Complex Case for Critical Limb Ischemia

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Case 1

79/M

C/C Lt.3rd toe necrosis & ant.tibial ulcer (O:1 weak ago)
Claudication (O:1 year ago)

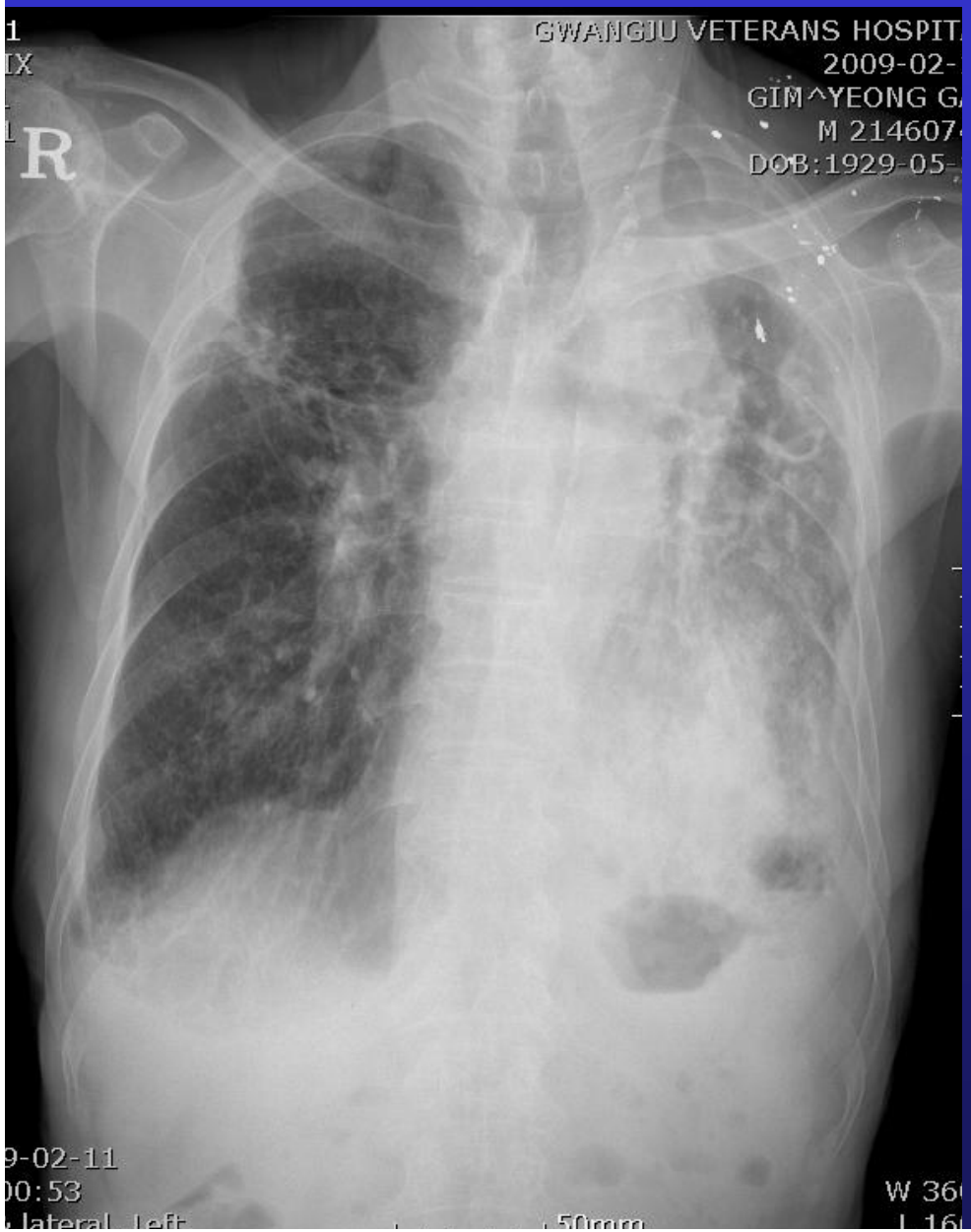
Symptoms developed one year ago, and the patient's clinical status has deteriorated over the past week

P/H DM, hepatitis, HTN (-)
Tb (+) (20 Y ago)
local clinic : sputum study
→ AFB stain 4+
TB-PCR : MTB + / NTM –

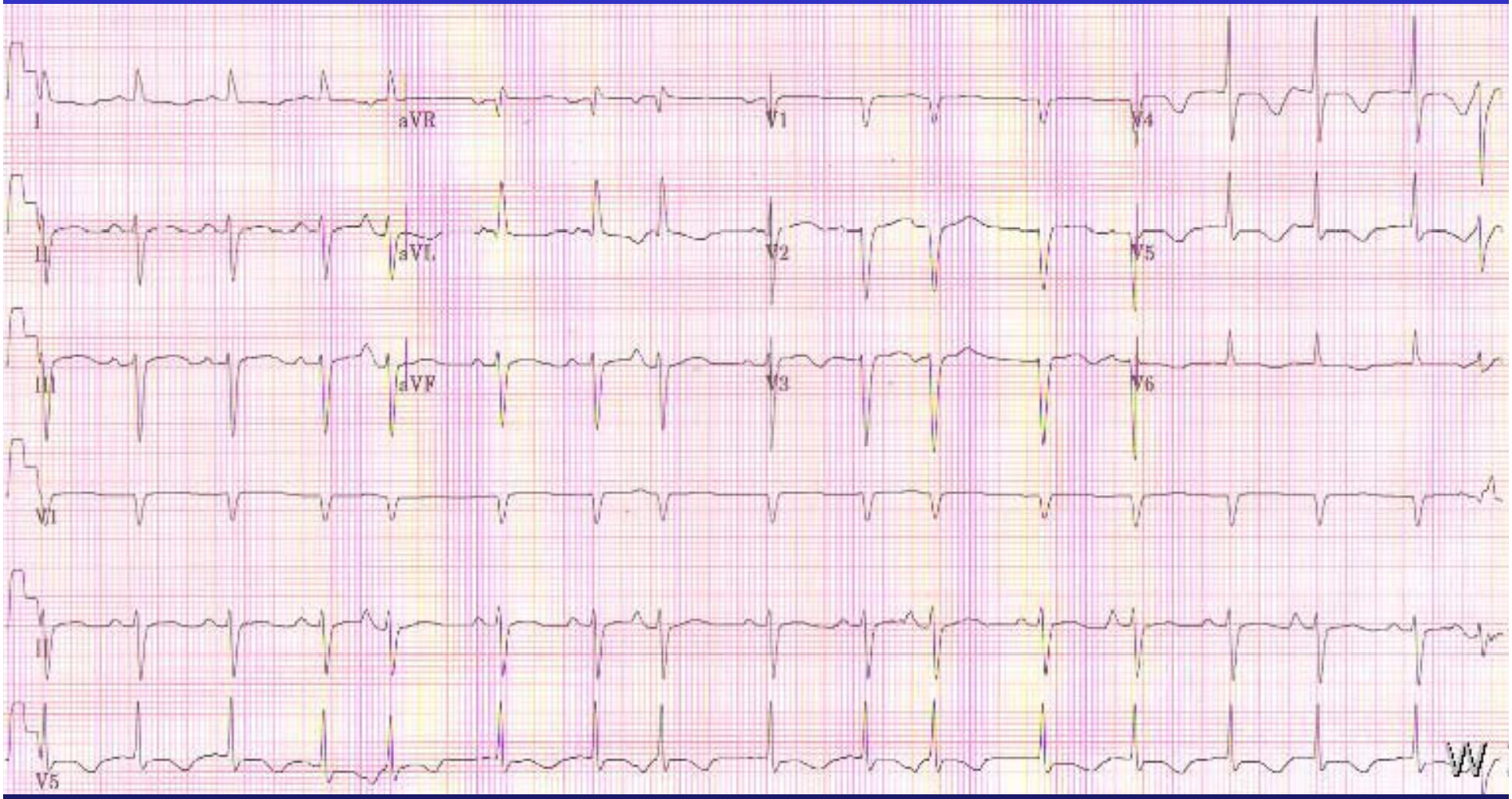
S/H Smoking : 20 pys
Alcohol : none

V/S BP : 110/70 mmHg HR : 70회/min

Chest X-ray on admission



EKG on admission



- Cardiac echocardiography

  -- left ventricular ejection fraction of 35% with global hypokinesia.
- coronary angiography

  -- revealed insignificant stenosis.

CTA lower extremity (HD #1)

ABI 0.97/0

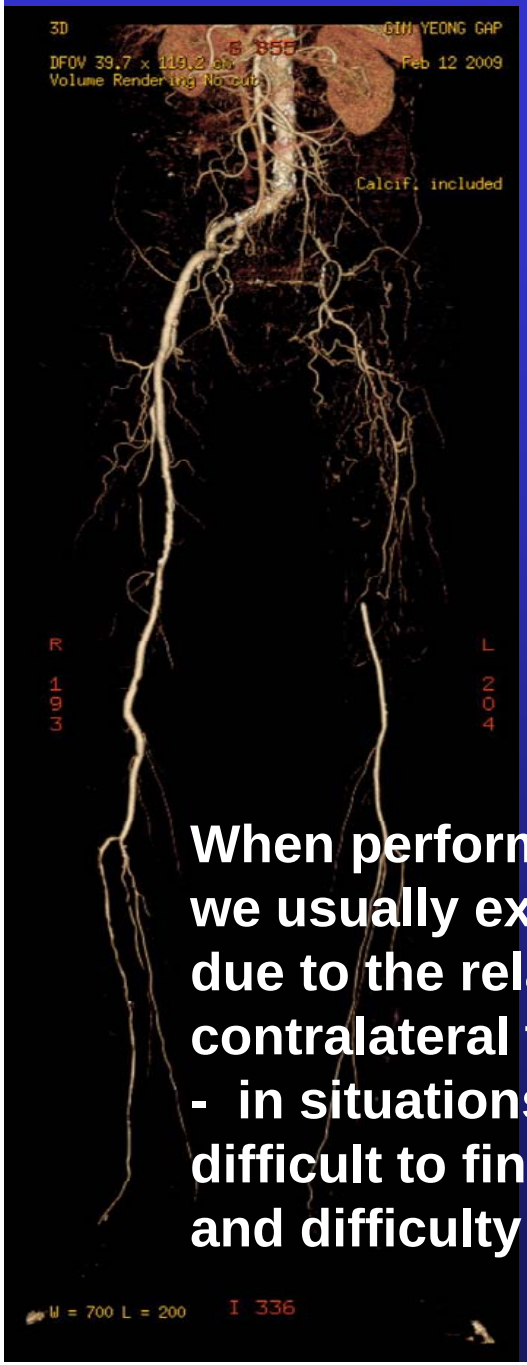
How to treat for this patient?

1) Bypass Operation

2) PTA/stent

3) Medical treatment only

Because of the high risk of general anesthesia and patient refusal to undergo surgical revascularization, endovascular treatment was planned for the extensive iliofemoral occlusive disease.



What's the appropriate approach method for this patients?

