Iliac CTO

Technical Lessons

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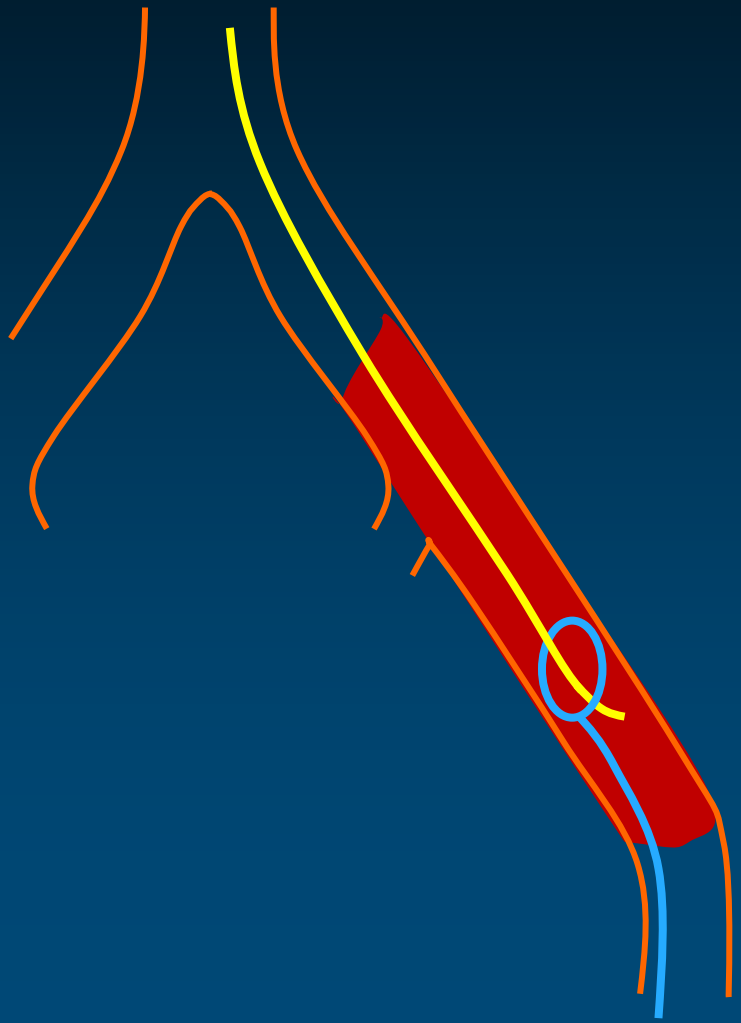
Iliac CTO Communication

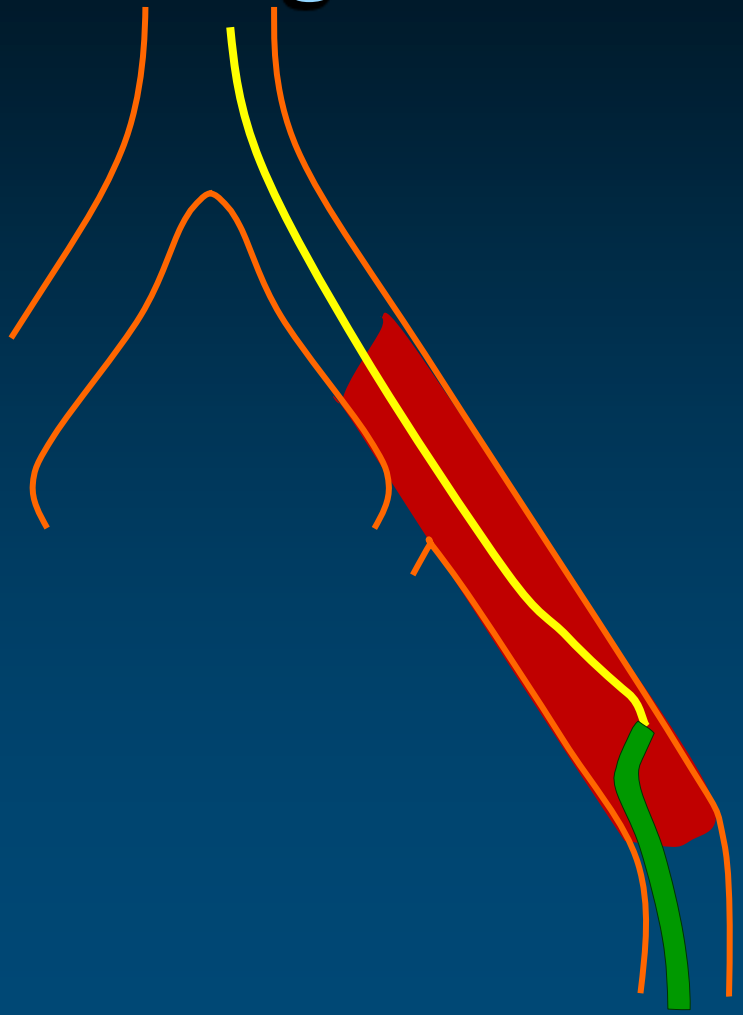
Iliac CTO Communication

Snaring



Iliac CTO Communication

Wiring to contralateral guiding / sheath



Iliac CTO Communication

Outback reentry to contra balloon

Courtesy from A. Schmidt

Iliac CTO Communication
Outback to aorta (flush occlusion)

Iliac CTO Communication

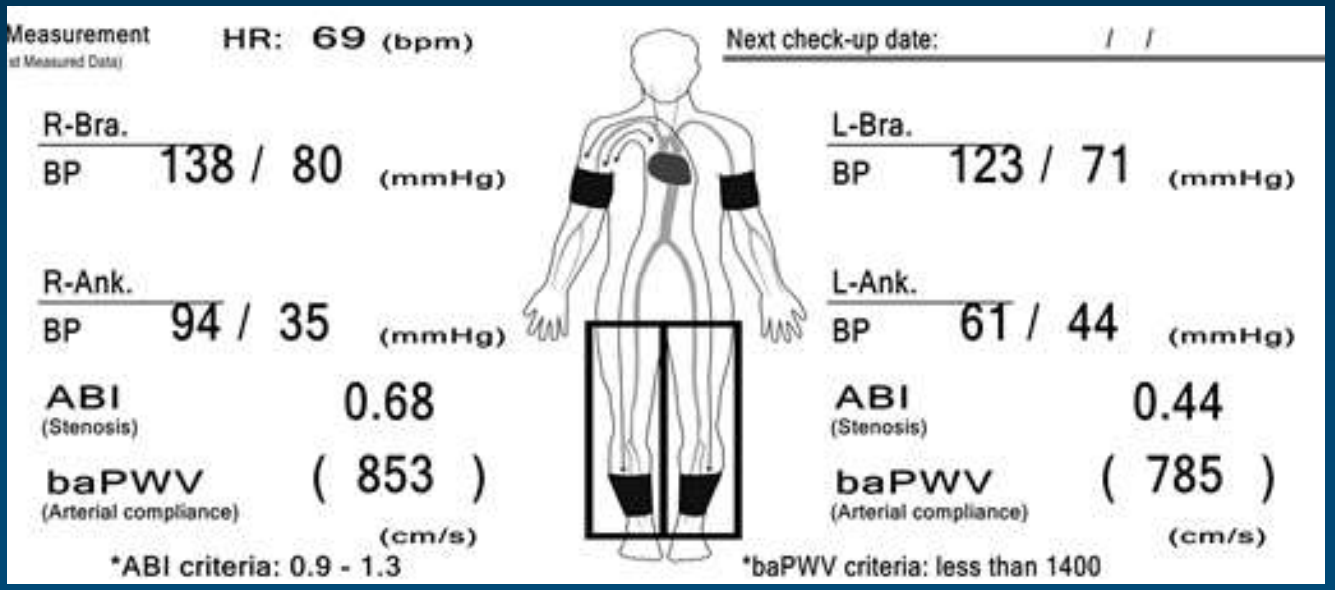
Outback to aorta (flush occlusion)

Aortoiliac Occlusion

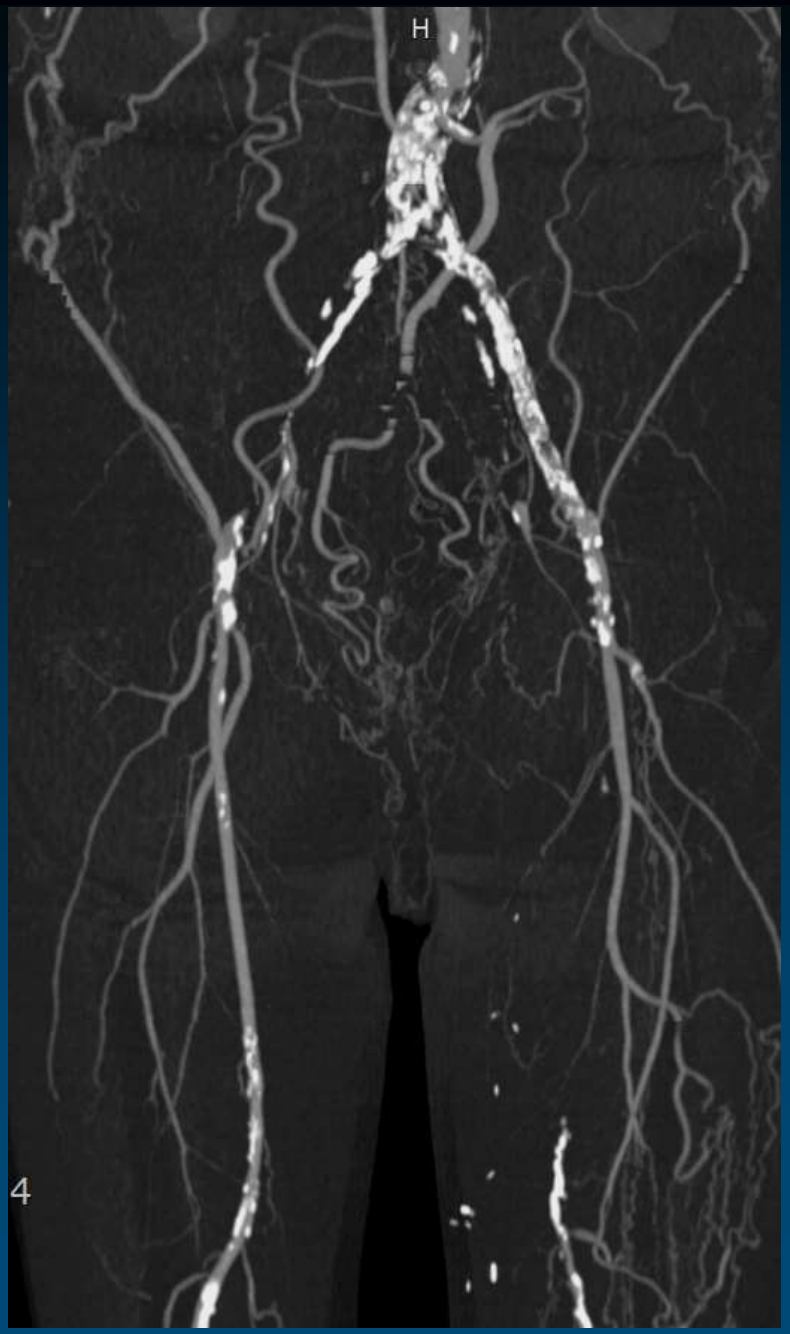
Aortobiiliac occlusion

- 67 years old man
- 5 YA, S/P CABG (LIMA-LAD, TRA-Dx-OM, SVG-PDA)
  → Stenting for LIMA graft 4 YA
- DM, HTN, Hyperlipidemia
- CKD, Cr 1.5
- 4YA, S/P Left iliac stenting
- Claudication IIb, both
- Normal EF with apical hypokinesia
- Both femoral pulse; not palpable

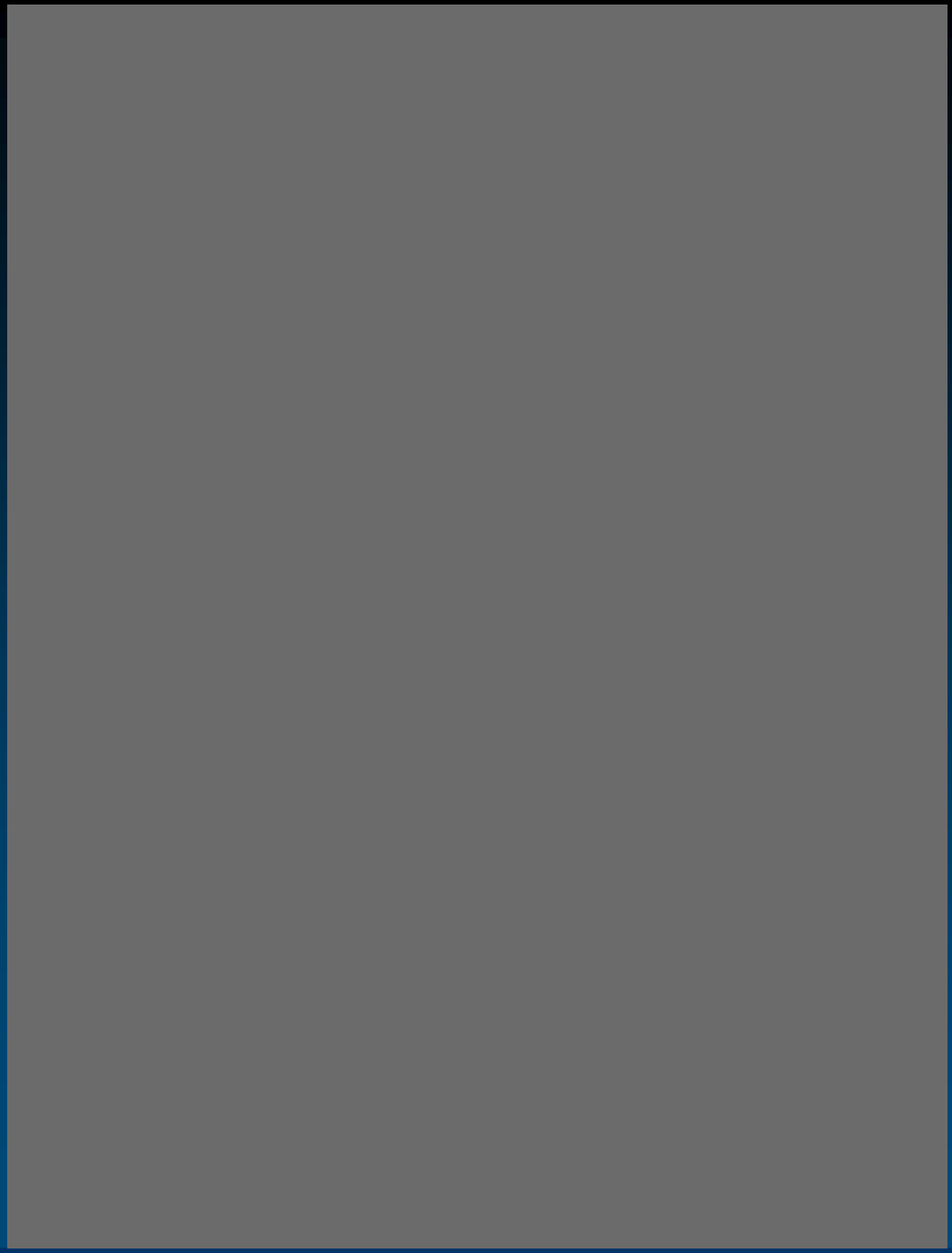

Mechanocardiogram/Pulse Volume Recorder
ECG:
PCG
R-Bra.
%MAP: 45%
L-Bra.
%MAP: 45%
R-Ank.
%MAP: 45%
L-Ank.
%MAP: 42%


