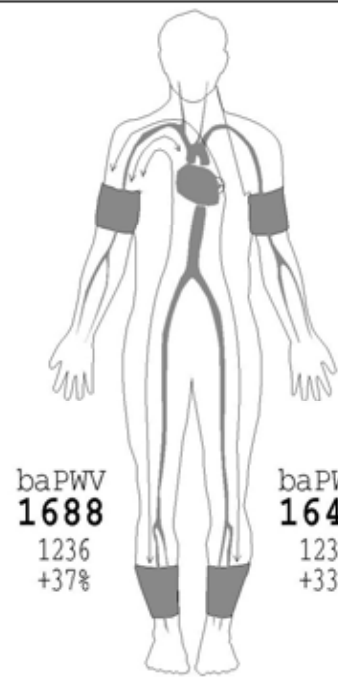


Measurement

(2nd Measured Data)

R-Bra.
SYS 129
MAP 104
DIA 87
PP 42

R-Ank.
SYS 149
MAP 109
DIA 87
PP 62
ABI 1.16



baPWV
1688
1236
+37%

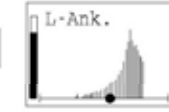
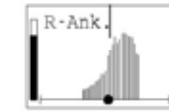
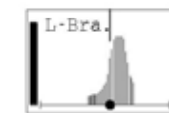
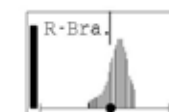
baPWV
1648
1236
+33%

L-Bra.
SYS 126
MAP 102
DIA 87
PP 39

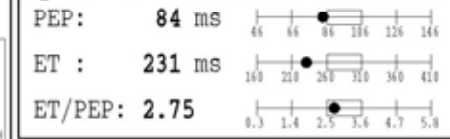
L-Ank.
SYS 143
MAP 97
DIA 79
PP 64
ABI 1.11

Heart-Brachial 33.9
Heart-Ankle 145.7
Brachial-Ankle 111.8 (cm)

BP:mmHg PWV:cm/s



Systolic Time Intervals (R-Bra)



Observation (based on AHA statement)

[Upper extremity]

[Right foot]
Arterial stiffness is suspected.
baPWV is over 1600. And it is over the average level of normal subject with same age.

[Left foot]
Arterial stiffness is suspected.
baPWV is over 1600. And it is over the average level of normal subject with same age.

[Comment]
Guide patients for life style modifications and regular check-ups.

Summary

- Complex/complicated Lesions
 - Difficult (but not impossible)
 - Risk of complication
 - Incomplete results
 - Require more time, devices, skills & effort
- *Find a good vascular surgeon!*

A good plan is always better than best rescue!