1) Brachial approach
2) Contralateral femoral approach
3) Popliteal retrograde appraoch
4) Dual approach

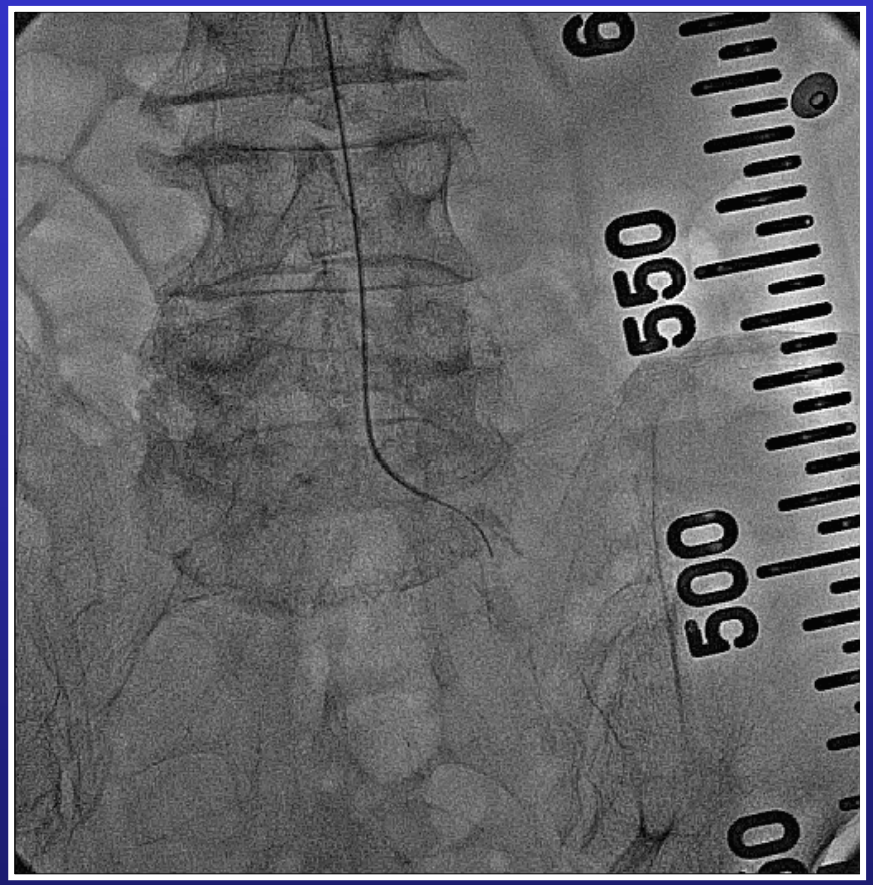
When performing a PTA for CIA CTO lesions involving the ostium, we usually experience difficulty in passage or handling of the wire due to the relatively weak guiding catheter backup support with the contralateral femoral approach.

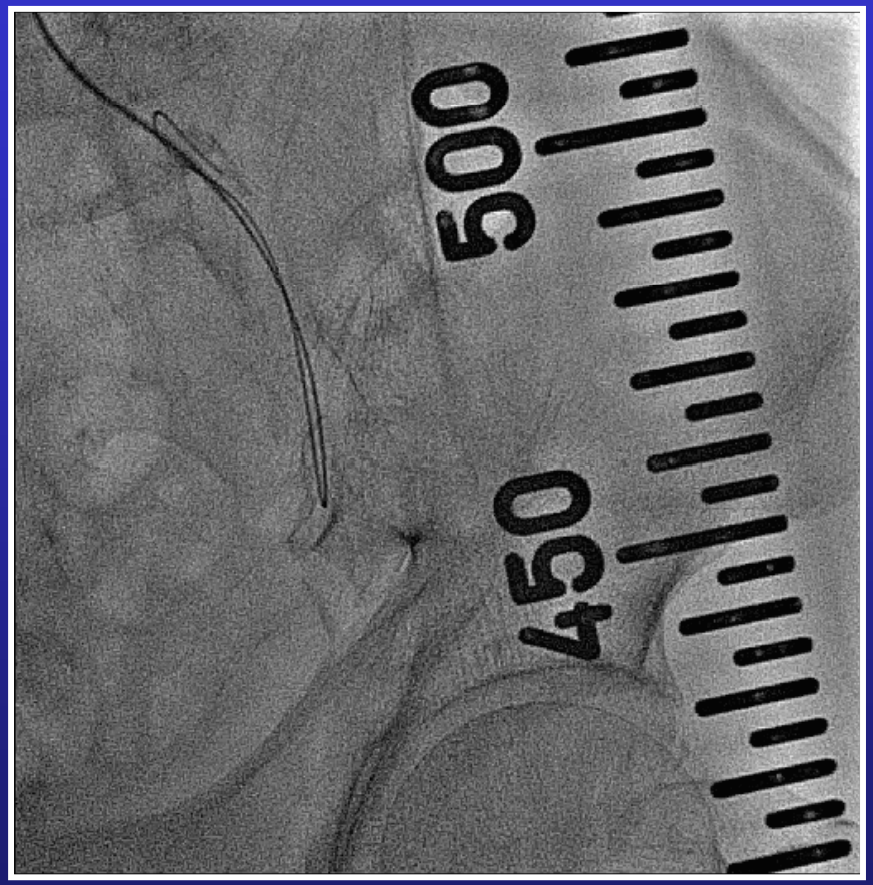
- in situations involving a very long ilio-femoral artery, it is very difficult to finalize the procedure because of a short balloon length and difficulty with wire manipulation.

Lower Ext angiogram

total occlusion of left CIA and left CFA with collateral flow that reconstructed the distal SFA