Measurement
HR: 69 (bpm)
Next check-up date: / /
R-Bra.
BP 138 / 80 (mmHg)
L-Bra.
BP 123 / 71 (mmHg)
R-Ank.
BP 94 / 35 (mmHg)
L-Ank.
BP 61 / 44 (mmHg)
ABI
(Stenosis)
0.68
ABI
(Stenosis)
0.44
baPWV
(Arterial compliance)
(853)
(cm/s)
baPWV
(Arterial compliance)
(785)
(cm/s)
*ABI criteria: 0.9 - 1.3
*baPWV criteria: less than 1400

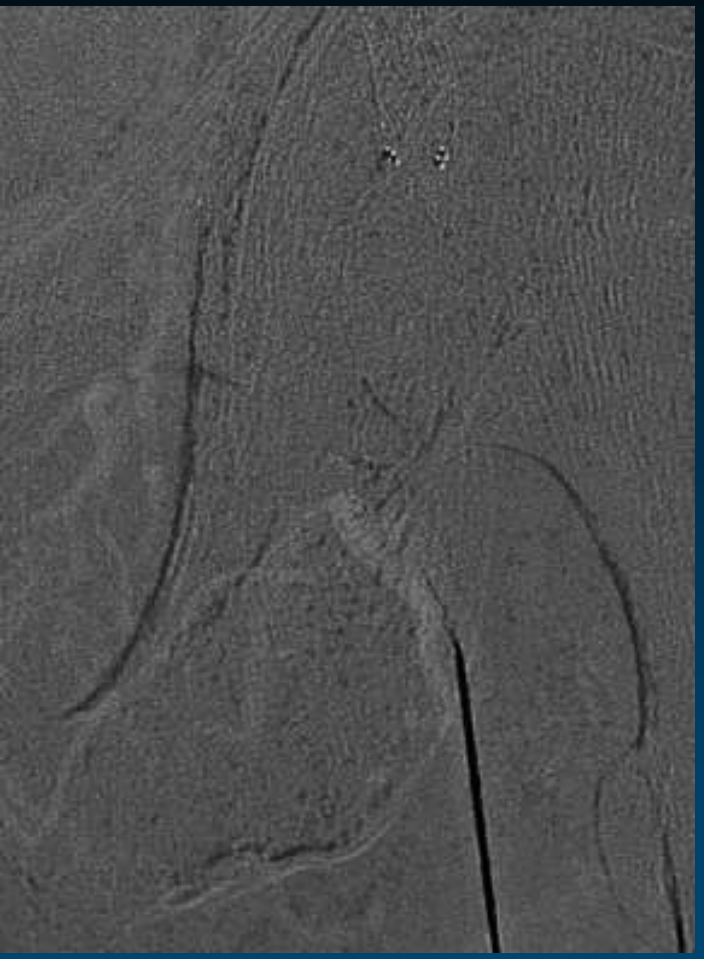
Aortobiiliac Occlusion



Right radial 5Fr



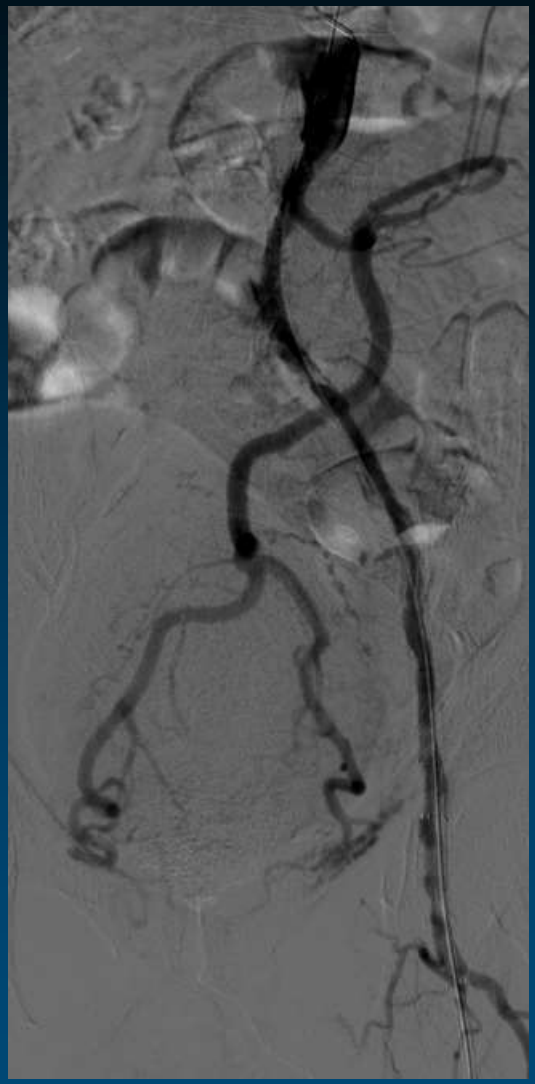
Bidirectional approach




TRI with 125cm Headhunter + Stiff Terumo

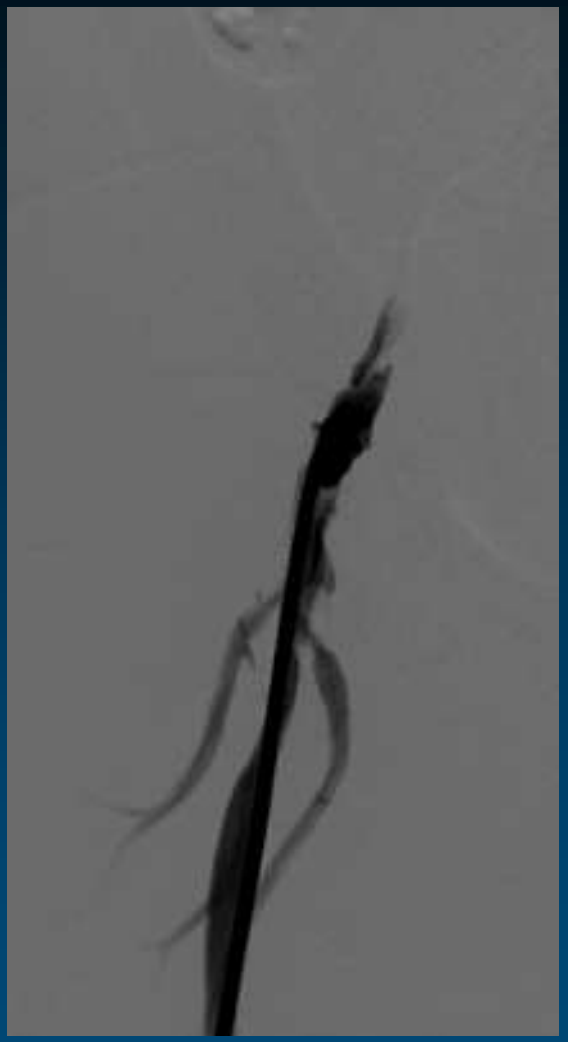
TFI with Glide + Terumo

Externalization of antegrade wire

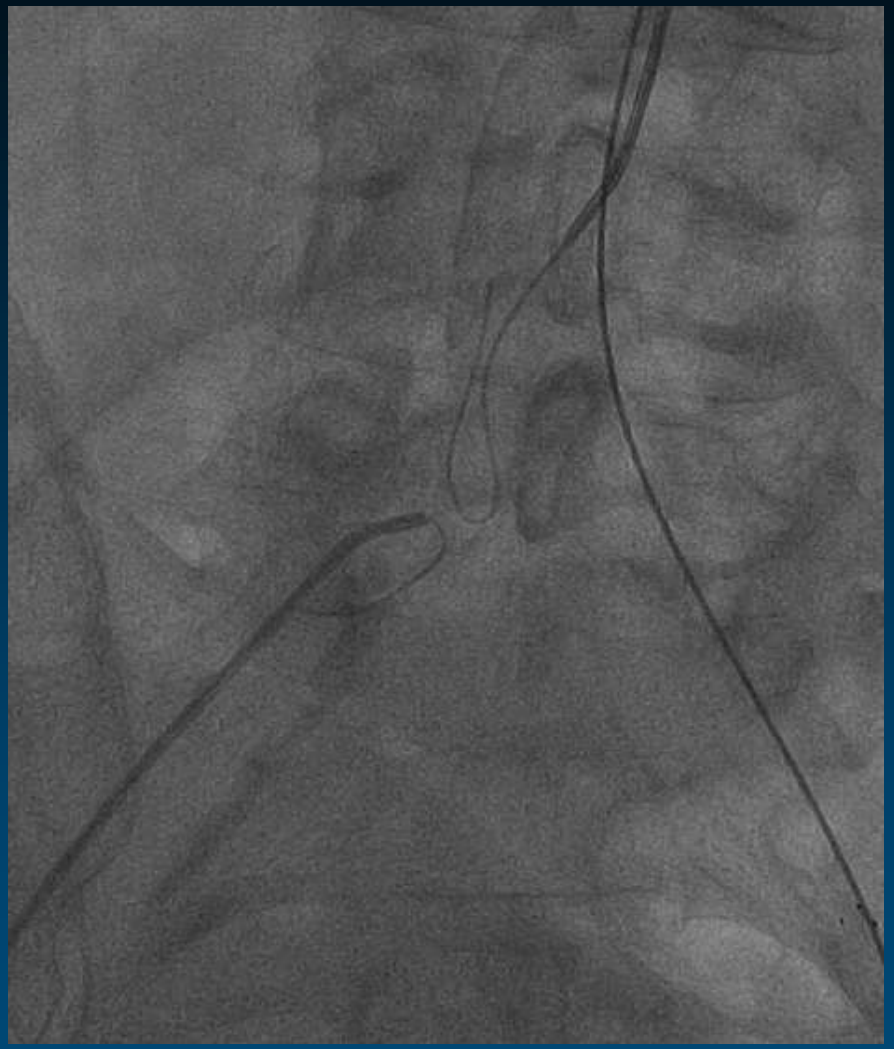


6.0x200mm, 10 atm

Fluoroscopy-guided pSFA puncture