Subintimal Wiring



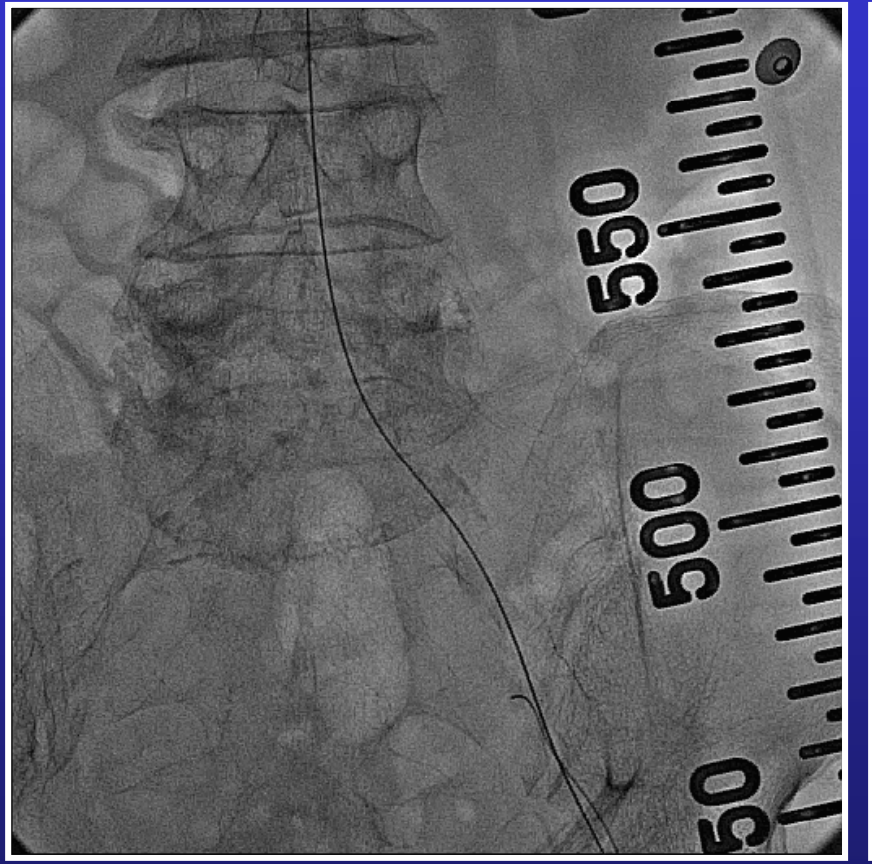


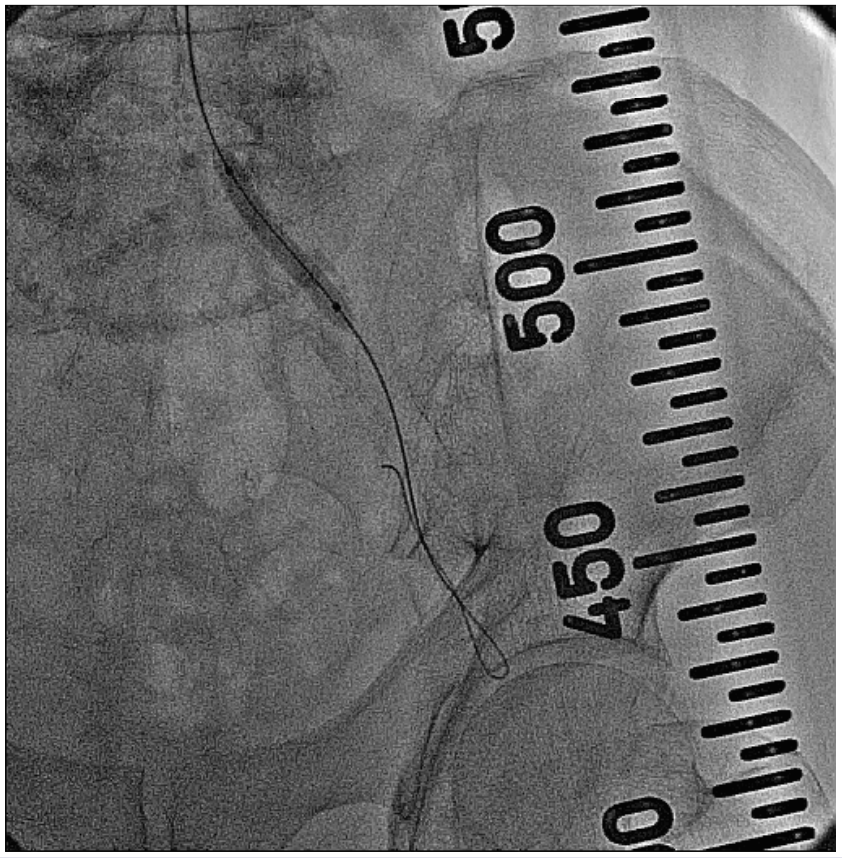
Sheath: 6F shuttle sheath

Backup catheter: 4F multipurpose catheter

0.035 angled Terumo wire

Subintimal Wiring for Iliac Occlusion

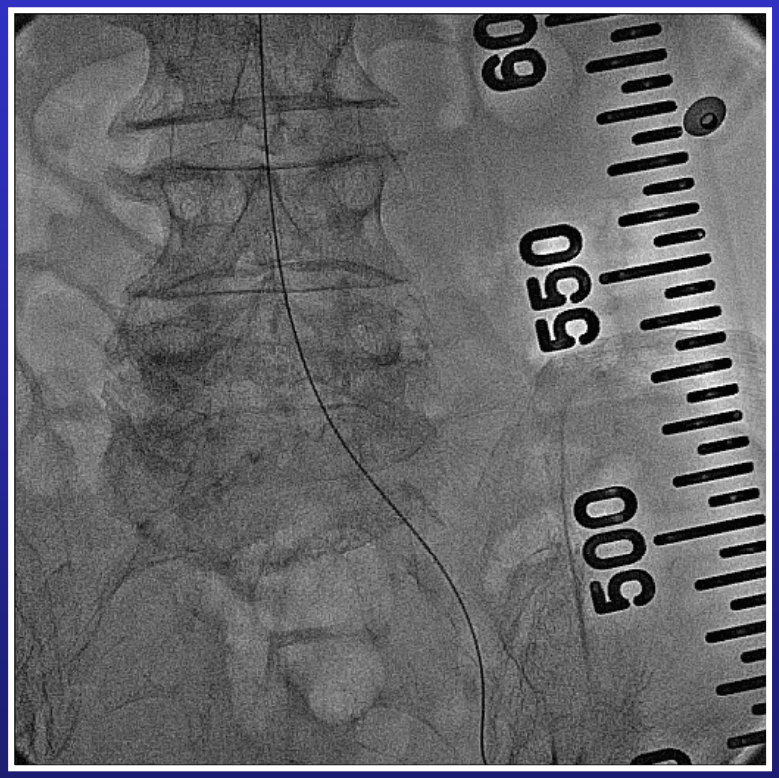




Subintimal wiring by transbrachial Appraoch : from CIA to SFA

6*40mm Powerflex by Cordis

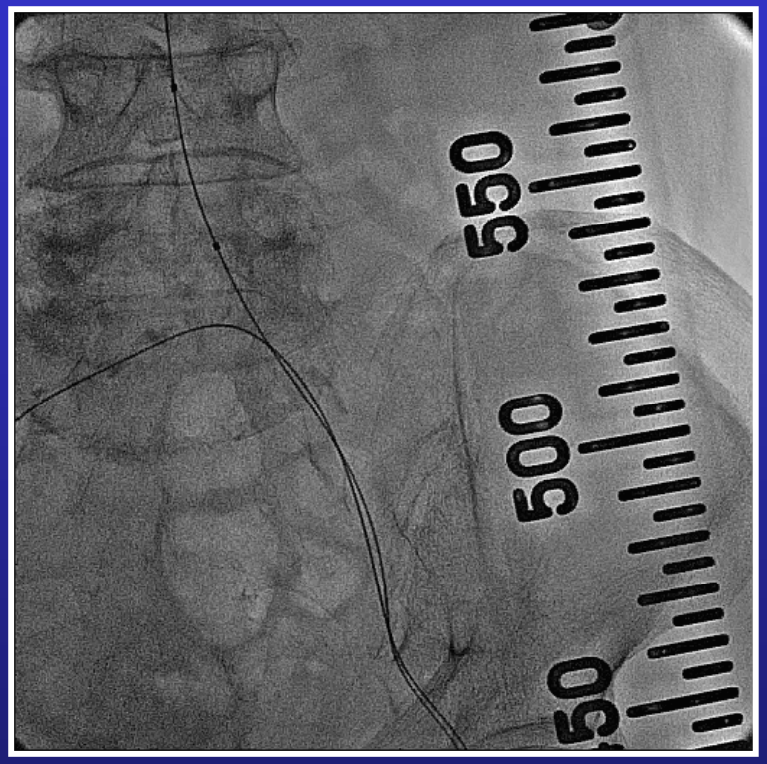
Subintimal Wiring and PTA

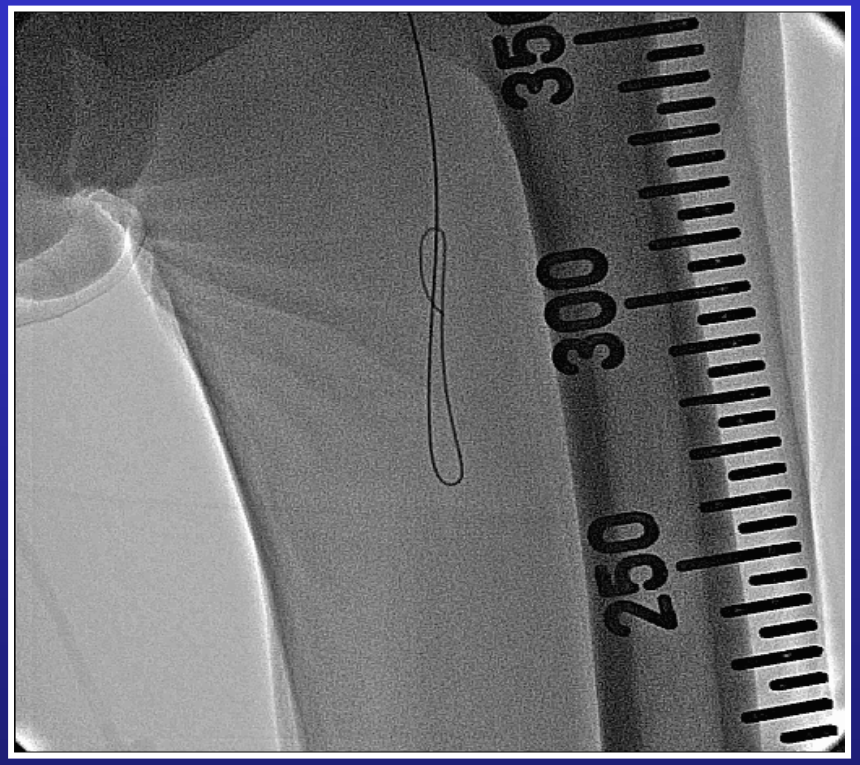


After PTA : subintimal dye stain

Prepare subintimal wiring
by transfemoral appraoch

Subintimal Wiring for SFA occlusion



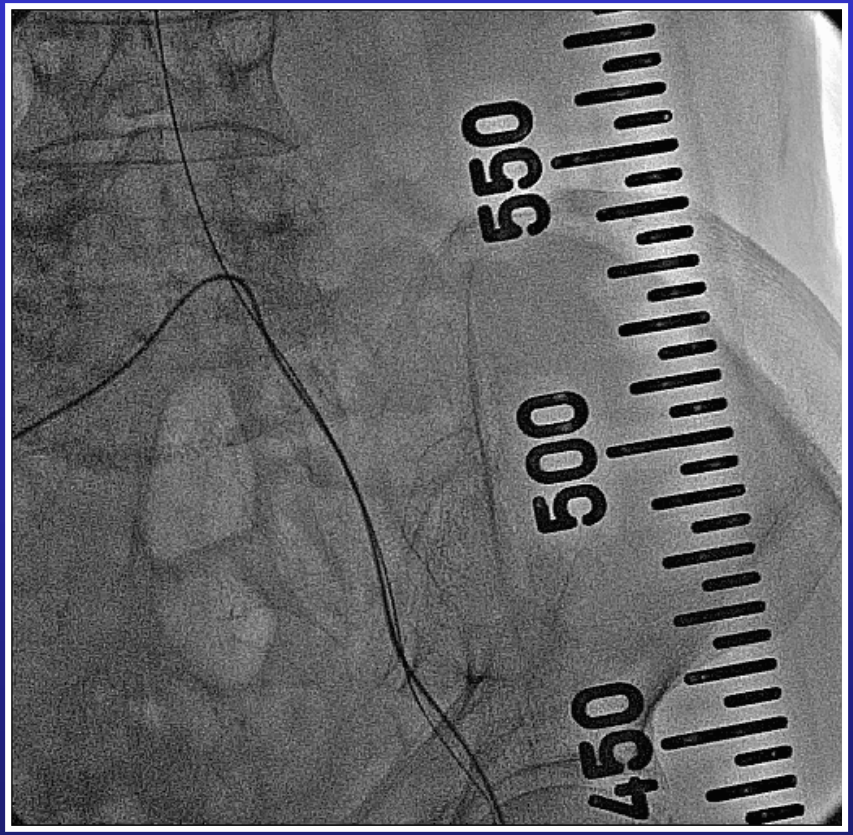


Subintimal wiring by contralteral transfemoral appraoch

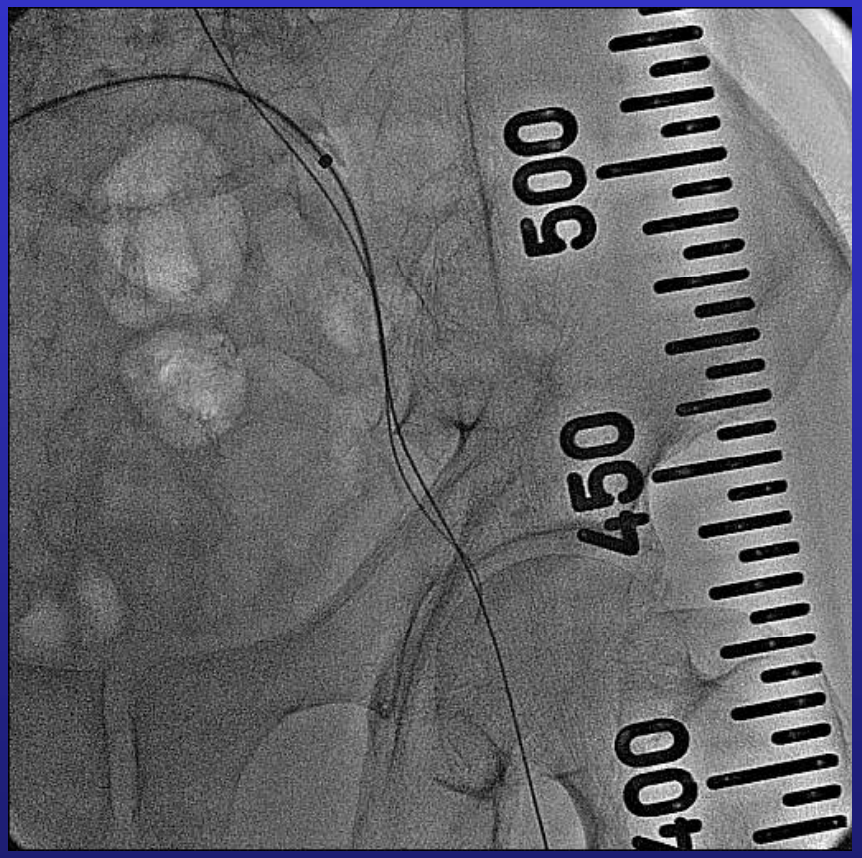
Backup catheter: 4F multipurpose catheter