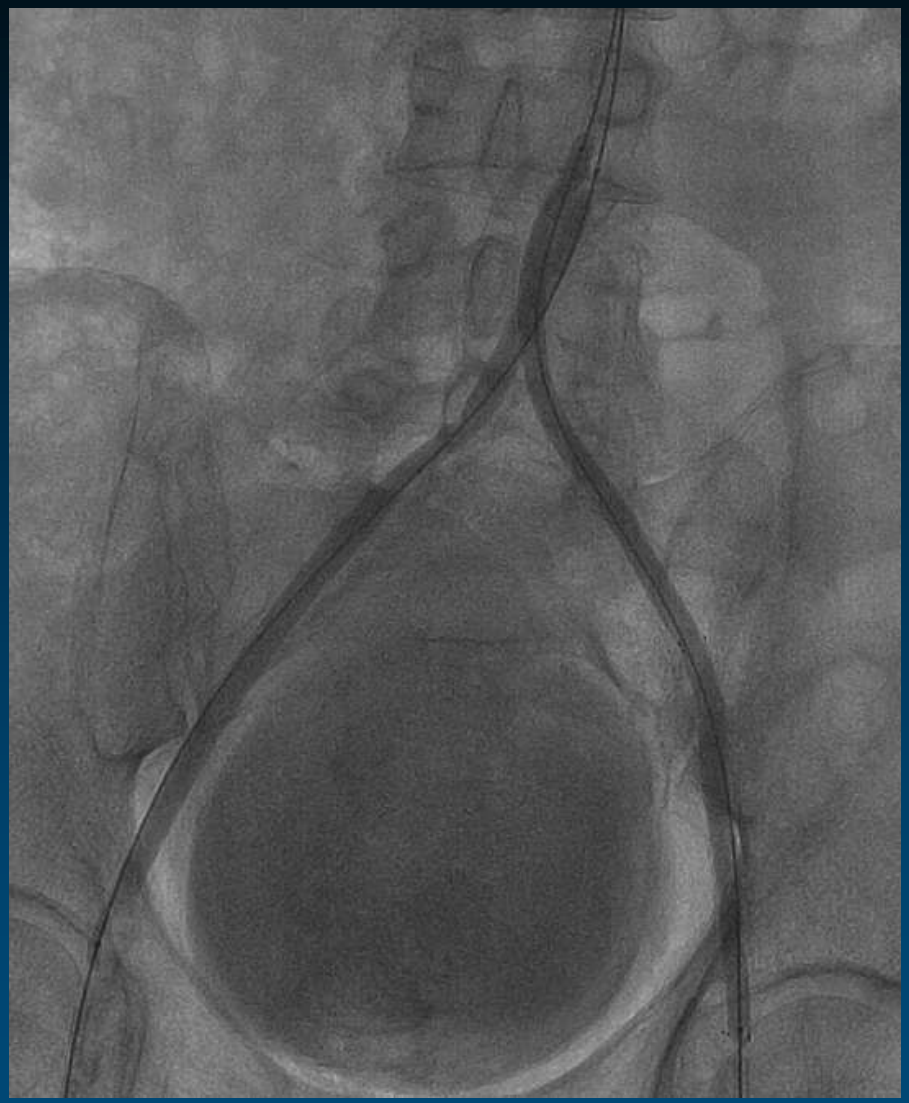


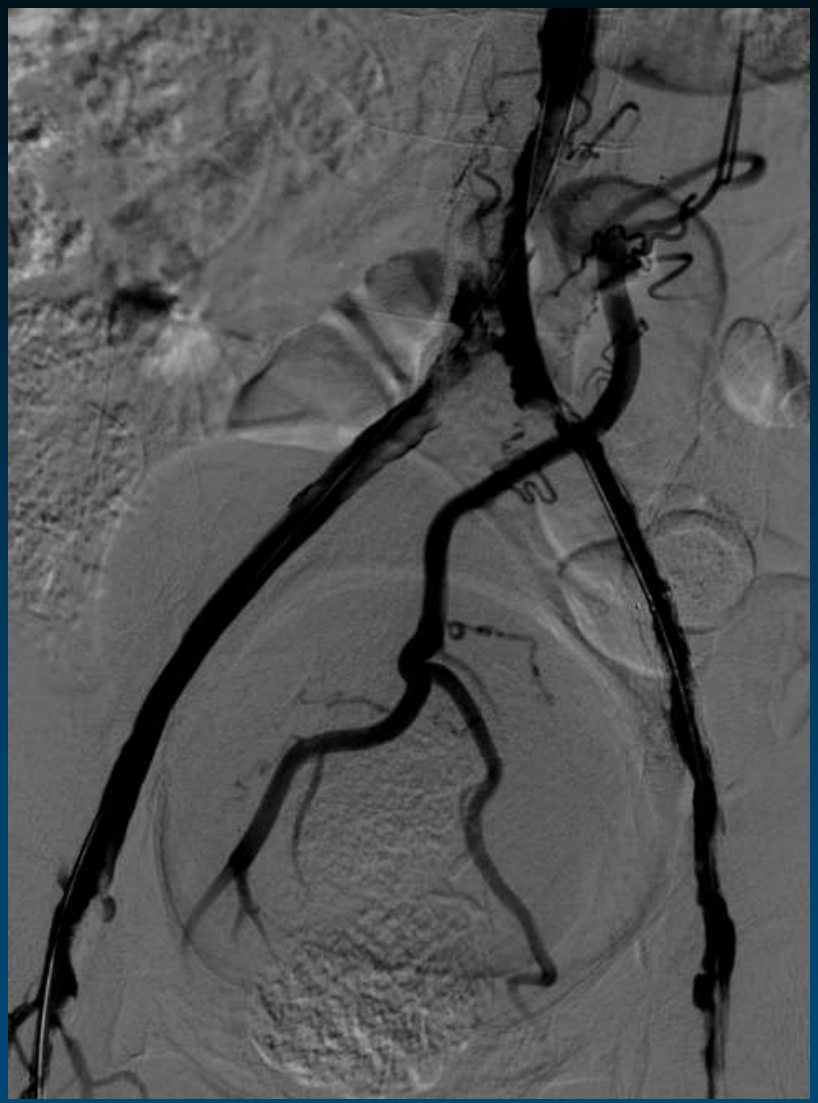
Bidirectional approach



Externalization of antegrade wire with snare

Kissing balloon angioplasty





7.0x200 mm & 6.0x200 mm

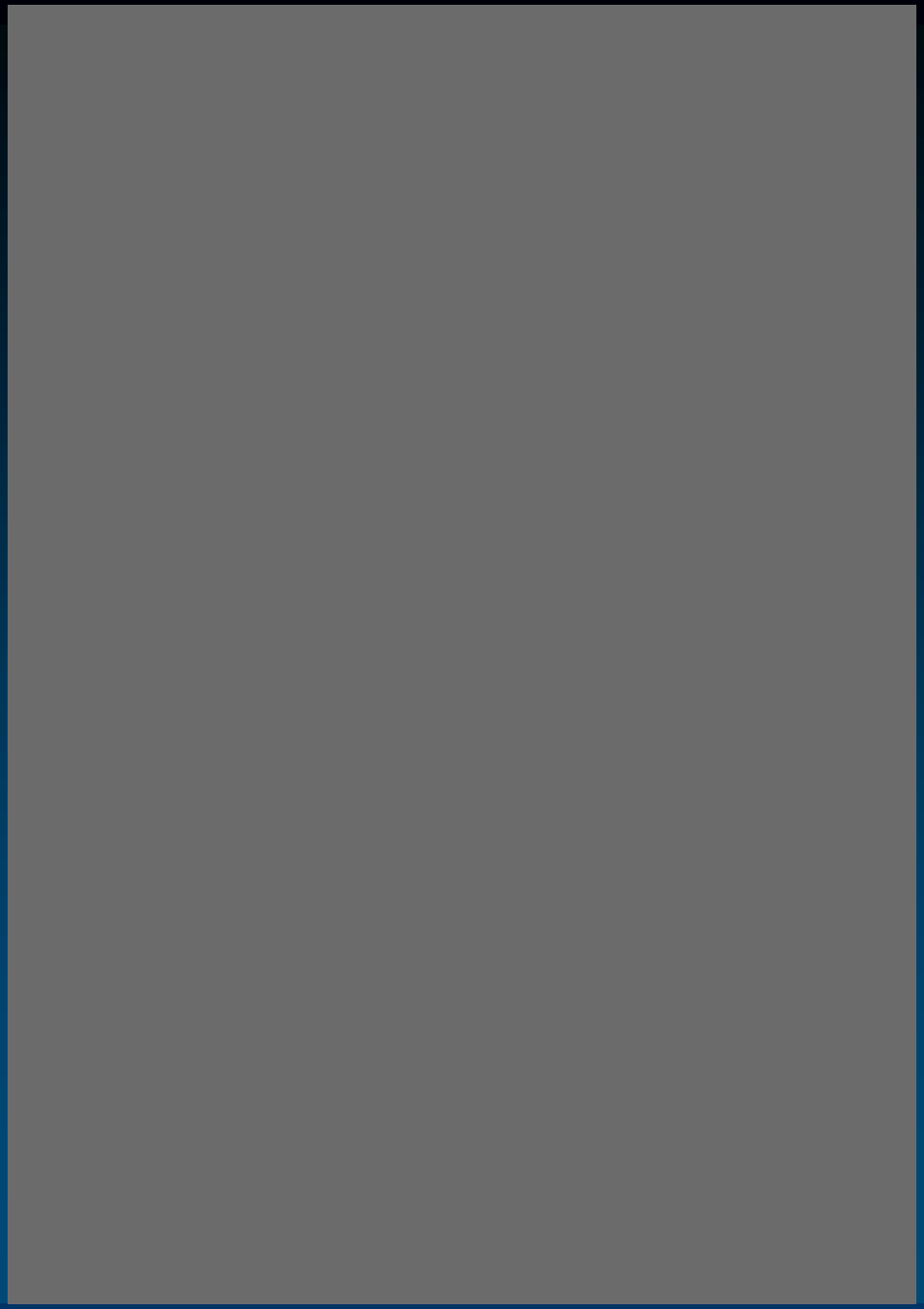
Kissing stenting

Kissing stenting; Two 12x80 mm, SMART stents
KB balloon; Two 10x60 mm balloons

Two more stents for iliac arteries

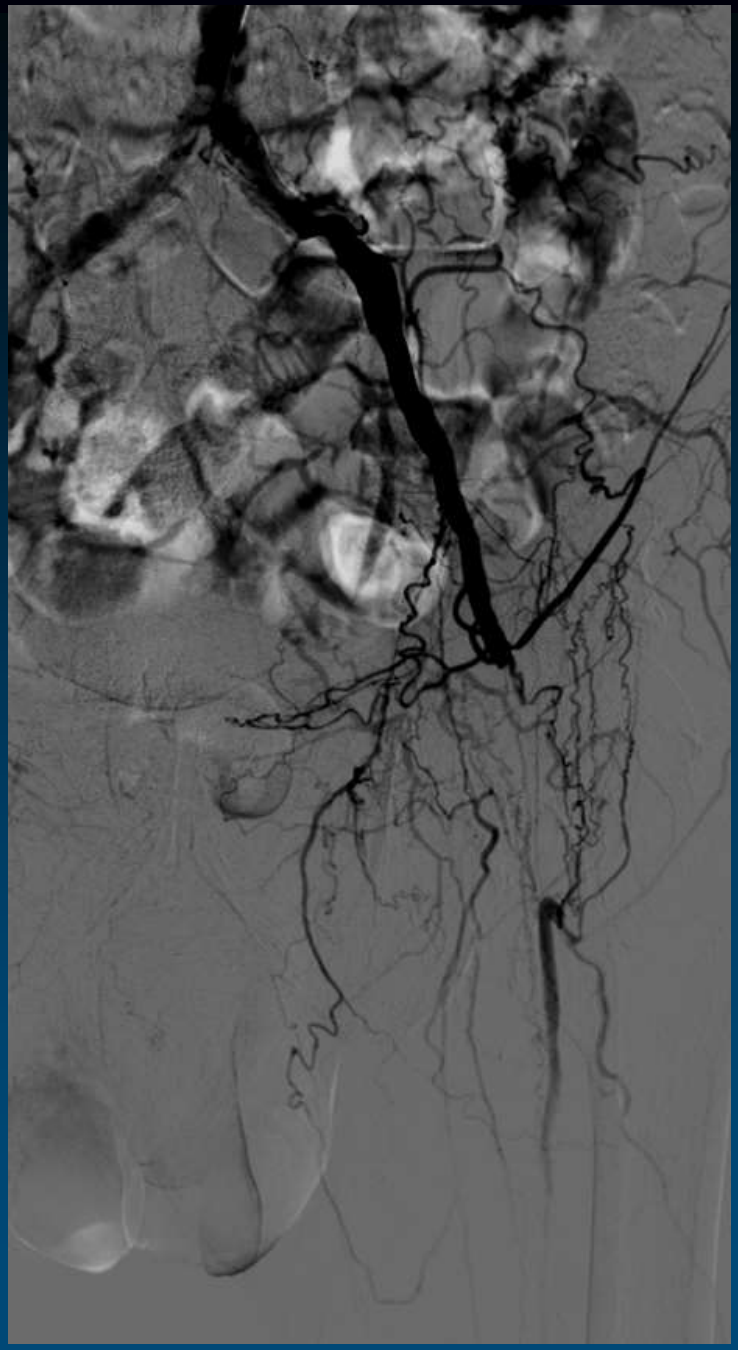
10x40mm SE stent →

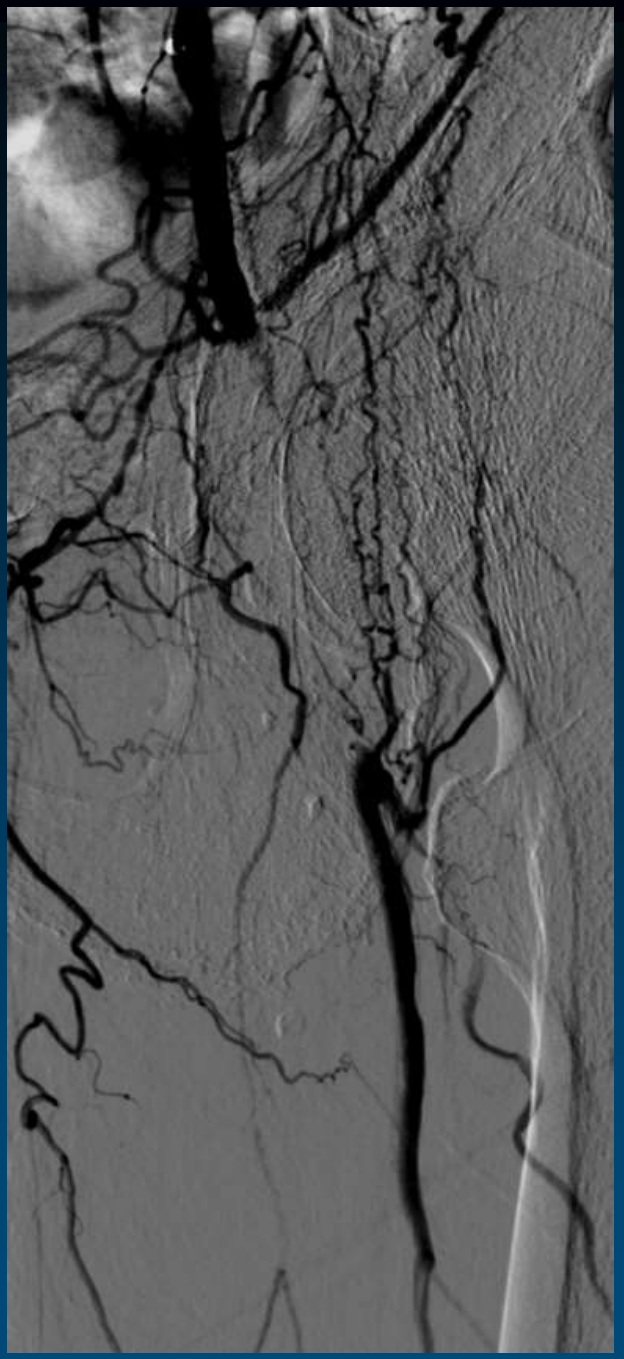
← 10x80mm SE stent



Iliac CTO Extended To Femoral Artery

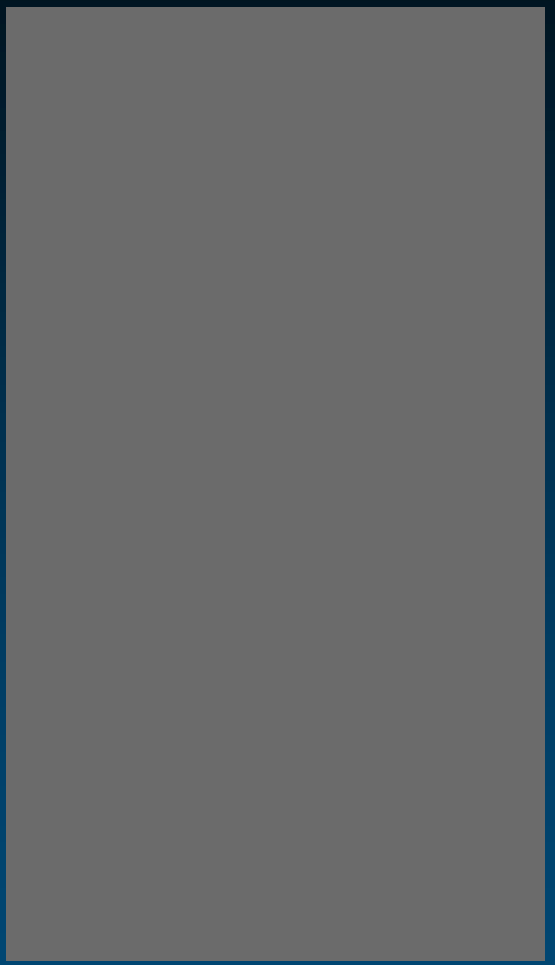
72 YO man, a hearing and speech-impaired person
HTN, Smoking
Left pretibial gangrene d/t repetitive hand scratch
NSTEMI with CHF





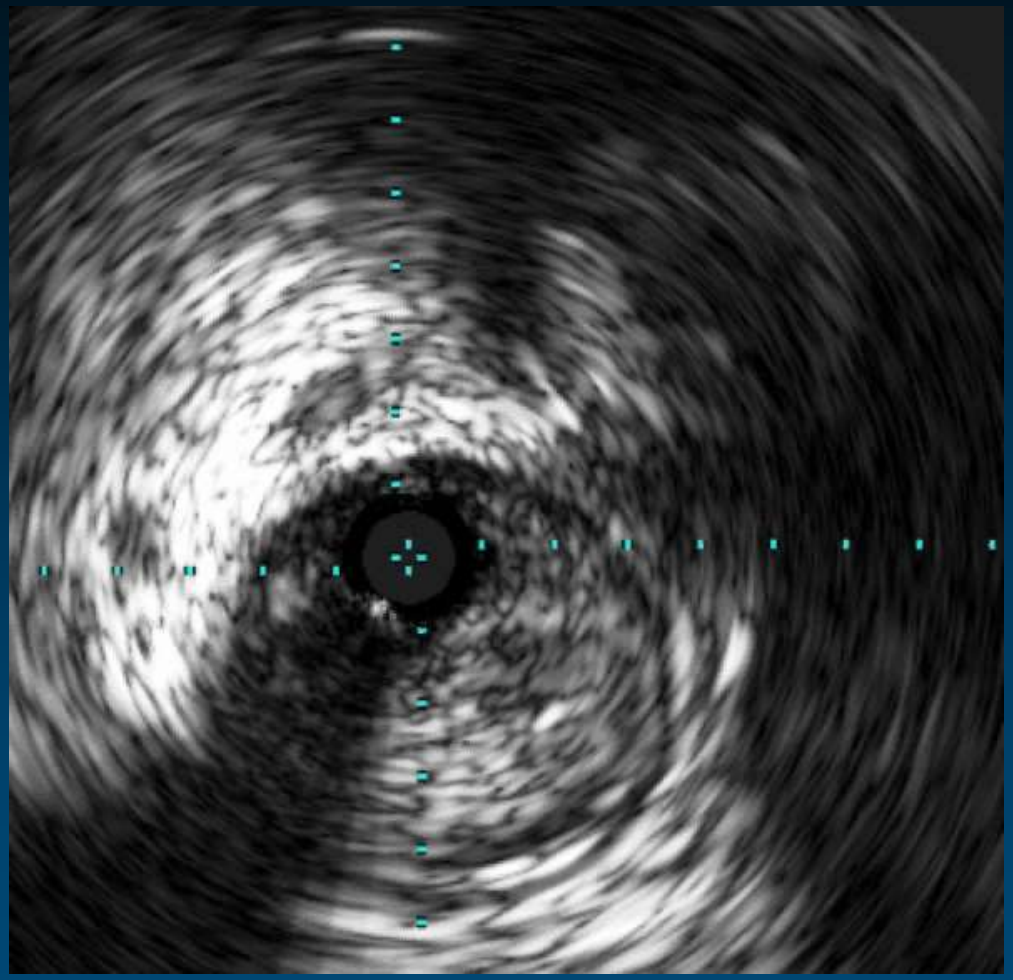
5 Fr Glide + Angled J Terumo

CFA to DFA ballooning



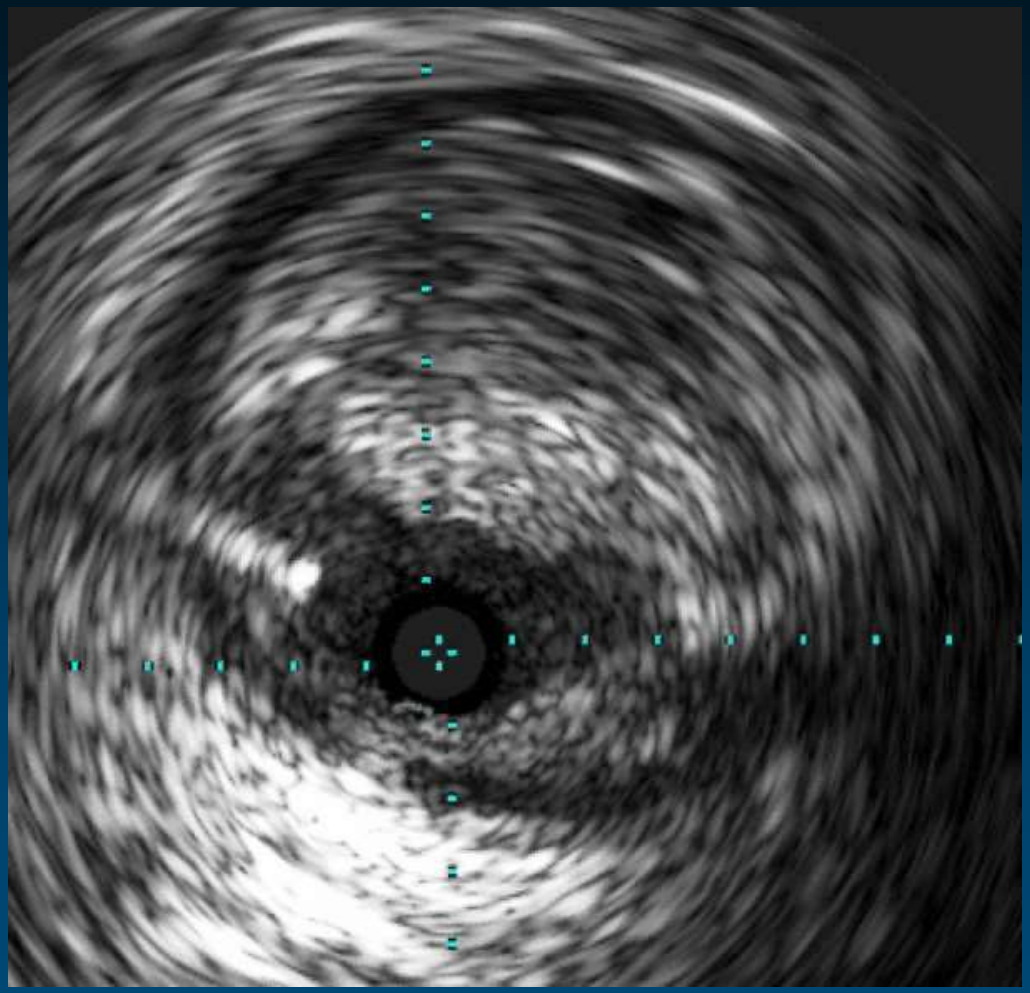
4.0×100 mm balloon, 10 atm

IVUS-guided SFA ostial wiring



0.014” GW + Finecross

IVUS-guided SFA ostial wiring

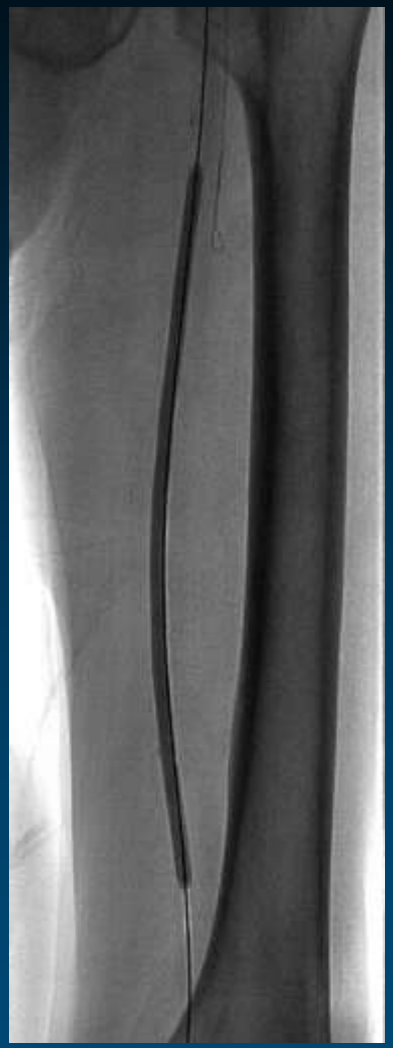


5 Fr Glide + 0.035” Terumo wire

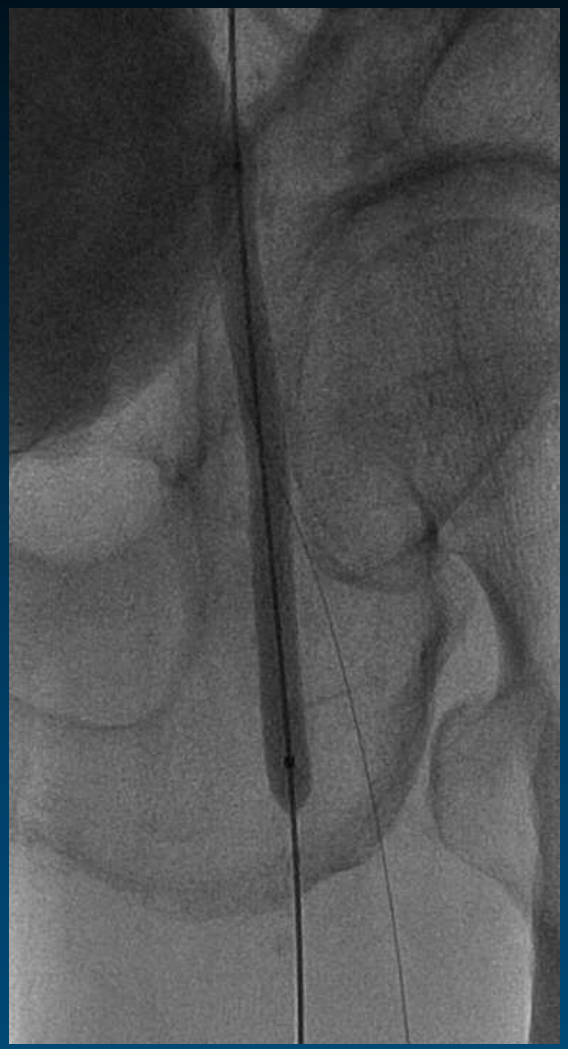
Subintimal Angioplasty

5 Fr Glide + Angled-J Terumo wire

Balloon angioplasty

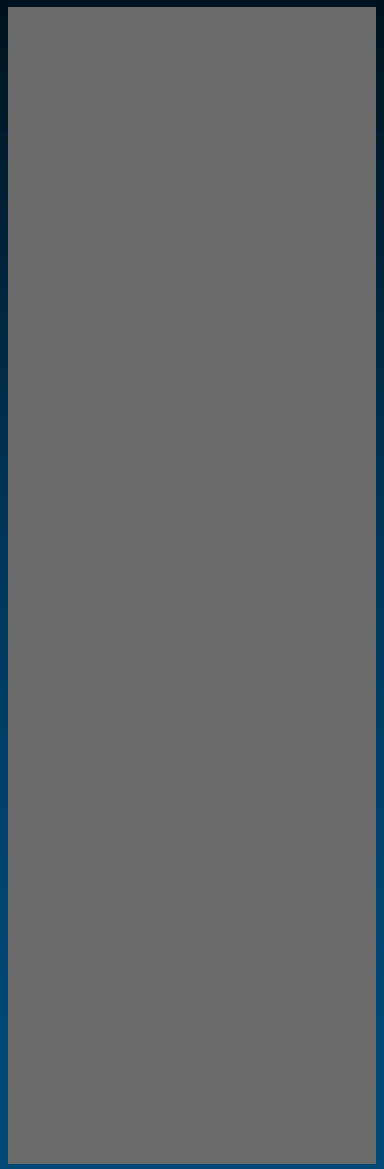
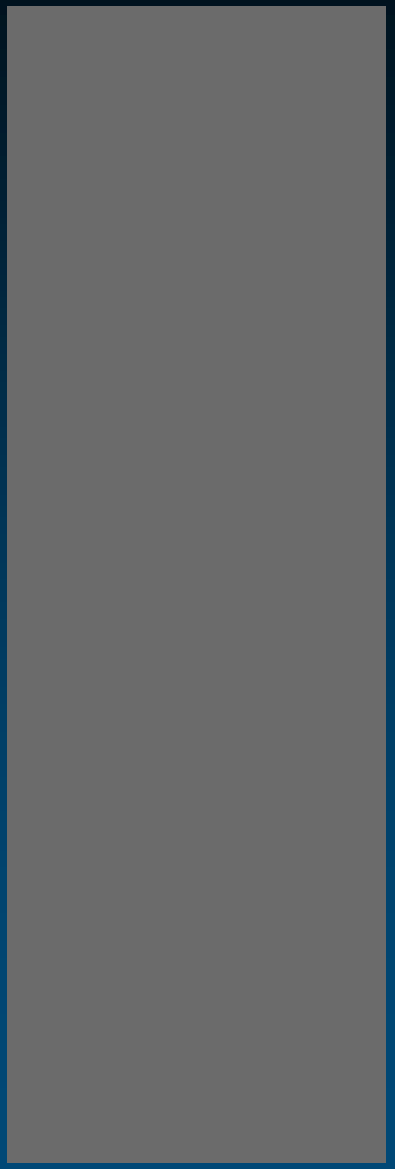
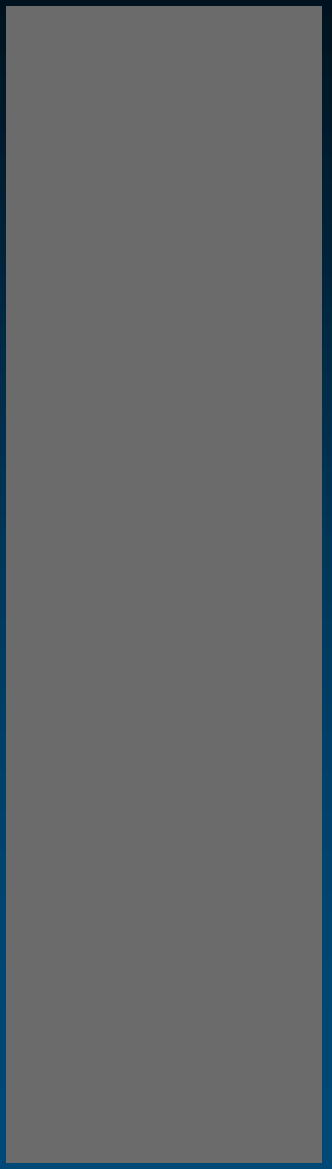