Wife: 0.035 angled Terumo wire

Subintimal Wiring for SFA occlusion

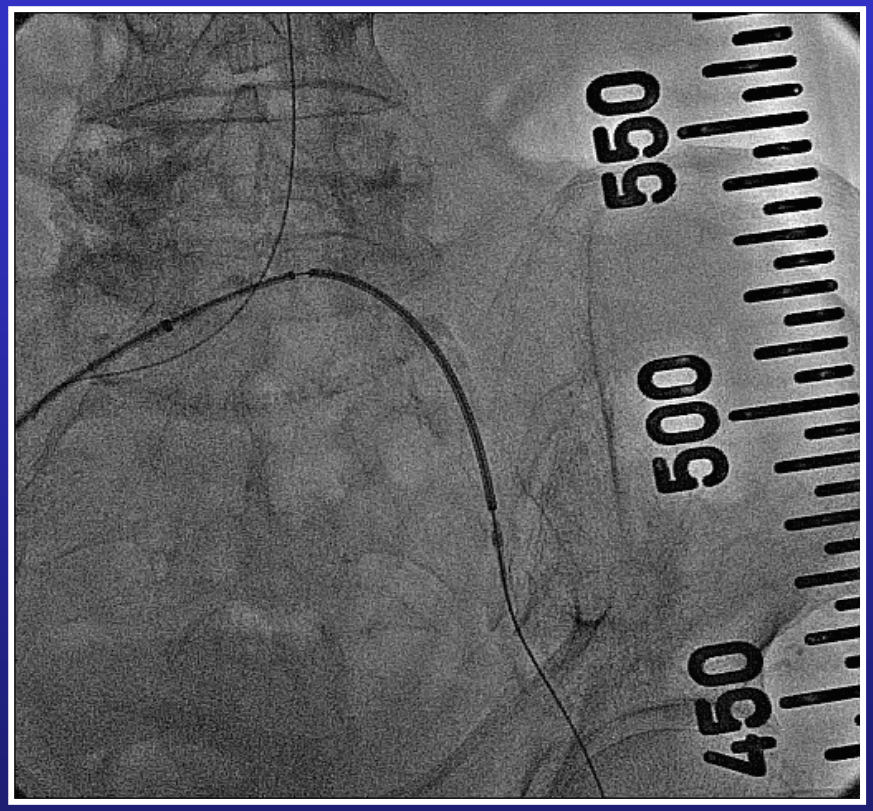


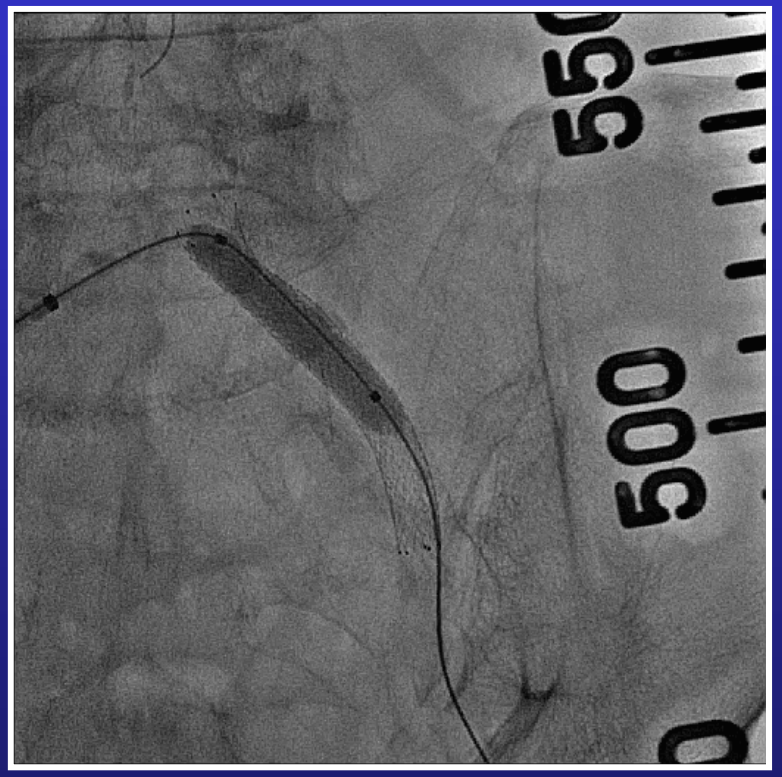
Successful subintimal wiring by transfemoral appraoch



Backup: 6F Balkin sheath

PTA for SFA and Stent for Iliac Artery

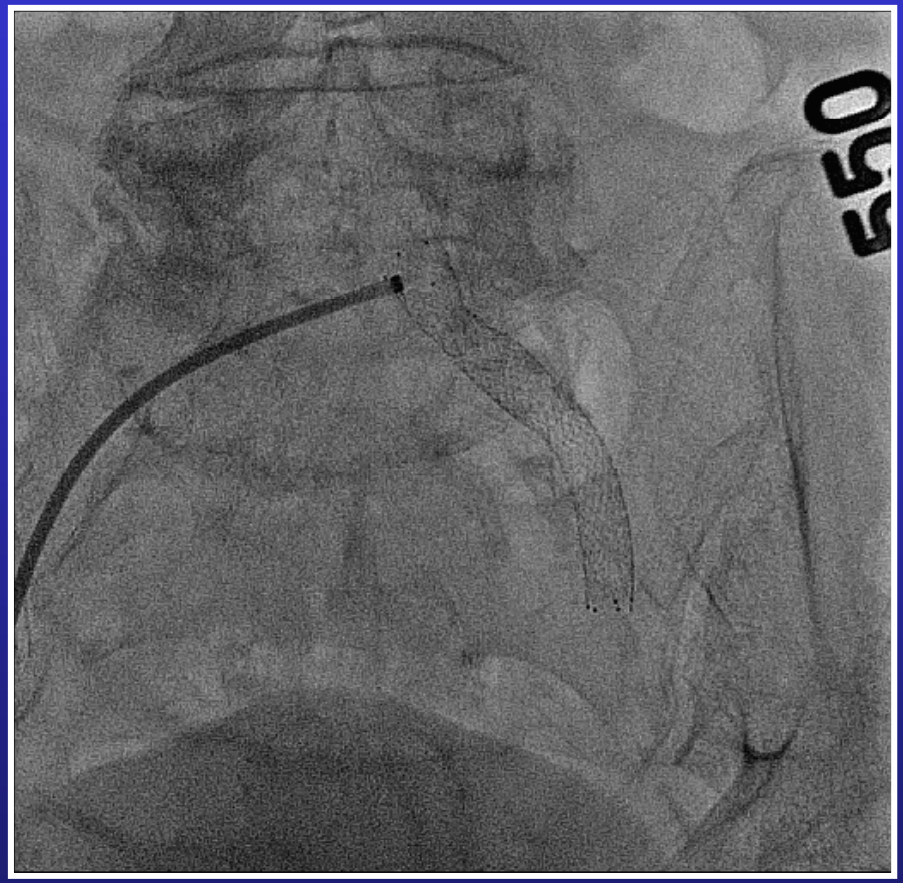




10*60mm SMART Stent for CIA and EIA

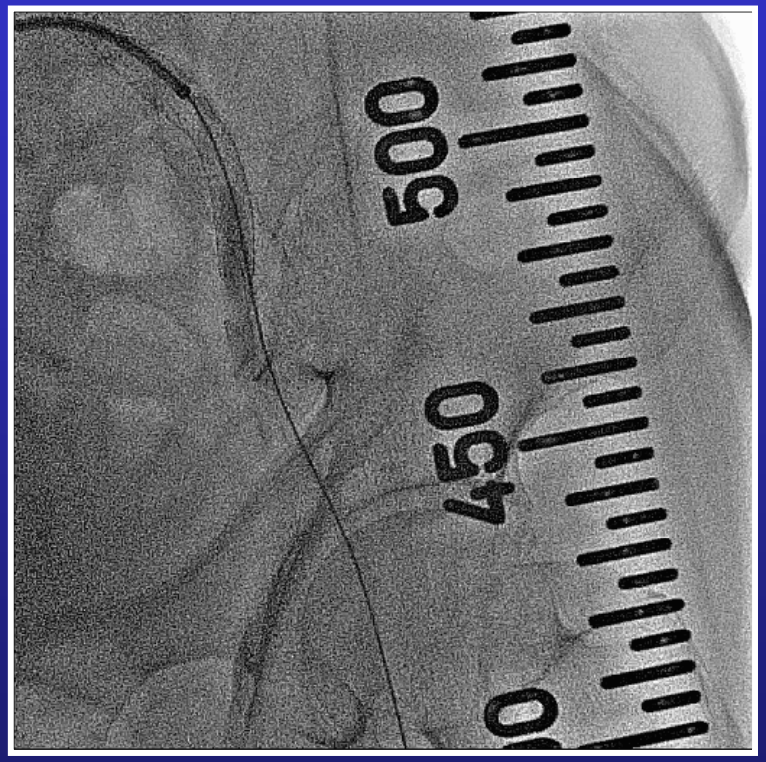
8*40mm Powerflex balloon at 10 atm

Stent for Iliac Artery



PTA for SFA

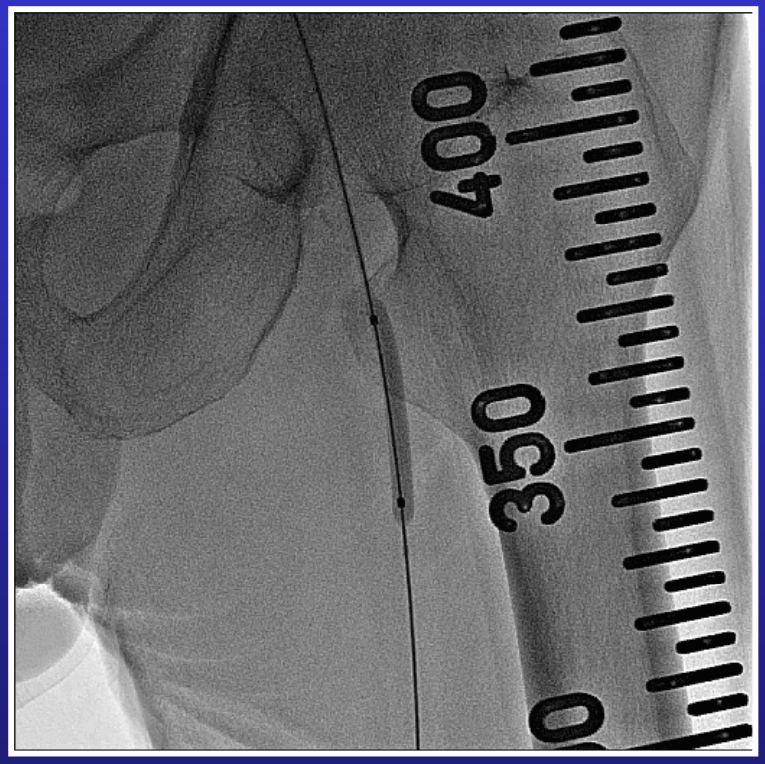
4*40mm Powerflex by Cordis



Angiogram after PTA

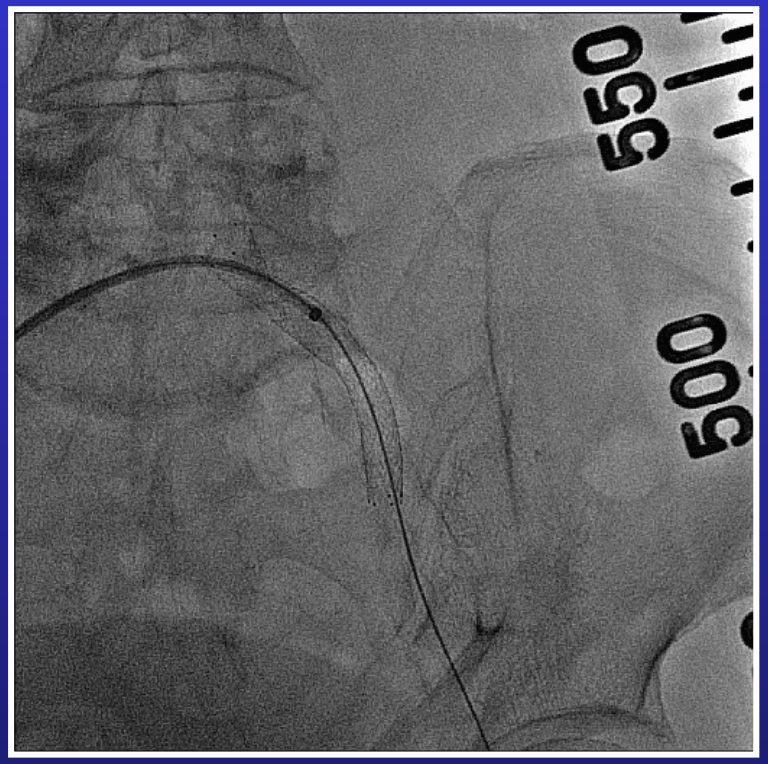
Remained stenosis in p-SFA

PTA for SFA



Additional ballooning for p-SFA

5*80, 6*40 bal

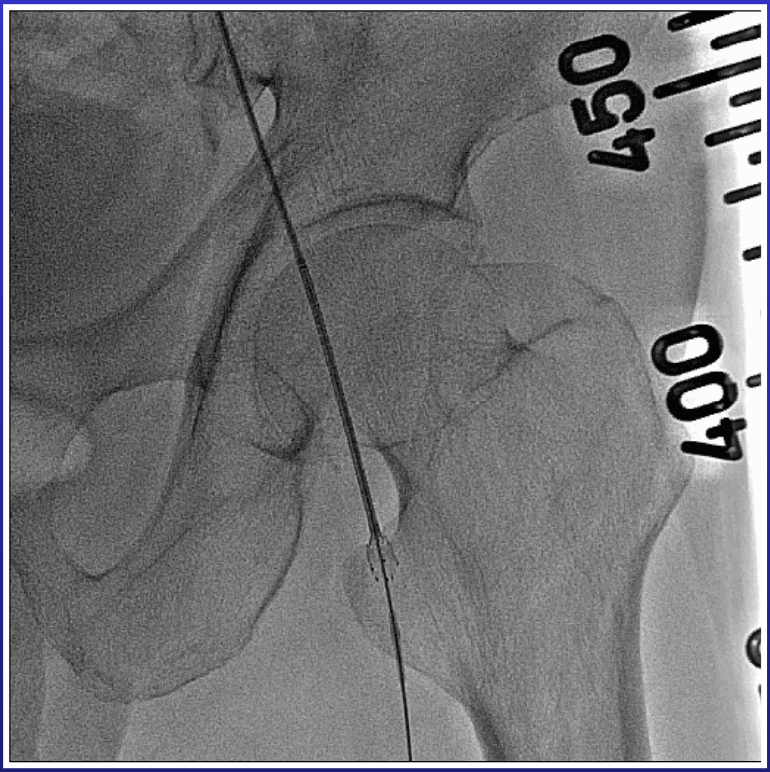


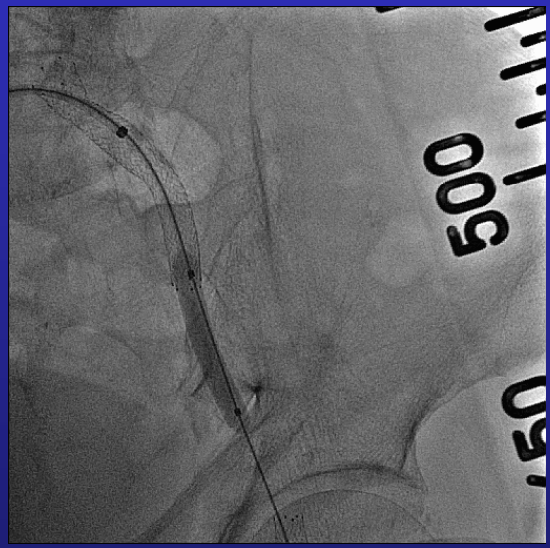
Angiogram after PTA

Remained stenosis in p-SFA

Pressure gradient at p-SFA

Stent for SFA Lesion

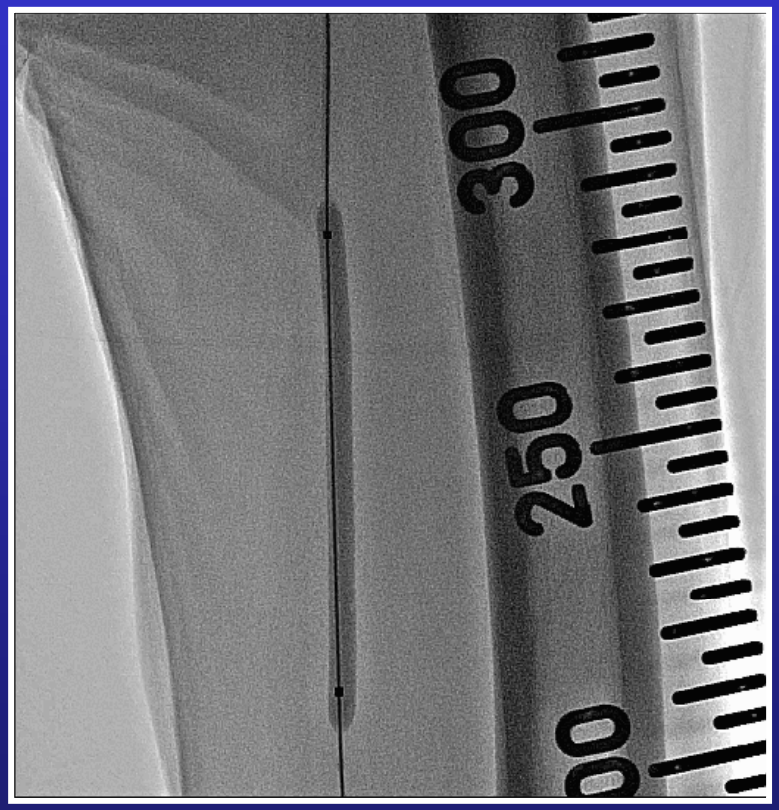




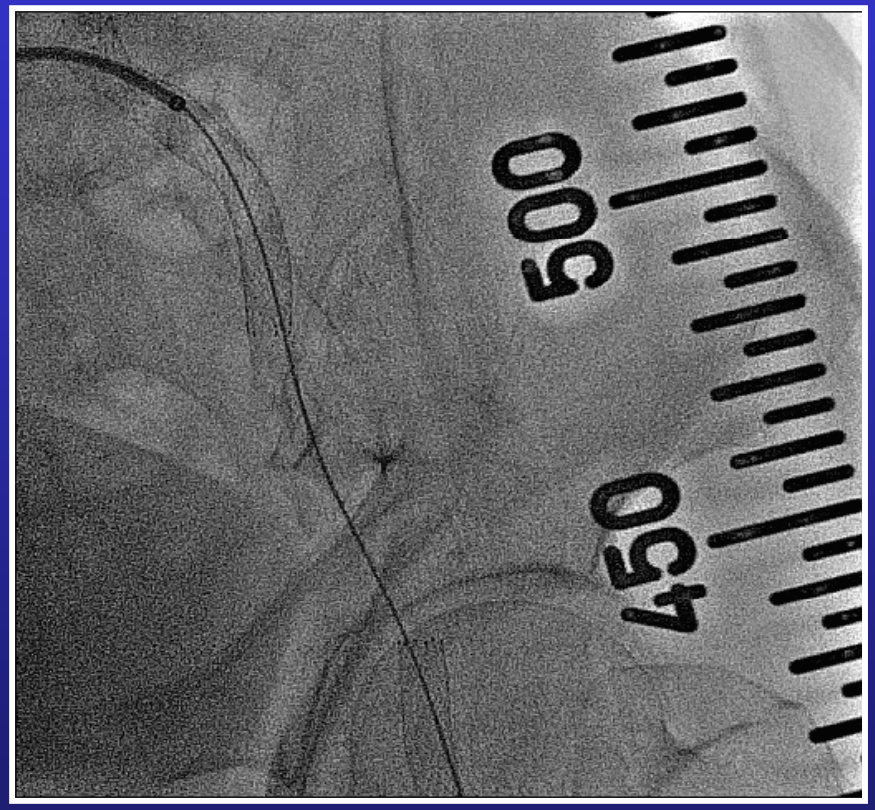
7*40mm SMART Stent for SFA

Additional balloon using 6*40 bal

Final Angiogram



PTA for SFA 5*80mm bal



Final angiogram

Pressure gradient between CIA and popliteal artery

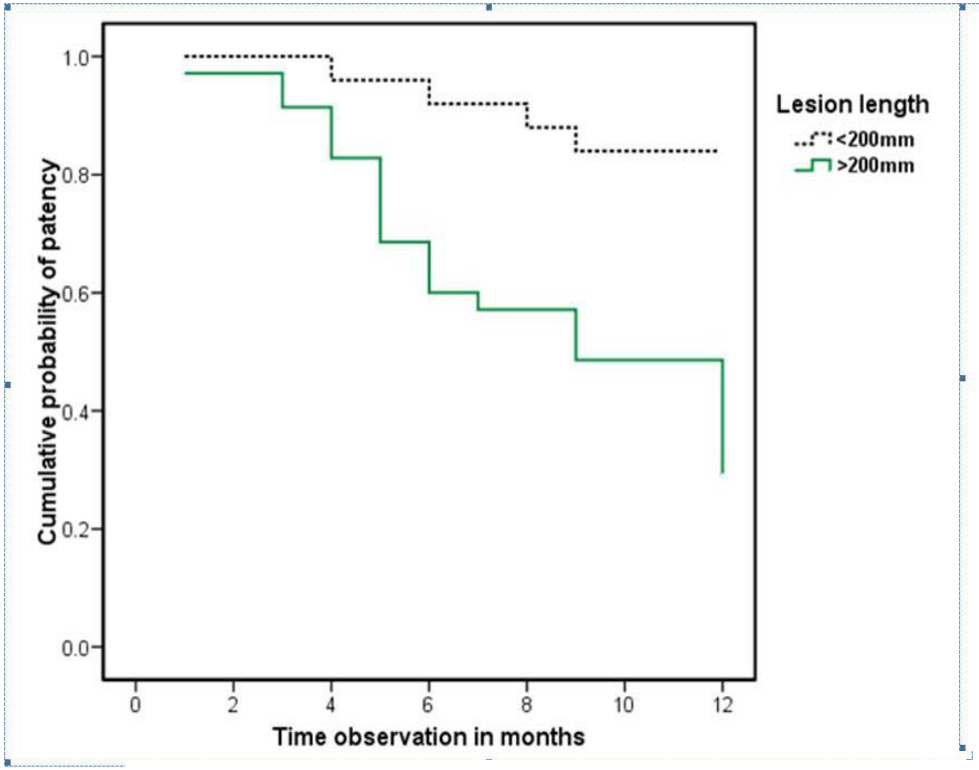
CTA lower extremity (HD #7)