5.0 × 200 mm



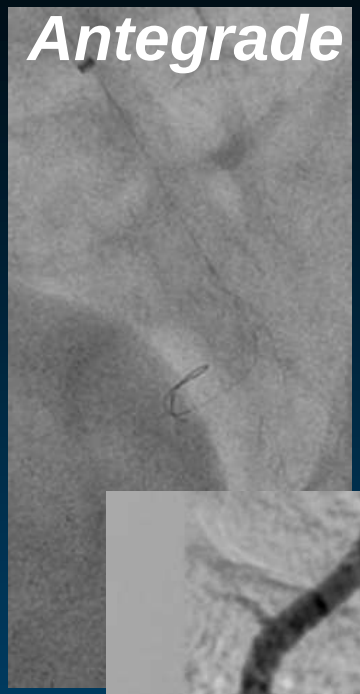
6.0 ×100 mm

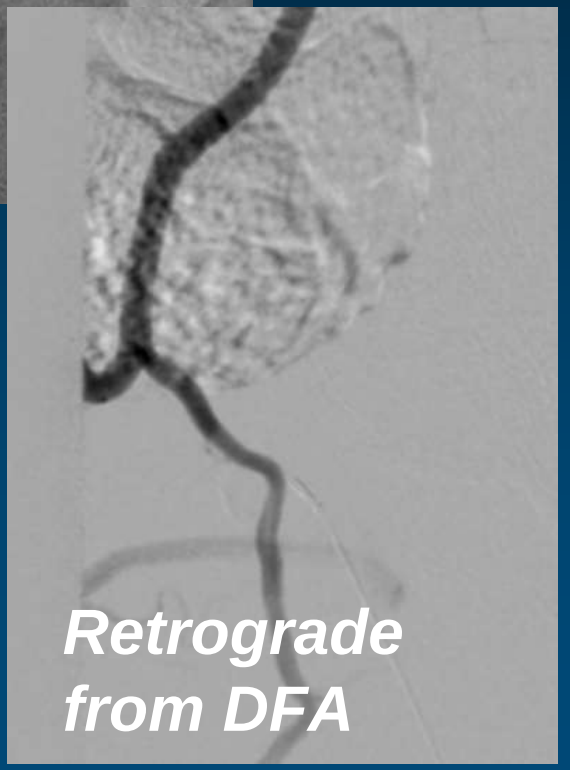
Final Angiogram

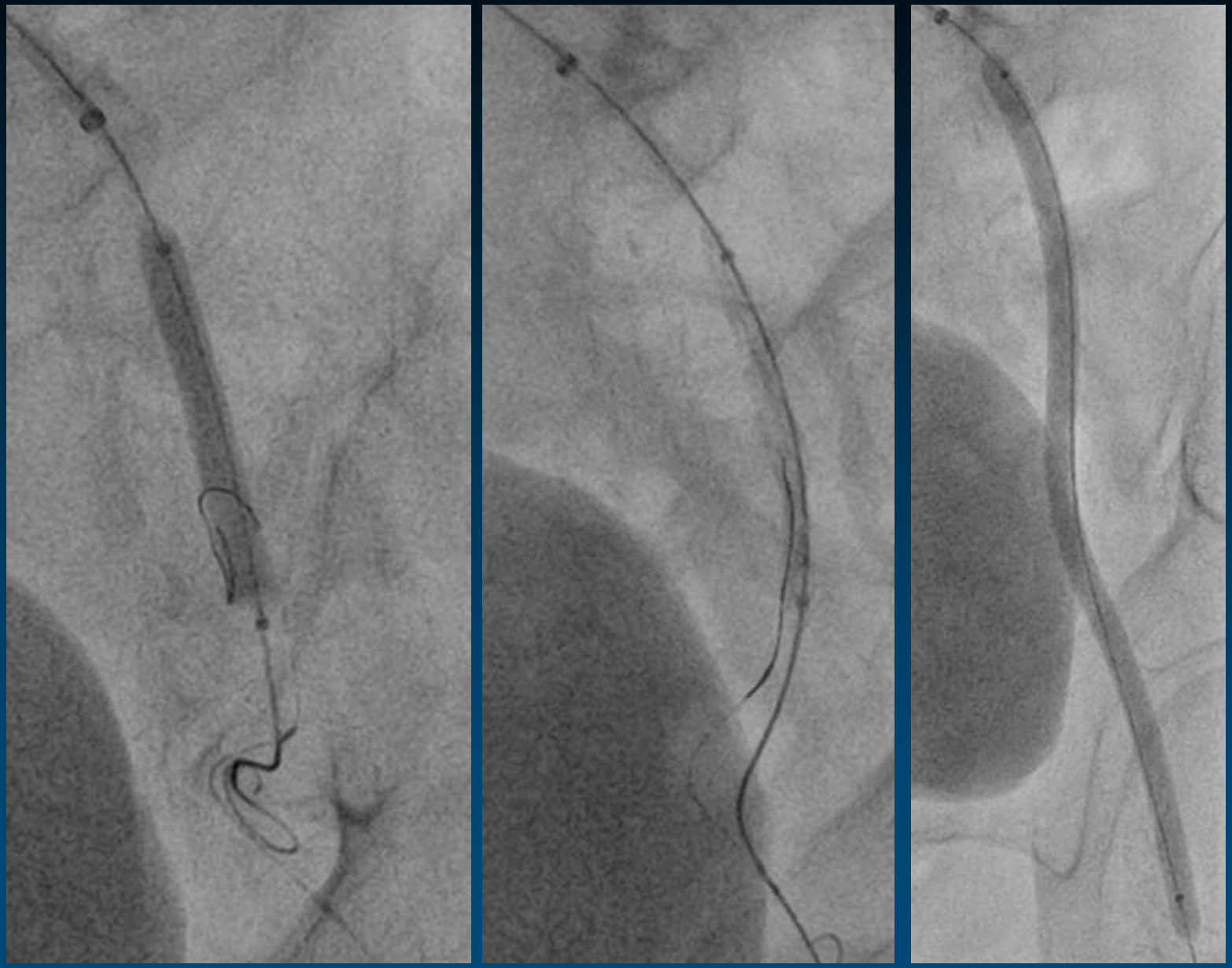
PTA → Debridement → Skin graft

Ilio-SFA CTO, M/71, Rutherford III claudication

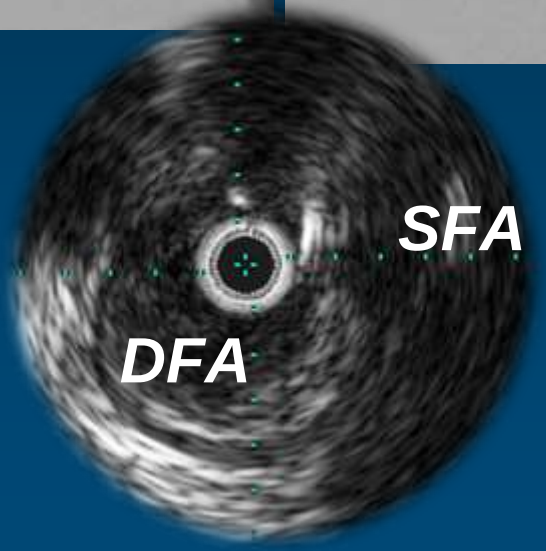


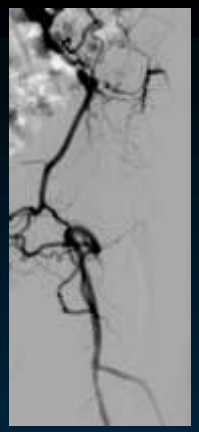


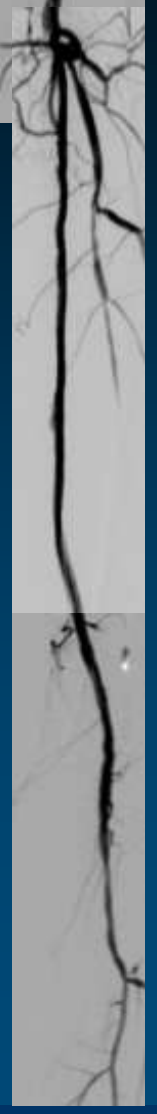
Ilio – CFA CTO recanalization



Ilio – SFA CTO

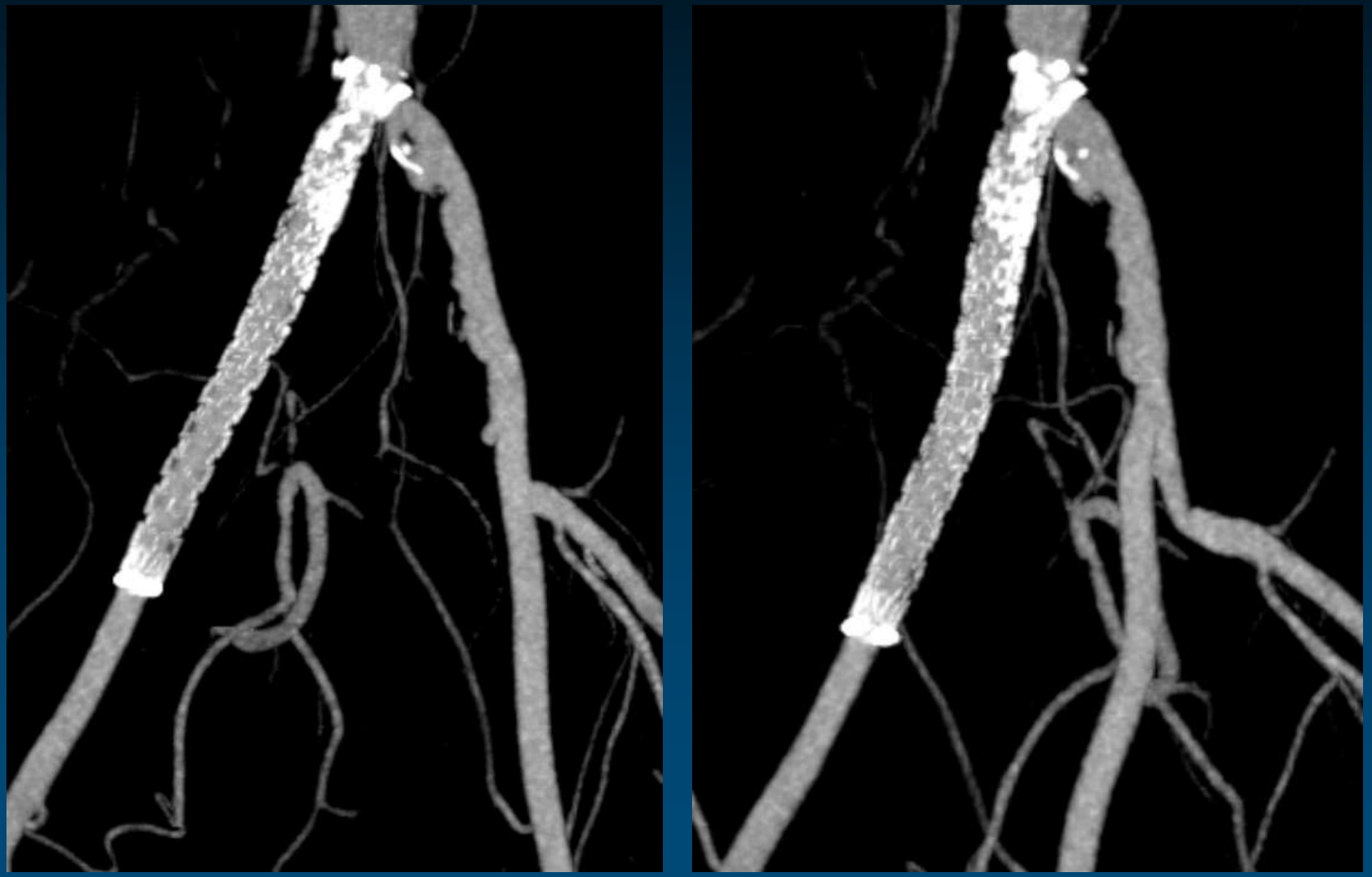


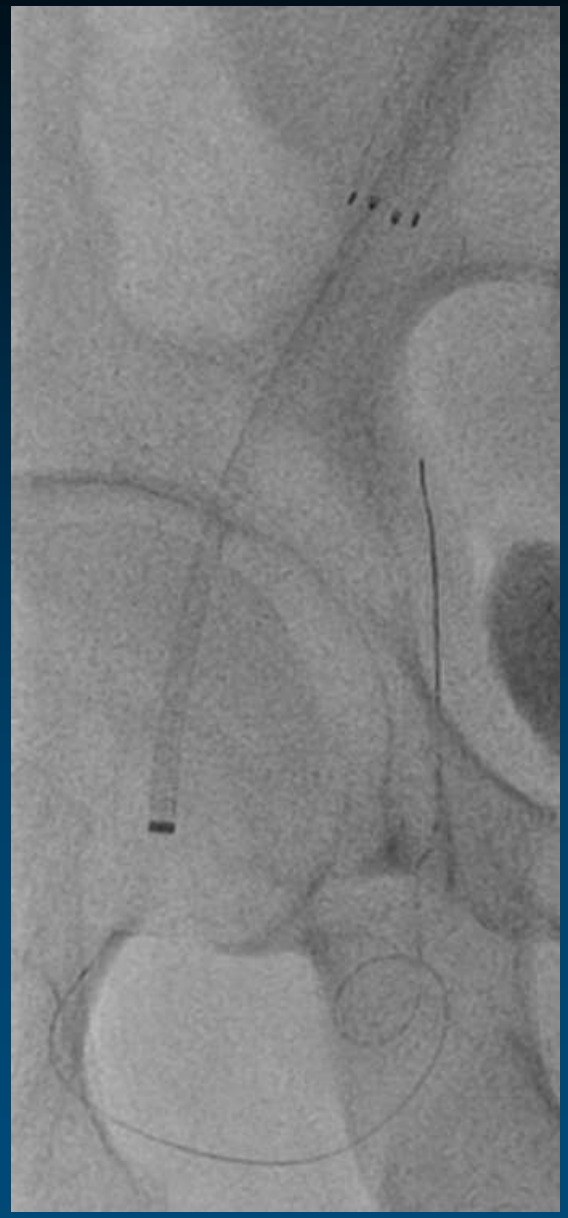


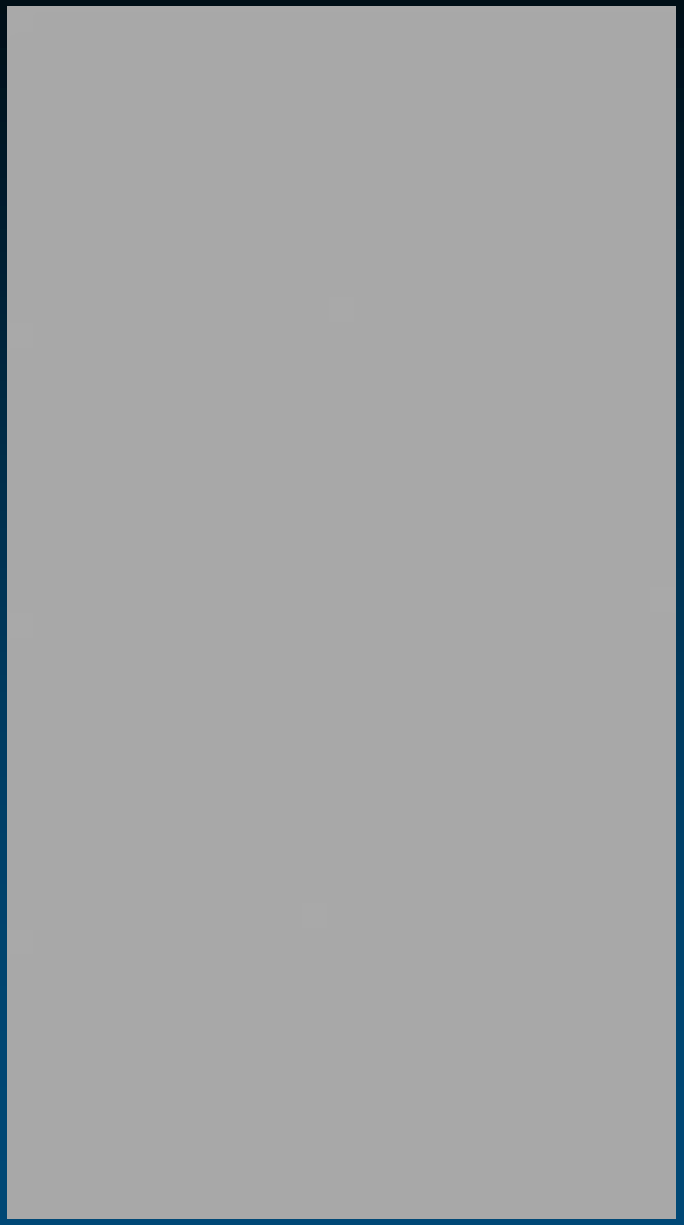


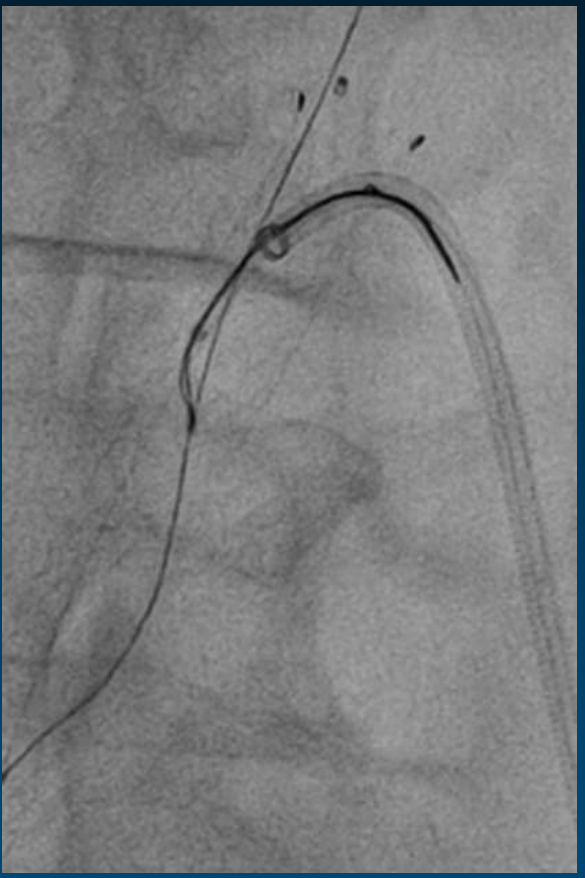
Occlusion of Internal Iliac Ostium

M/56 S/O Right CIA-EIA stenting, 2YA
→ Recurred buttock claudication, Rutherford 2, R>L



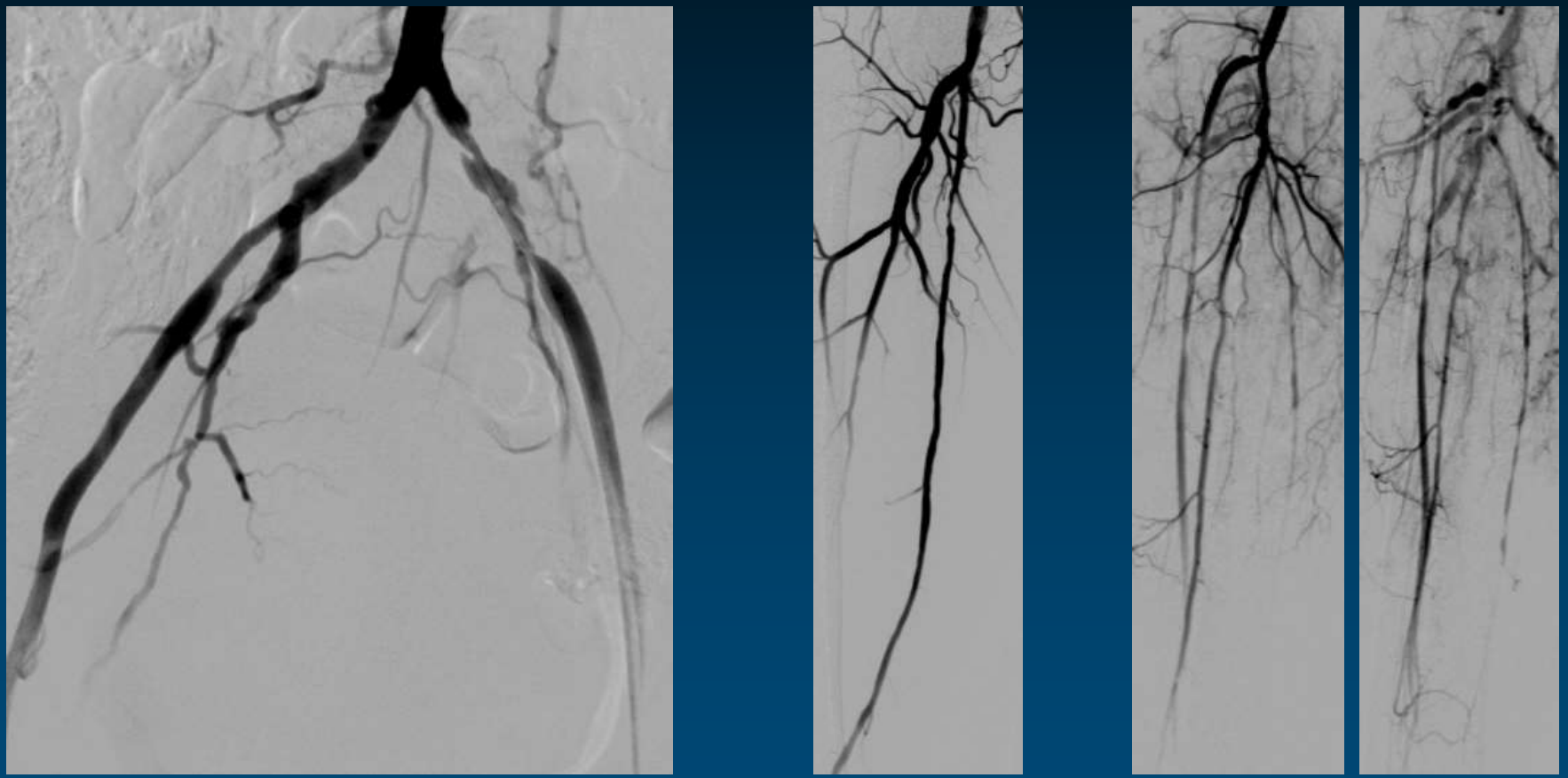


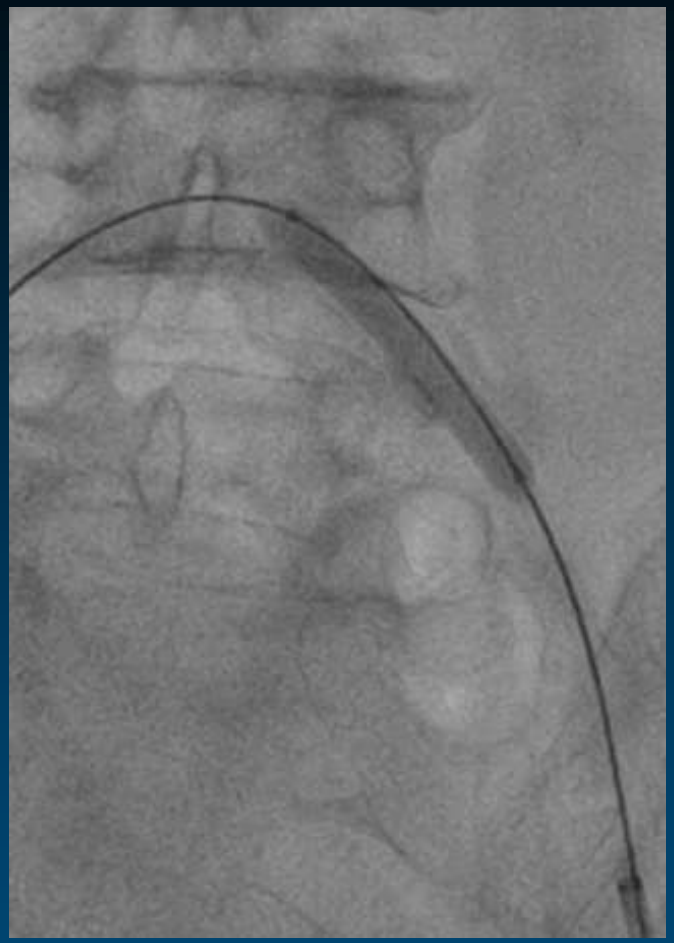




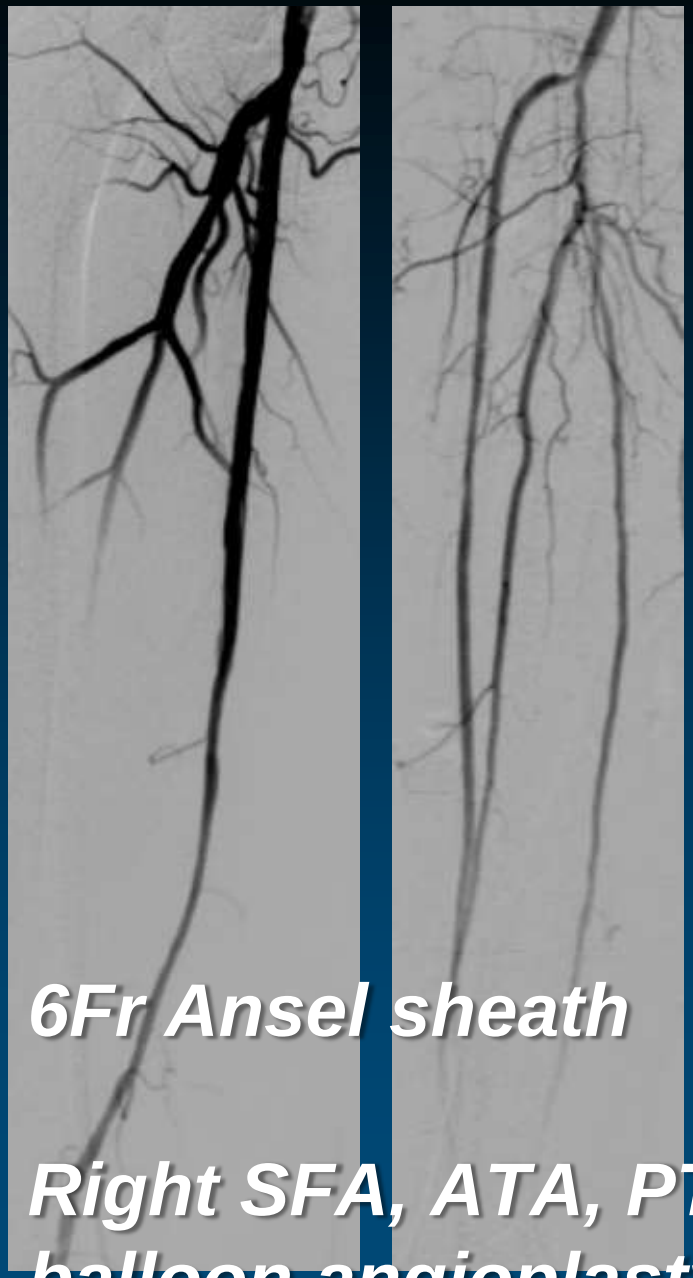
Management of Complication

F/63, DM, Fontaine IIa claudication, R > L
ABI 0.77/0.85



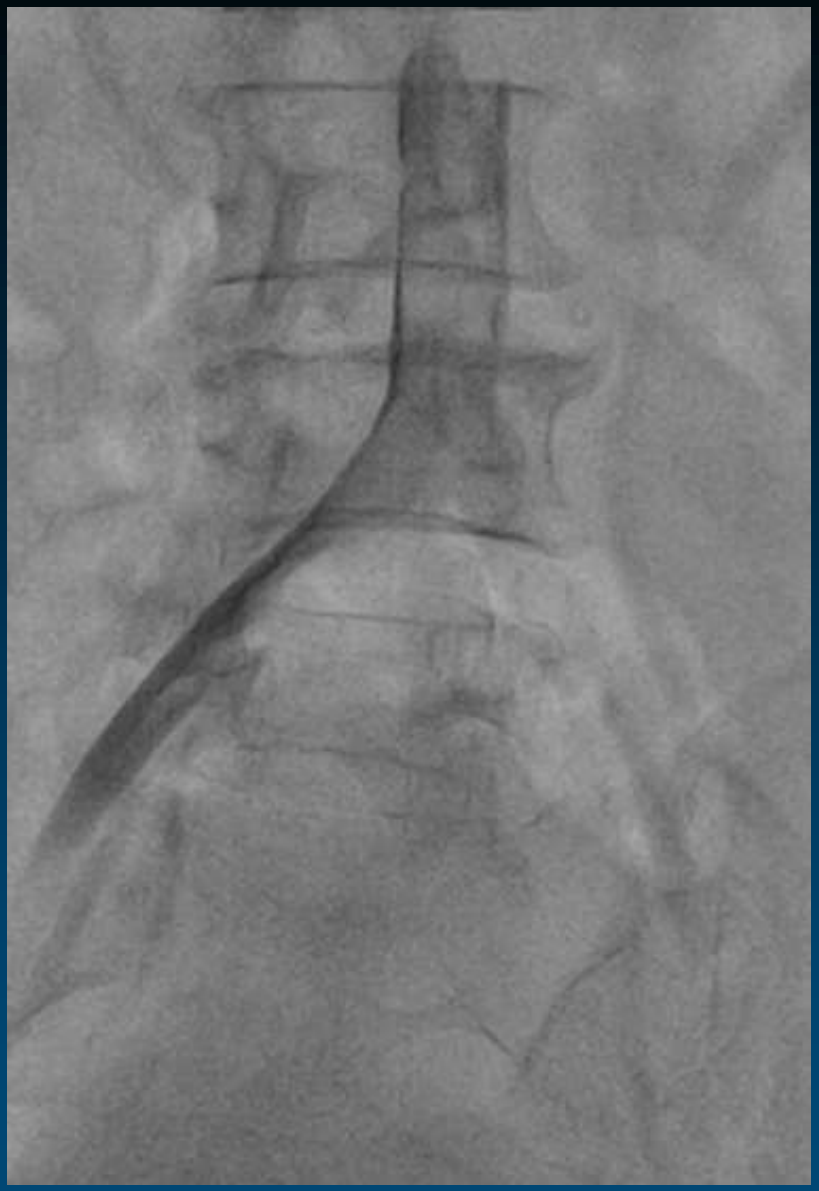


6.0x40mm

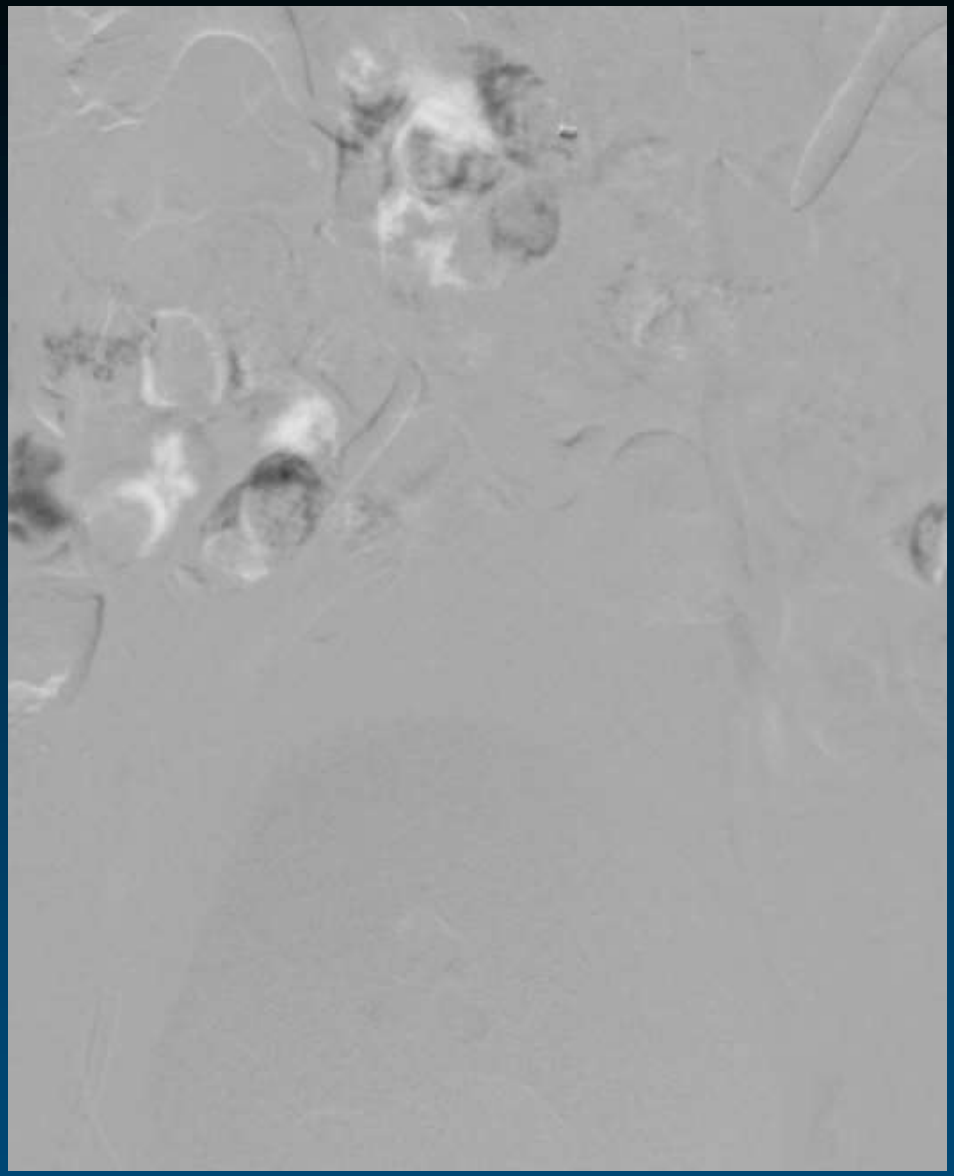


6Fr Ansel sheath

Right SFA, ATA, PTA balloon angioplasty



Oops



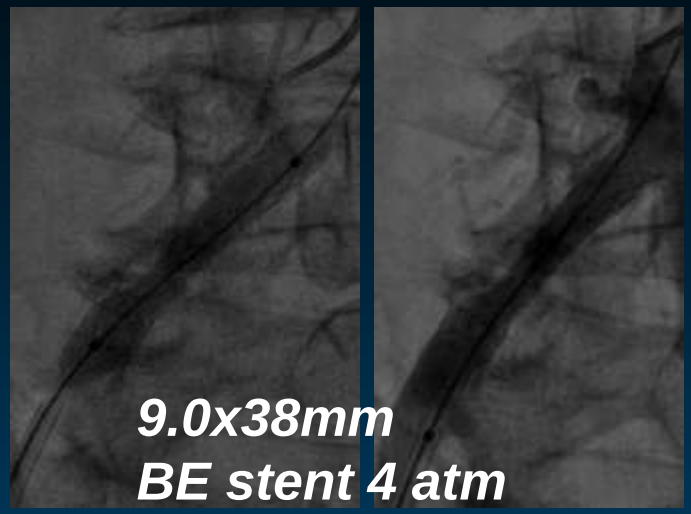
Transradial 5 Fr 110cm shuttle
Right femoral 7 Fr long sheath

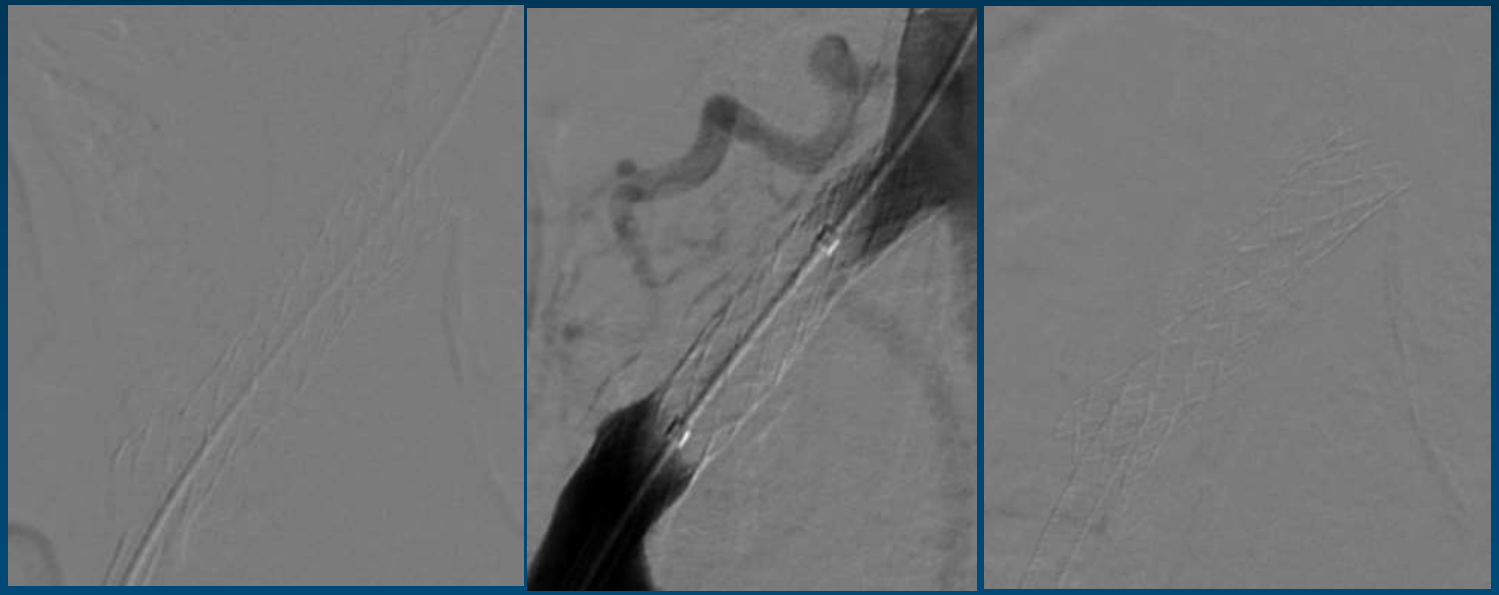
Antegrade wiring for left iliac

Kissing balloon

Kissing stenting;
8.0x150 mm & 8.0x120 mm

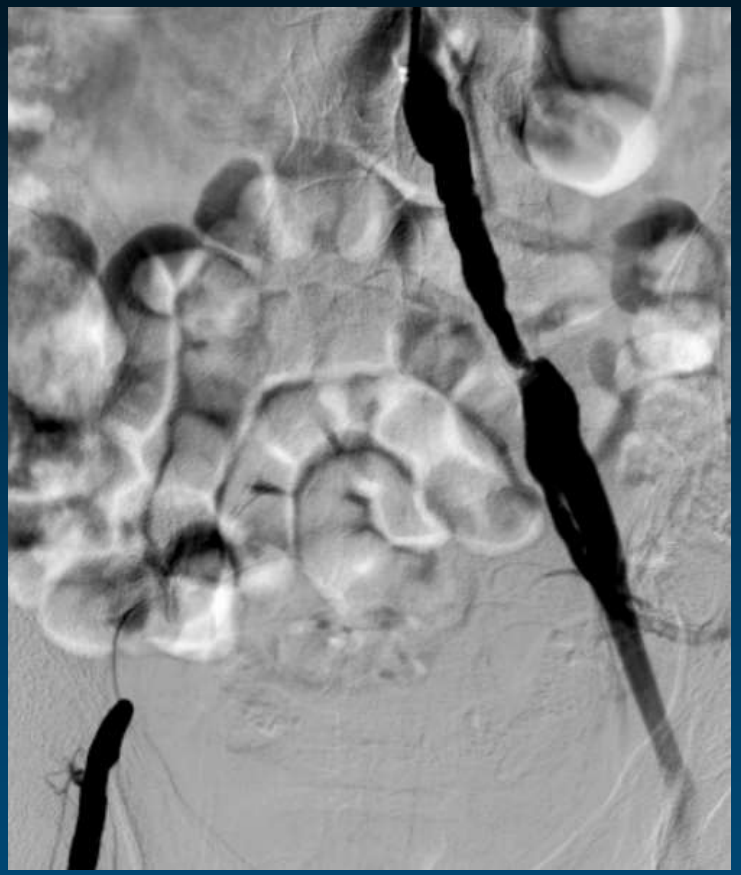
M/82, HTN, 50m claudication





Confined rupture → prolonged ballooning → sealed

M/65, HTN, S/P Lung ca op
Both Fontaine IIb claudication, ABI 0.52/0.57

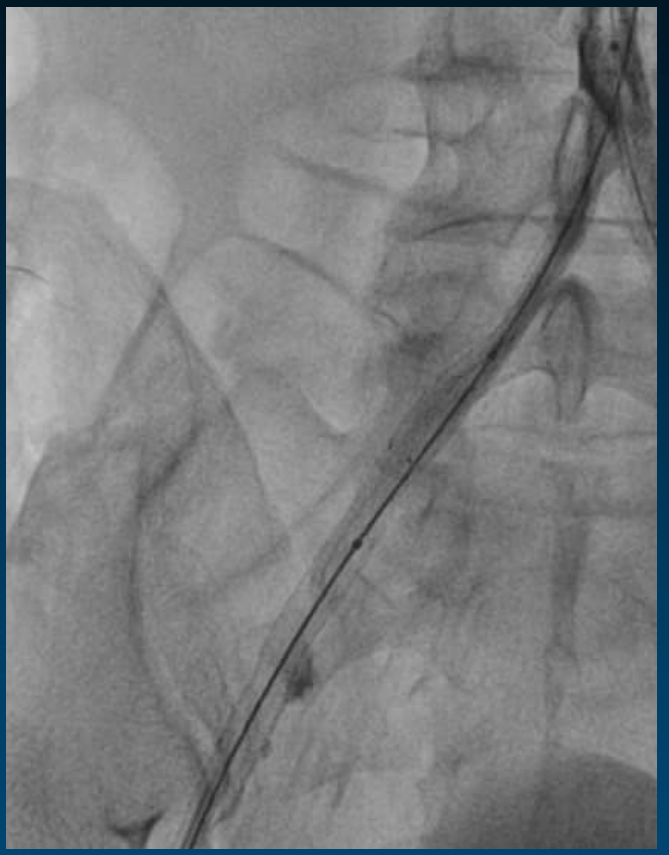


Transradial 5 Fr shuttle