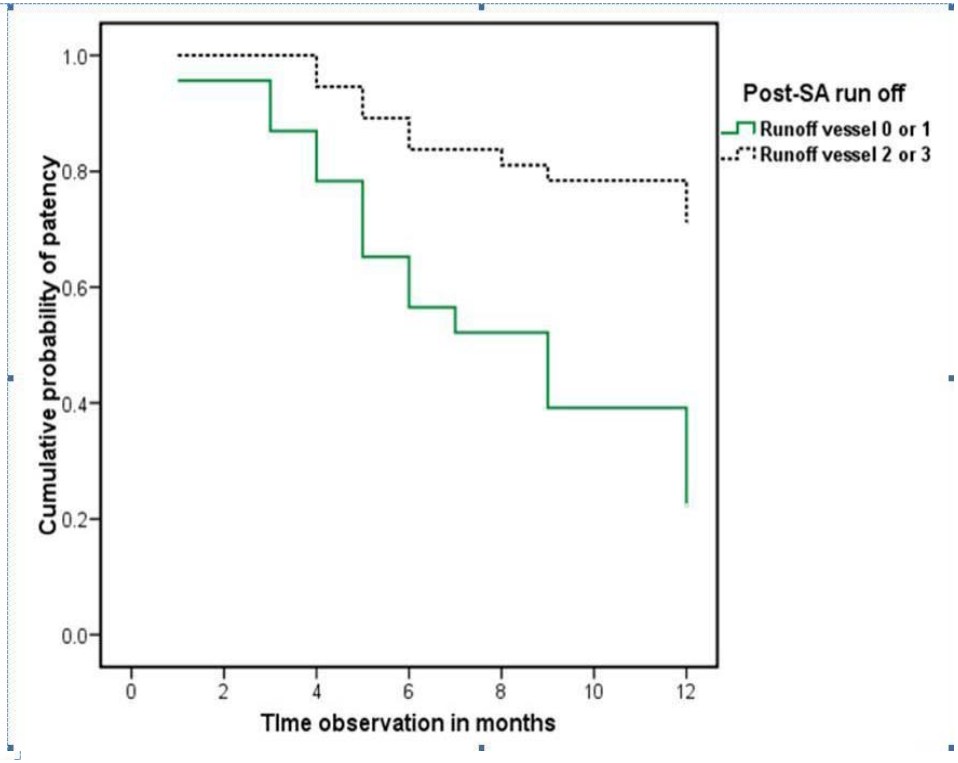
ABI 1.13/0.96

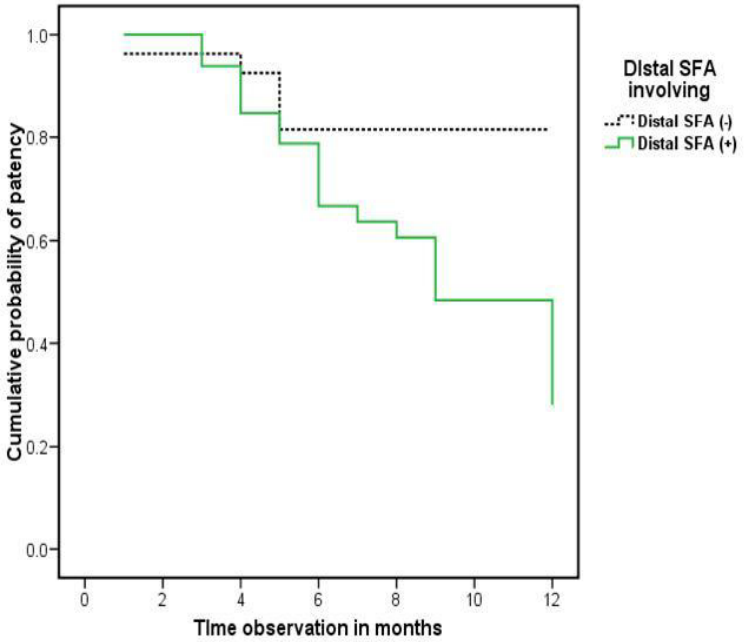
Determinants of Procedural Success and Patency following Subintimal Angioplasty in Patients with TASC C and D Femoropopliteal Arterial Disease

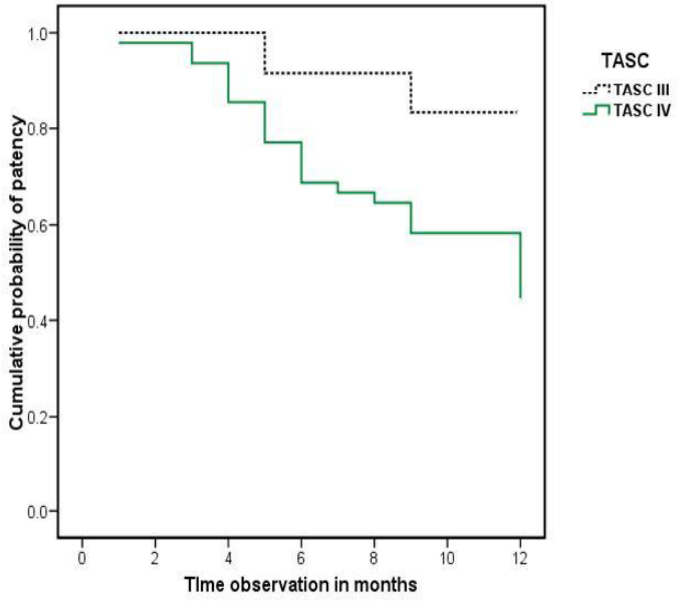
- **63 lesions in 54 consecutive patients suffering from limb ischemia (Fontaine IIB –IV).**
- **inclusion of peripheral artery disease**
  - **TASC C and D with occlusion above 10 cm**
  - **Exclude : Acute occlusion, short occlusion (<10cm),**
- **TASC C (n=13, 20.6%) or TASC D (n=50, 79.4%).**
- **Success rate: 59 of 63 lesions (93.6%)**
- **Primary patency rate at 12 months was 51.6%.**

Kim SJ, Kim W, Kang WY, et al. Circ J 2010


Cumulative probability of patency
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
Time observation in months
Lesion length
<200mm
>200mm


Cumulative probability of patency
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
TIme observation in months
Post-SA run off
Runoff vessel 0 or 1
Runoff vessel 2 or 3


Cumulative probability of patency
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
TIme observation in months
DIstal SFA involving
Distal SFA (-)
Distal SFA (+)

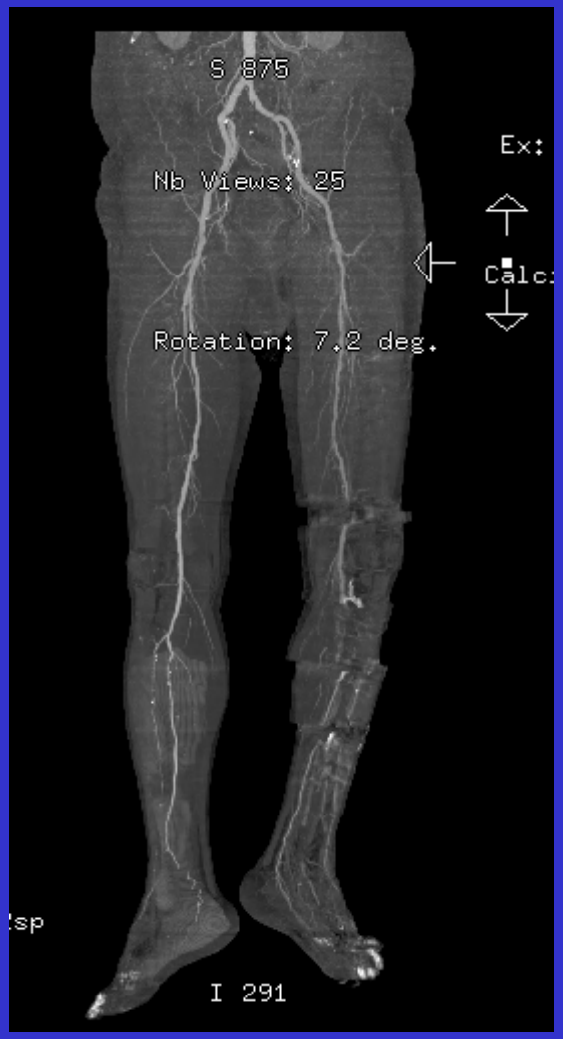

Cumulative probability of patency
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
TIme observation in months
TASC
TASC III
TASC IV

PTA for left posterior tibial artery using cross-pedal approach

Case Presentation

- 62 year-old male patient
- Toe pain with necrosis (left 4^{th} and 5^{th} toe) for 1 month
- Past history
  - Hypertension, DM, Old CVA, CKD on HD
- Ankle brachial index
  - Right : 1.01
  - Left : 0.77

LE CTA and left foot



Diagnostic angiogram

- 6-Fr introducer sheath was inserted through Lt. femoral artery, antegrade
- Angiogram was performed using JR4 and 4-Fr MP catheter

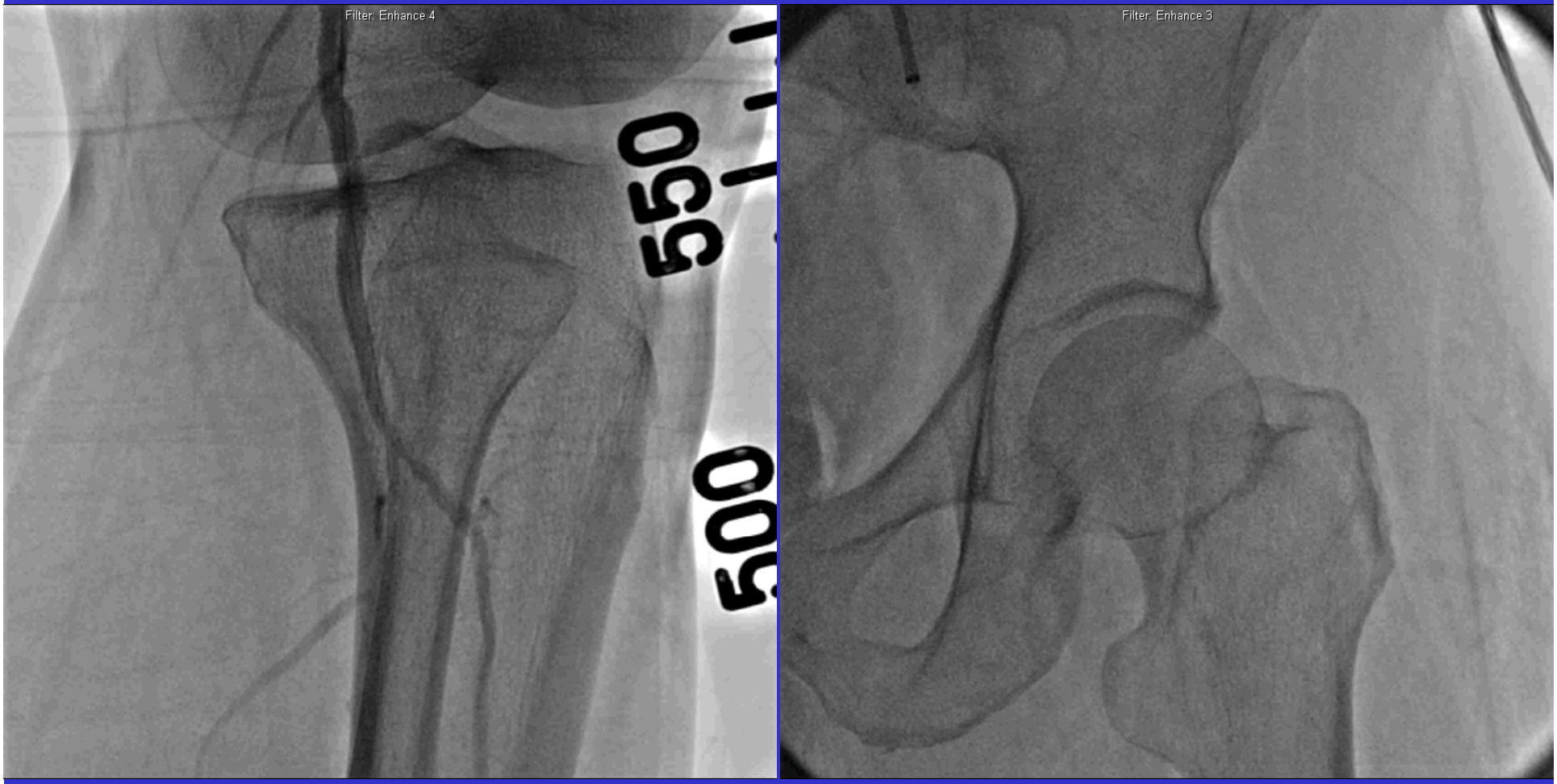
Cross-pedal approach

- Wire was advanced : ATA → PTA → POP
- Wire extraction using snare

BTK ballooning

- PTA was done
- 2.5x150mm Sleek balloon → PTA and peroneal artery

Final angiogram



Final Results

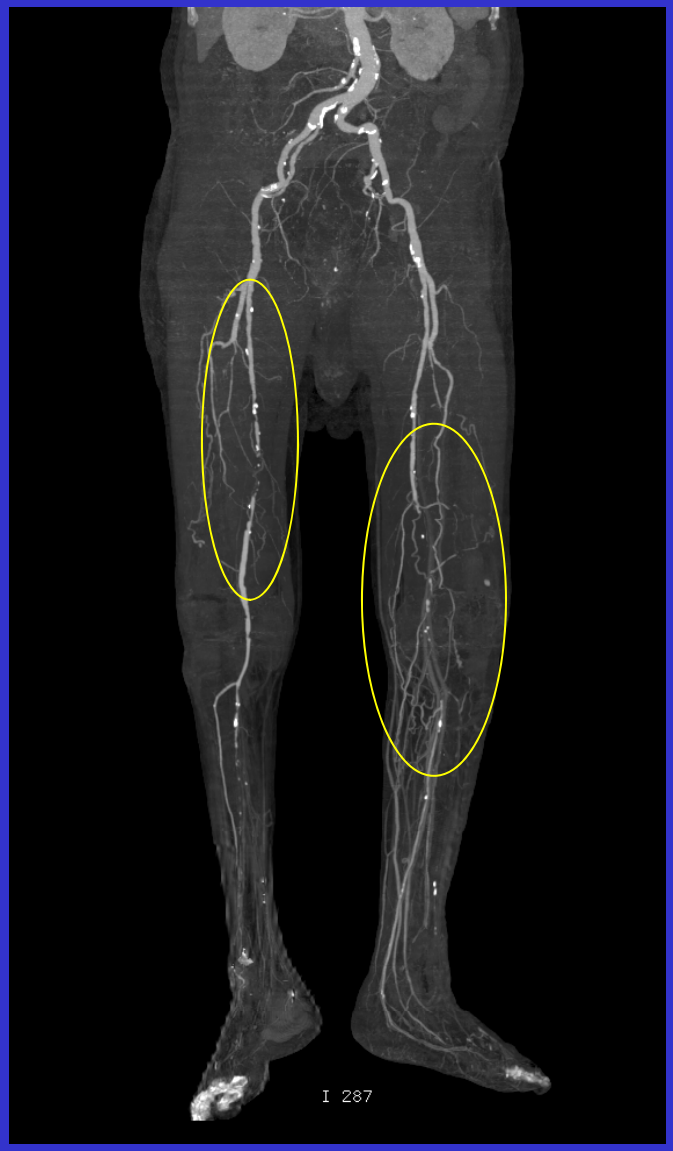
ABI of Left leg : 0.78 → 1.06

PTA using Trans-pedal approach in case of distal SFA to distal run-off vessels

Case Presentation

- 80 year-old male patient
- Open wound with pus discharge
  - lateral malleolus area of left foot
- Past history
  - Hypertension, COPD
- Ankle brachial index
  - Right : 0.61
  - Left : 0.65

LE CTA



- Significant arterial stenosis and near total occlusions of both SFA

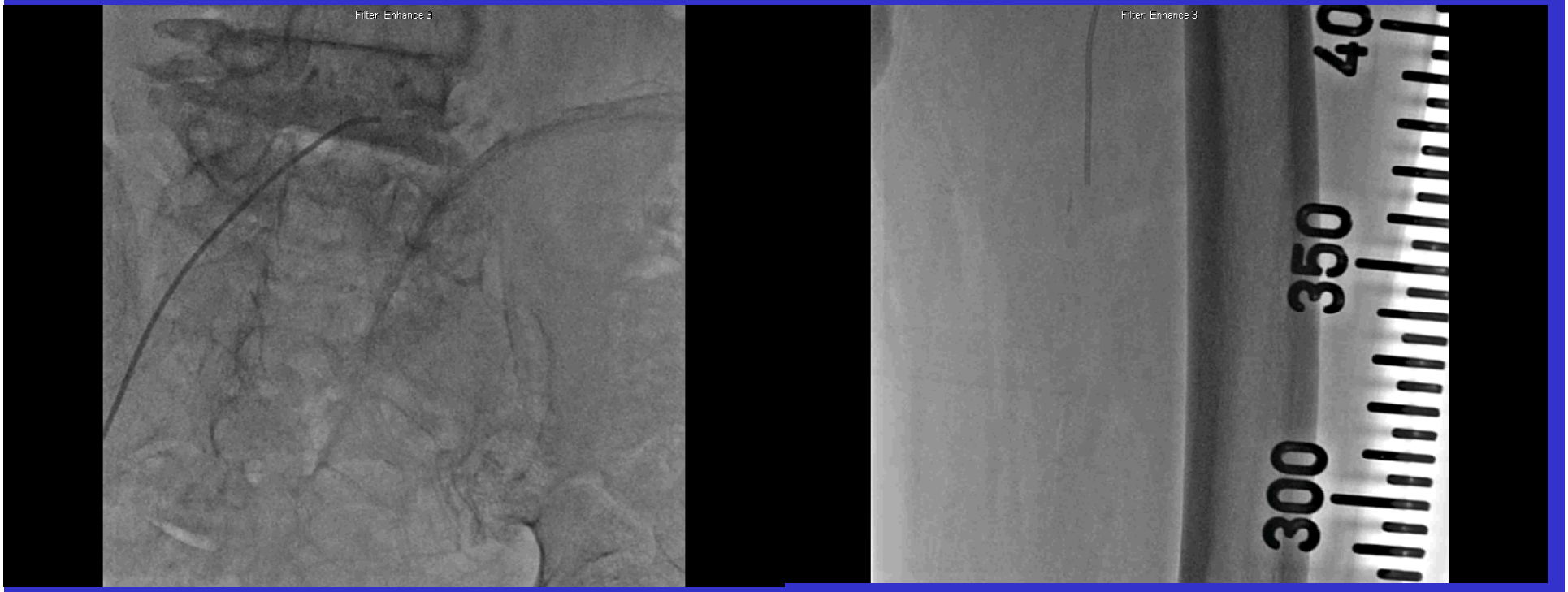
- Diffuse atherosclerosis in right popliteal artery with irregular arterial stenosis

- Total occlusion of left popliteal artery

Endovascular strategy

- Right femoral and left transpedal approach
- Angioplasty for left SFA and popliteal artery
  - Stenting, if needed

Diagnostic angiogram

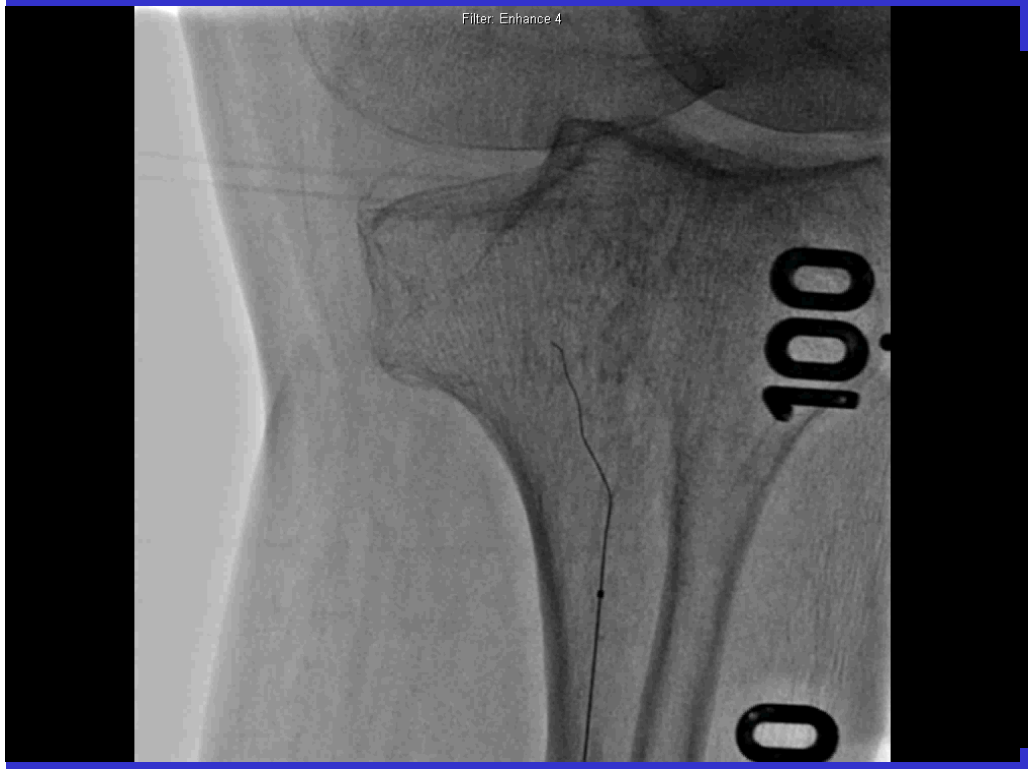


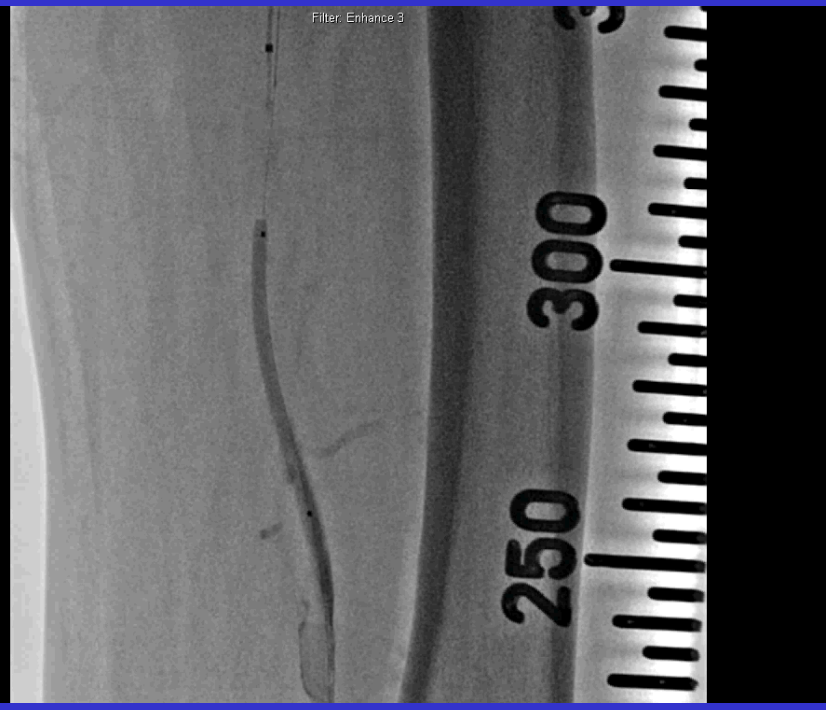
- 5-Fr introducer sheath was inserted through right femoral artery
- Angiogram was performed using JR4 and 4-Fr MP catheter
- Peripheral angiogram showed total occlusion of distal LSFA to popliteal artery