Transfemoral 7 Fr long sheath

SAFARI (CART)
antegrade wire externalization

M/65, HTN, Lung ca op
Both Fontaine IIb claudication, ABI 0.52/0.57

Kissing with two 7.0x40mm



Kissing with SE Smart
Right; 9.0x80 mm & 7.0x100 mm
Left; 10.0x80mm

Right EIA Rupture

8 Fr sheath required for graft stenting
→ bleeding will continue while exchanging sheath

Transradial proximal occlusion during sheath exchange

S&G graft, 8.0x70 mm

Transradial Approach

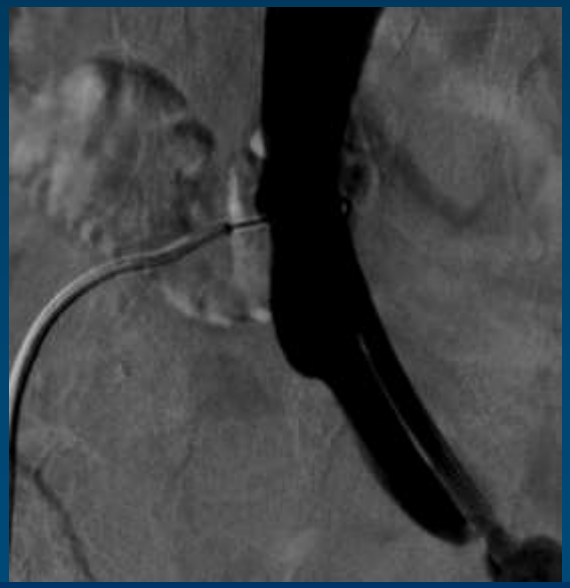
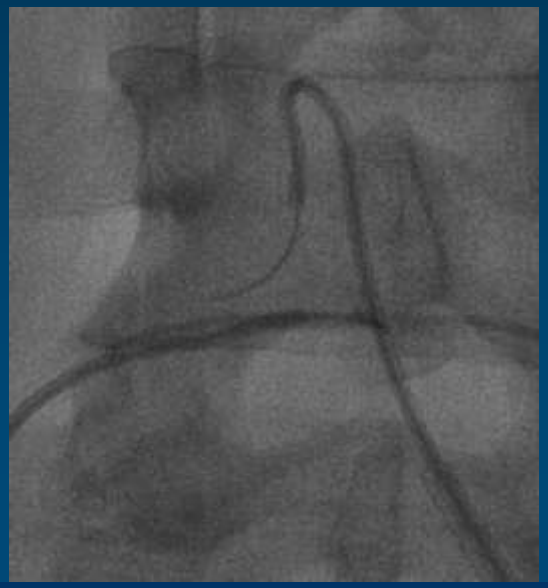
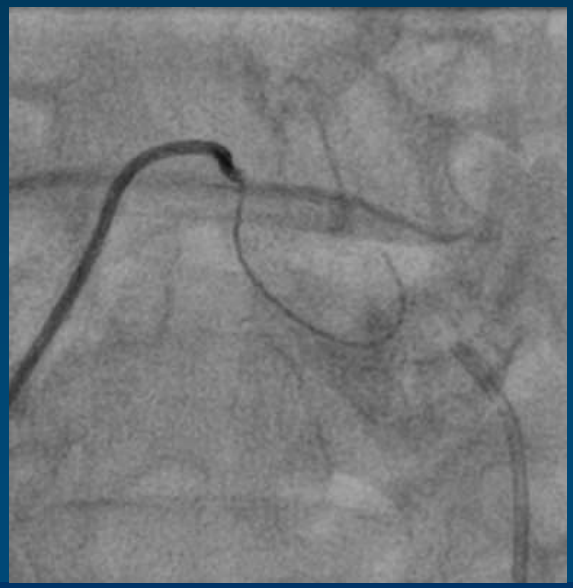
for Aortoiliac CTO

Conventional routes for iliac CTO

Drawback

Both femoral approach for iliac CTO

- More bleeding complication
- Less back up support, especially
  - stumpless CTO or hostile aortoiliac angle
- Difficult for angulated or calcified iliac arteries
- Hemostasis → perfusion disturbance or thrombosis