Retrograde approach

- Lt. Pedal artery was punctured by 20 gauge needle
- After wire (Fielder FC 300cm) passage, we advanced 3x60mm Savvy balloon without sheath

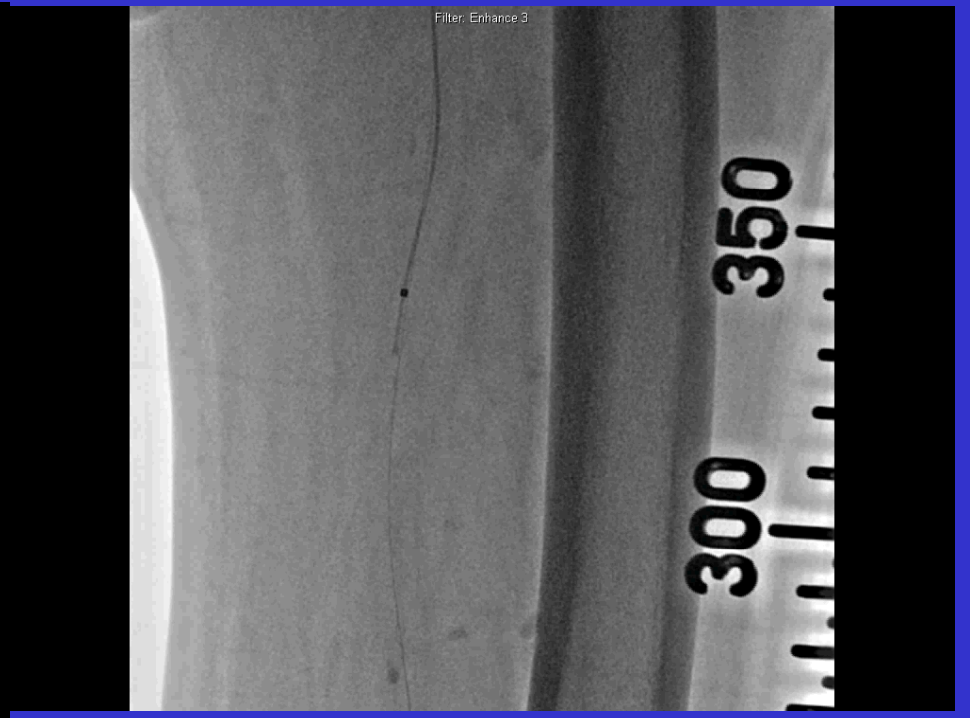
Retrograde approach





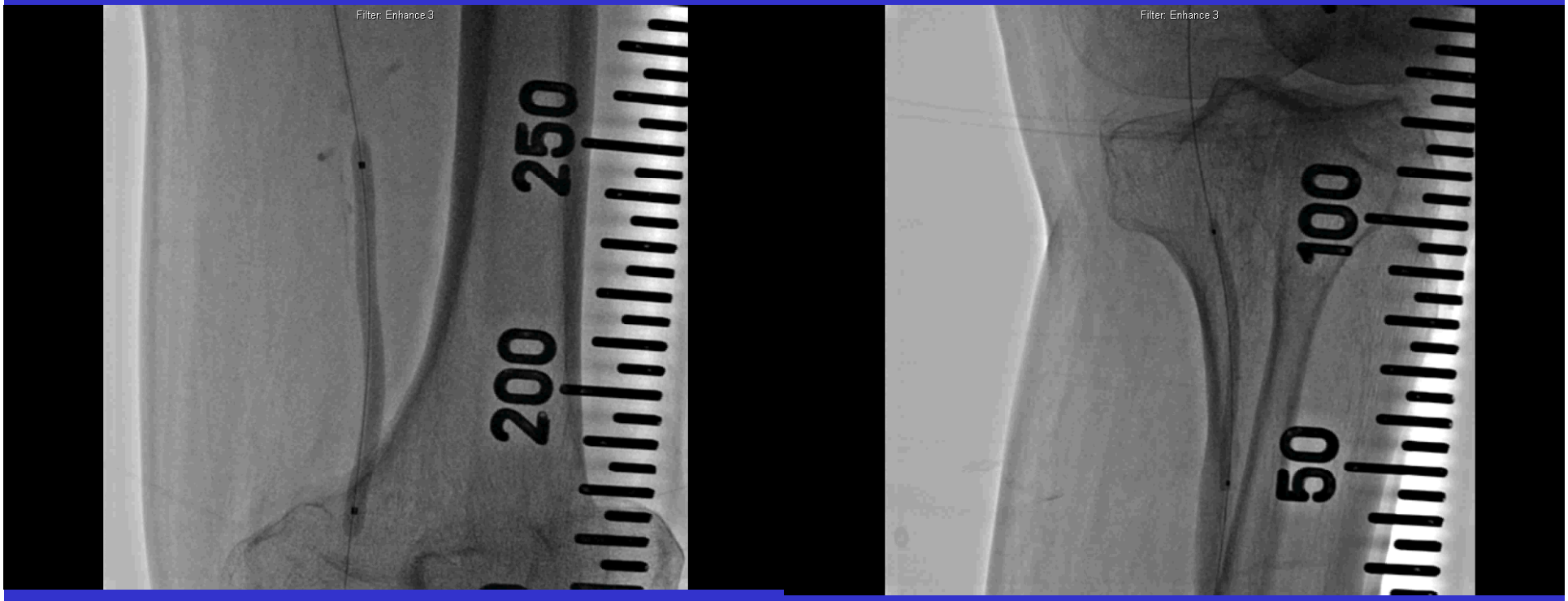
- Guidewire did not advance at the point of tibiopopliteal trunk
- we inserted 5F sheath in pedal artery for further strong back-up force
- Guidewire did not advance at the point of distal SFA
- Ballooning (3x60mm Savvy: retrograde,)

Successful wire passage



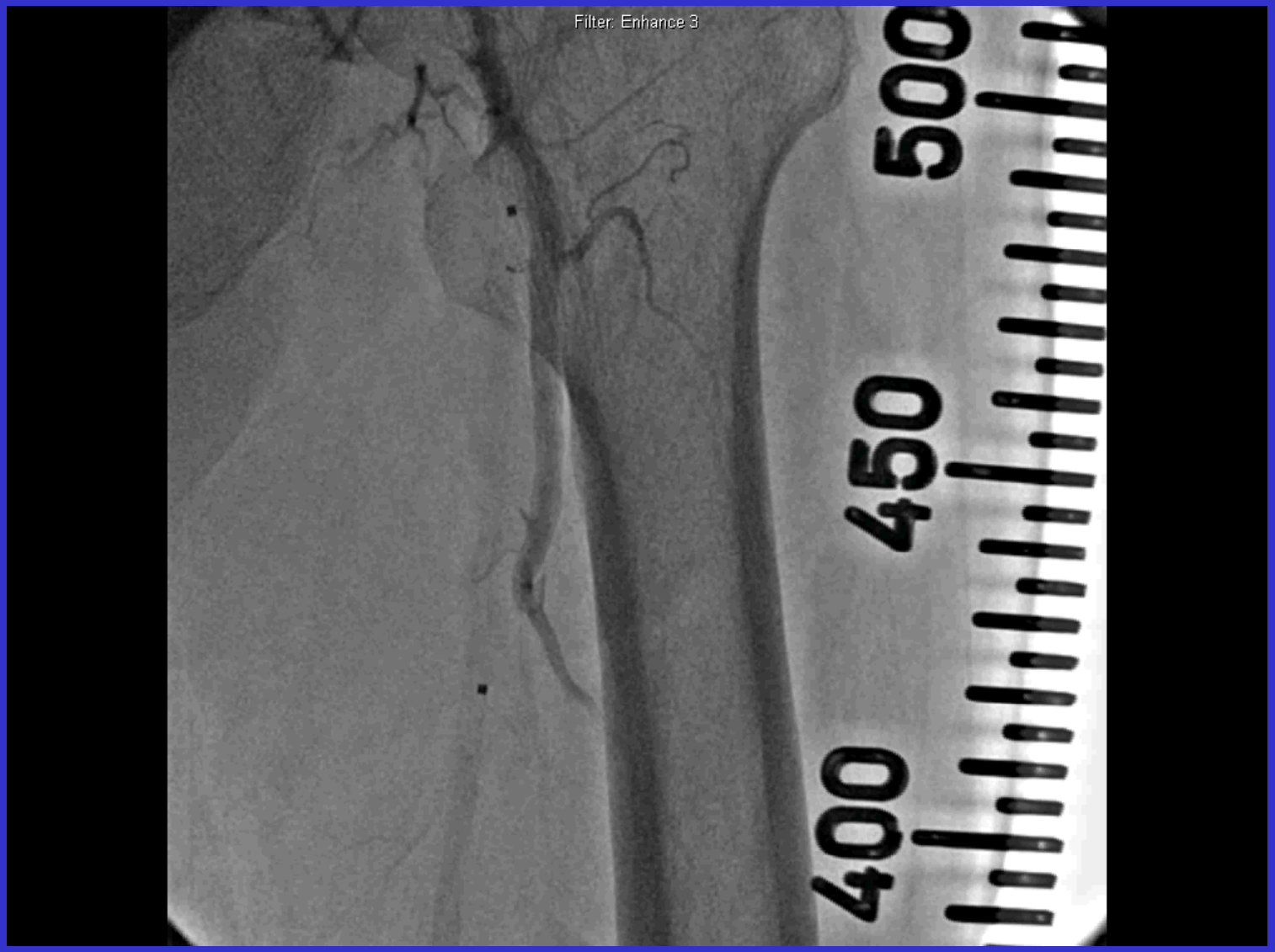
- Guidewire was advanced retrogradely , succeffully,
- After then, we advanced and enter the guidewire into Balkin sheath, and pulled the wire out of sheath

Ballooning



- 5x80mm Powerflex for LSFA
- 3x60mm Savvy for popliteal~posterior tibial artery

Final angiogram

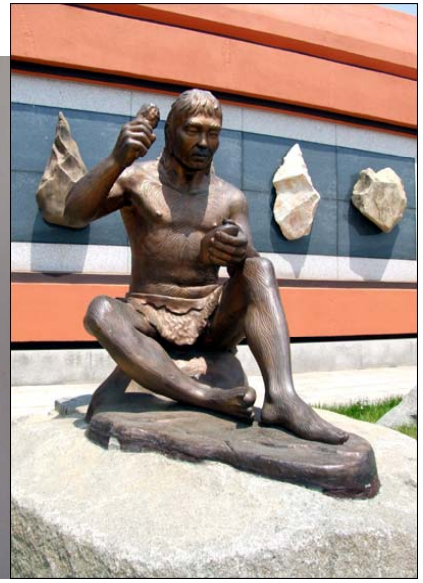


2 weeks later

3 weeks later

ABI of left leg : 0.65 → 0.93
Improved ulcerated lesion

Limitation of Device



Most important recent development for infrapopliteal EVT

- Long, low-profile balloons
- Tracking over 0.014 or 0.018 wire