Drawback

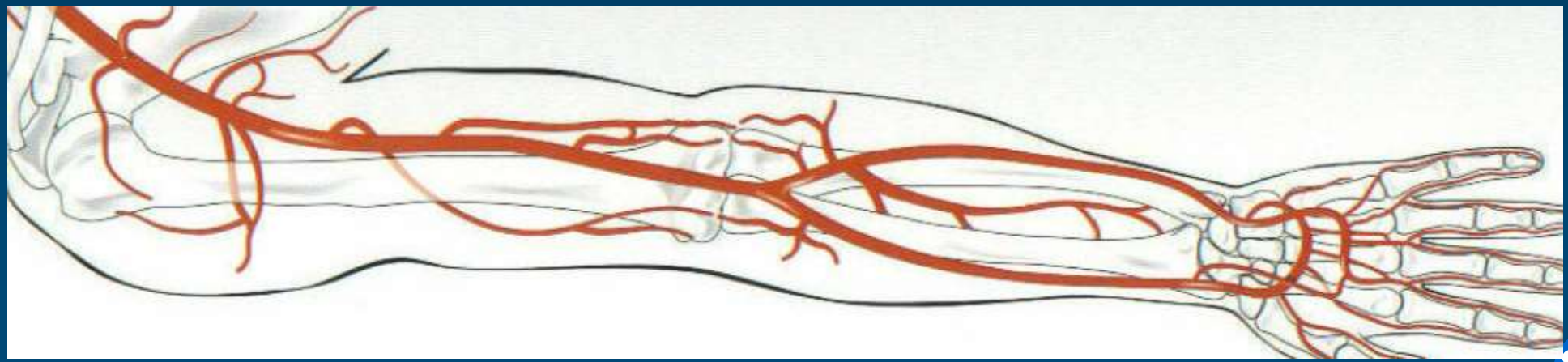
Brachial approach for iliac CTO

- **Single route for hand**

  → potentially lethal ischemic complication

- **Difficult for hemostasis**

  → more bleeding complication



Pros & Cons

Transradial approach for iliac CTO

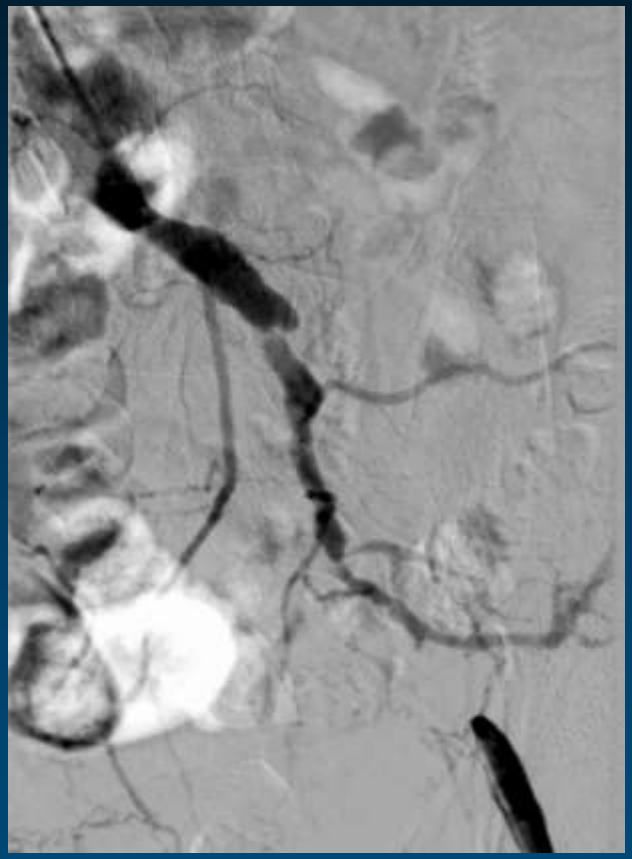
- **Disadvantages**
  - **Smaller arterial caliver → smaller sheath**
  - **Too long to reach**
  - **Subclavian or aortic tortuosity**
  - **More radiation hazard to operator**
- **Advantages**
  - **Less bleeding complication**
  - **Longer and slender devices available**
  - **Powerful perpendicular back up support**

Advance of TR approach for iliac CTO

- **Longer and slender devices**
  - **Sheath; 110 long long shuttle, 5 Fr**
  - **Catheter; 125 cm head hunter, 5 Fr**
    150 cm MP, 5 Fr
  - **Microcatheter; 150 length**
  - **Guidewire; 0.035” Terumo / 0.014” GW**



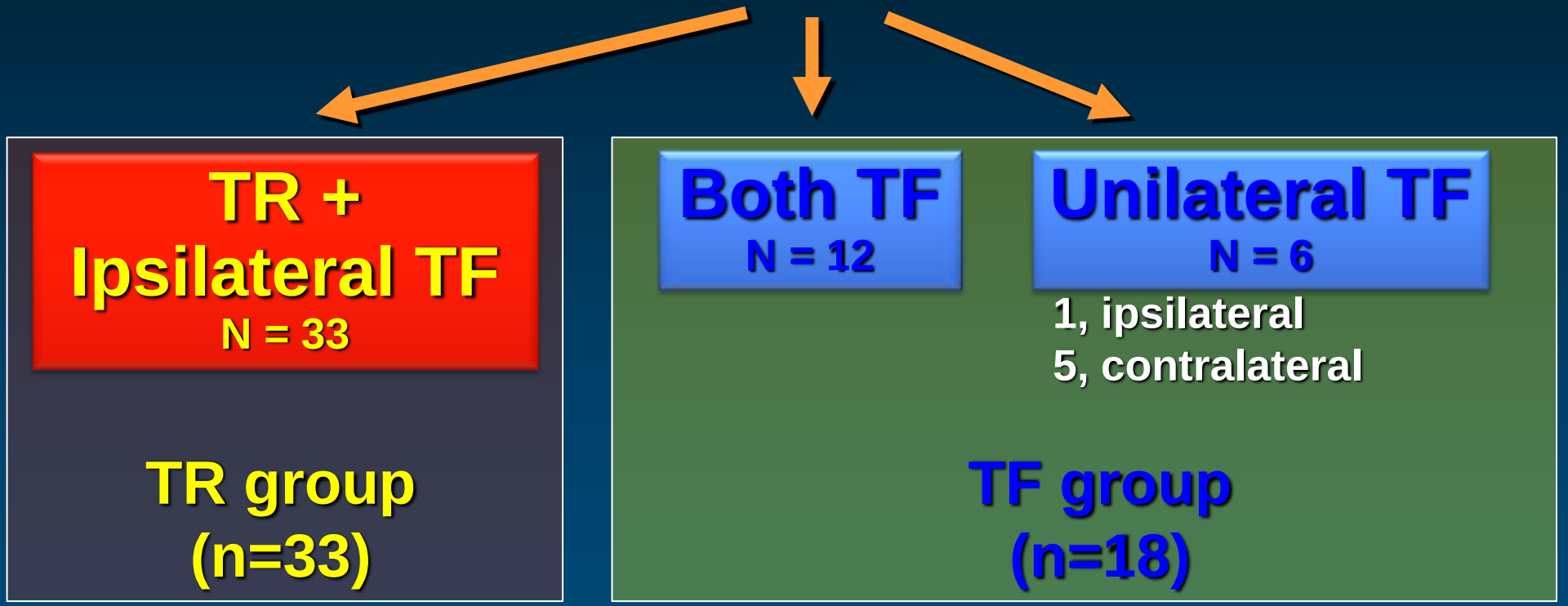
Transradial approach for iliac CTO



TR 5 Fr with 125cm MP
TF 7 Fr long sheath

SAFARI (CART)
Antegrade wire externalization

Aortoiliac CTO intervention (n=51 lesions)



Complete procedural and clinical data at 1 month

Baseline Clinical Characteristics

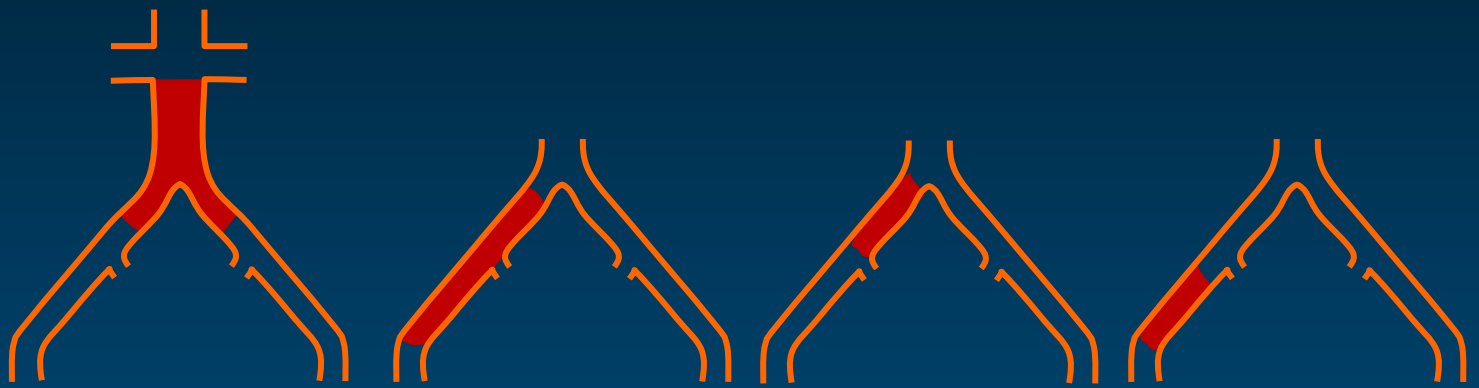
	TR (n=33)	TF (n=18)	*P-value*
Male	31 (94%)	17 (94%)	0.94
Age	68±9	67±9	0.66
DM	16 (49%)	8 (44%)	0.78
HTN	17 (51%)	11 (61%)	0.51
H/O Smoking	22 (77%)	14 (82%)	0.79
Dyslipidemia	16 (48%)	11 (61%)	0.39
S-Cr >2.0mg/dL	1 (3%)	2 (11%)	0.14
Atrial fibrillation	3 (9%)	0	0.19

Rutherford Category

	TR (n=33)	TF (n=18)	*P-value*
1	2 (6%)	1 (6%)	
2	3 (24%)	1 (6%)	
3	24 (75%)	8 (47%)	
4	1 (3%)	3 (17%)	
5	2 (6%)	3 (17%)	
6	0	1 (6%)	
CLI	3 (9%)	7 (40%)	0.009

CTO Location

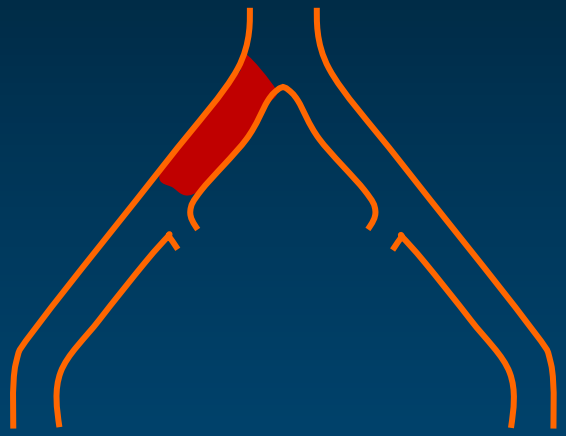
TR group (n=33)	4(12%)	7(21%)	16(49%)	6(18%)
TF group (n=18)	0	3 (17%)	6(34%)	9(49%)



CIA Ostial Stump <5 mm

TR group (n=33)

12(36%)



P=0.03

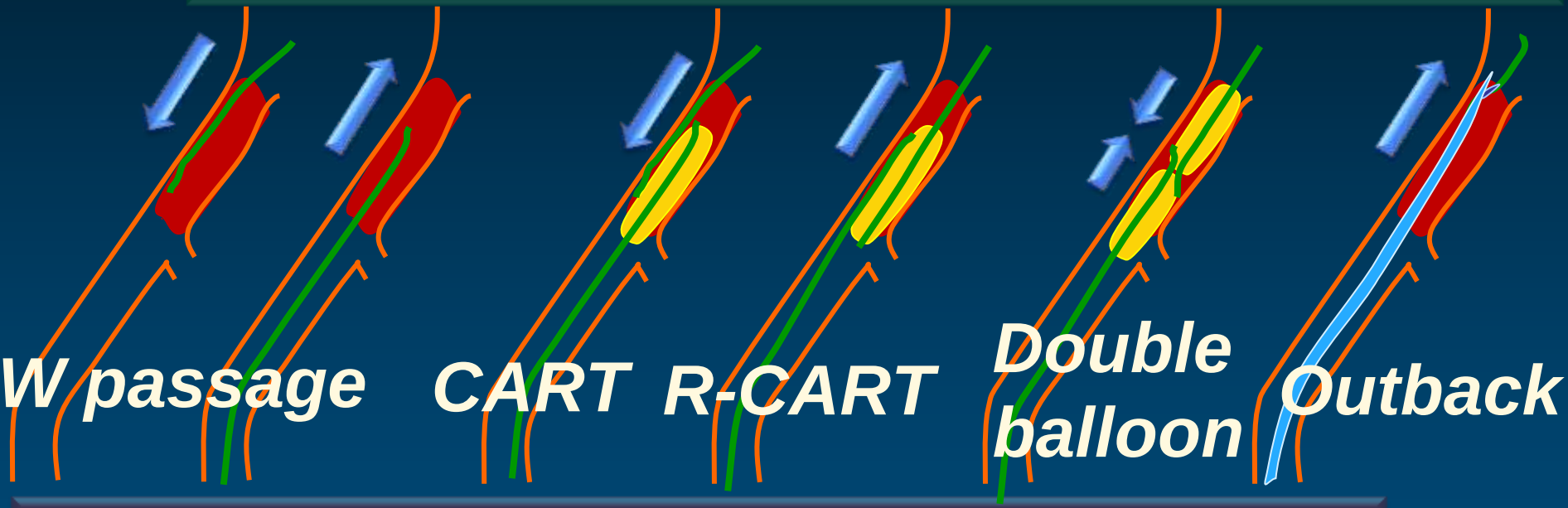
TF group (n=18)

1 (6%)

Techniques for GW Passage

TR group (n=33)

GW passage	CART	R-CART	Double balloon	Outback
16(49%)	14(42%)	0	1(3%)	2(6%)



GW passage	CART	R-CART	Double balloon	Outback
14(78%)	2(11%)	1(6%)	1(6%)	0

TF group (n=18)

Procedural result

	TR (n=33)	TF (n=18)
Procedural success	100%	100%
Access route change	1 (3%)	0
Iliac perforation*	2 (6%)	1 (6%)
Distal embolization	0	1 (6%)
Puncture site bleeding#	0	1 (6%)
Admission duration, days	6±12	10±15
1-month mortality	0	0

**** One of each group treated with graft stent implantation***

 # Surgery required retroperitoneal bleeding

Transradial aortoiliac CTO intervention

Advantages

- Less bleeding complication
- Higher success rate
- Does not increase procedural time
- Longer and slender devices available
- Powerful perpendicular back up support for stumpless iliac CTO or hostile aortoiliac angle
- Rapid return to life

Conclusion

For Successful Iliac CTO Intervention

- **Appropriate site of access according to CTO location and morphology is considered.**
  → Transradial is a good route for proximal approach
- **Bidirectional approach such as SAFARI technique is essential technique to avoid dissection beyond CTO segment.**
- **To reduce rupture risk (CTO, Calcification, Bigger device, High pressure …):**
  → Smaller stent is safer and graft stents should be prepared at any time