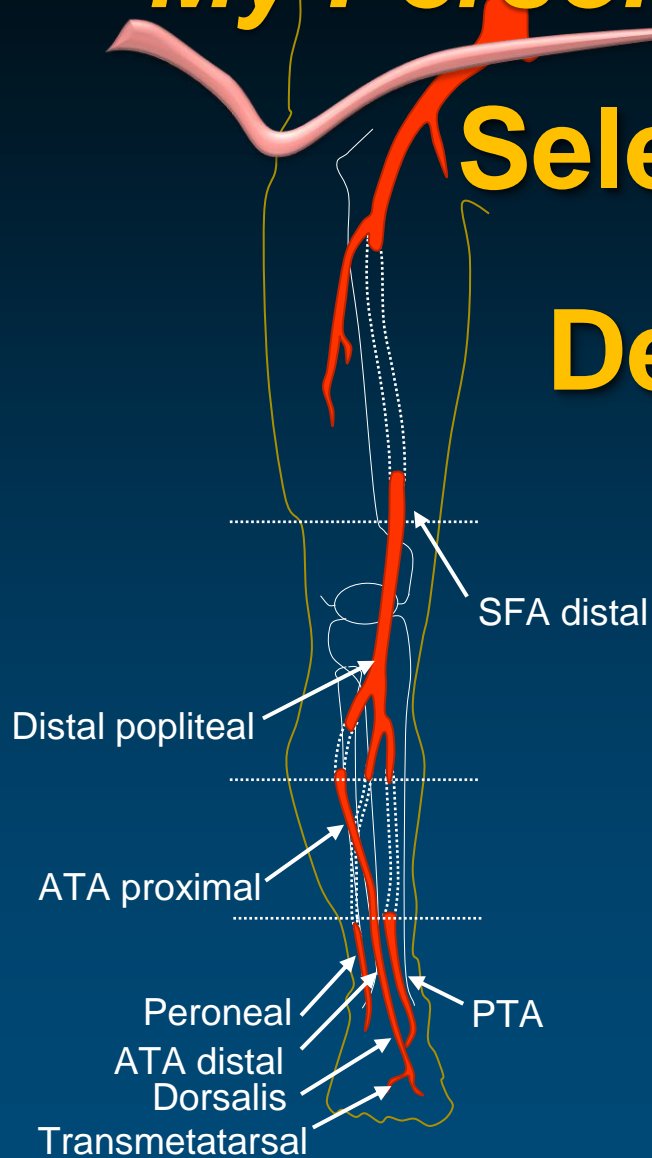


My Personal

Selection of GWs and Supporting Devices for BTK Interventions



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**Cardiovascular Center in
Chungnam National University Sejong Hospital**

Overcoming Coronary BU CTO → BTK Ca⁺⁺ / CTO

Augumented guide support

Transfemoral > Transradial
Bigger sheath, EBU / AL > Judkins
Mother-child technique using a
Guidezilla / Guideliner
Anchor wire/ Buddy wire
Anchor balloon ...

Lesion Modification

Microcatheter (New or Exchange...)
Balloon assisted microdissection (BAM)
with intentional balloon rupture
Rotablation

Retrograde Approach

BU CTO = Balloon uncrossable CTO

Augumented guide support

Ipsilateral approach > Contralateral
Bigger sheath, 5 Fr → 6 Fr
Mother-child technique using a
Guidezilla / Guideliner
Anchor wire/Buddy wire/Anchor balloon

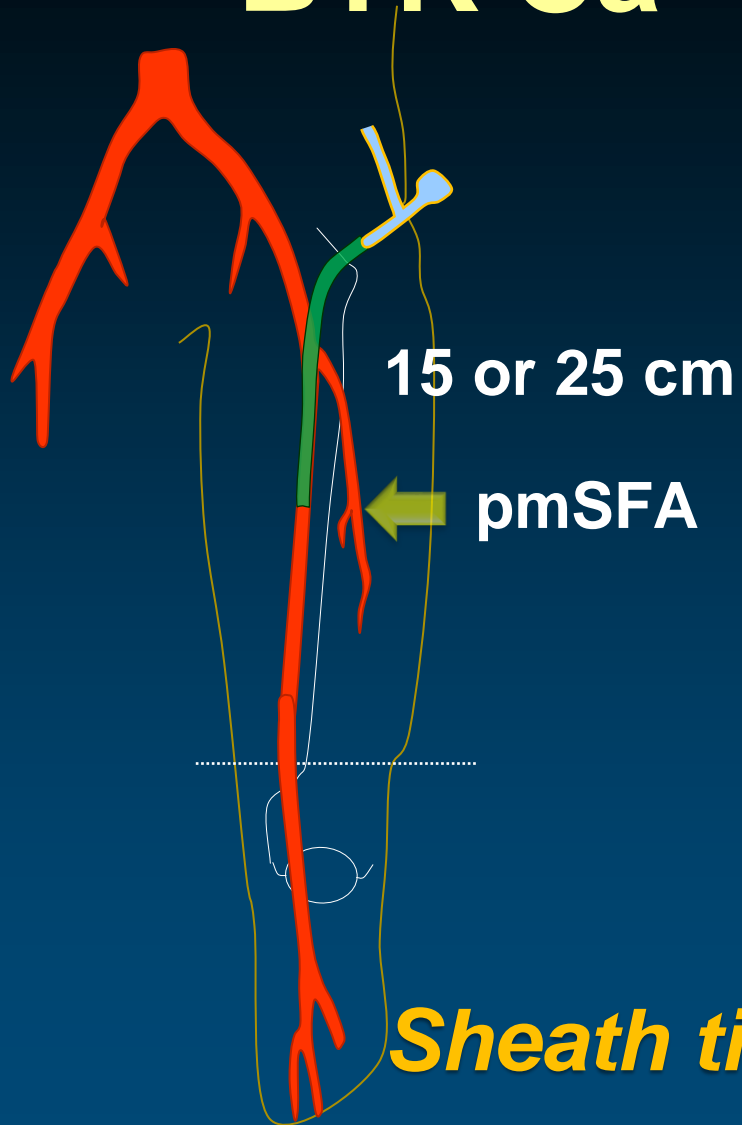
Lesion Modification

Microcatheter (New or Exchange...)
Balloon assisted microdissection (**BAM**)
with intentional balloon rupture
Rotablation / **External piercing**

Retrograde Approach

Transpedal or Pedal loop access
BADFARM technique

BTK Ca⁺⁺/CTO - Length of Sheath



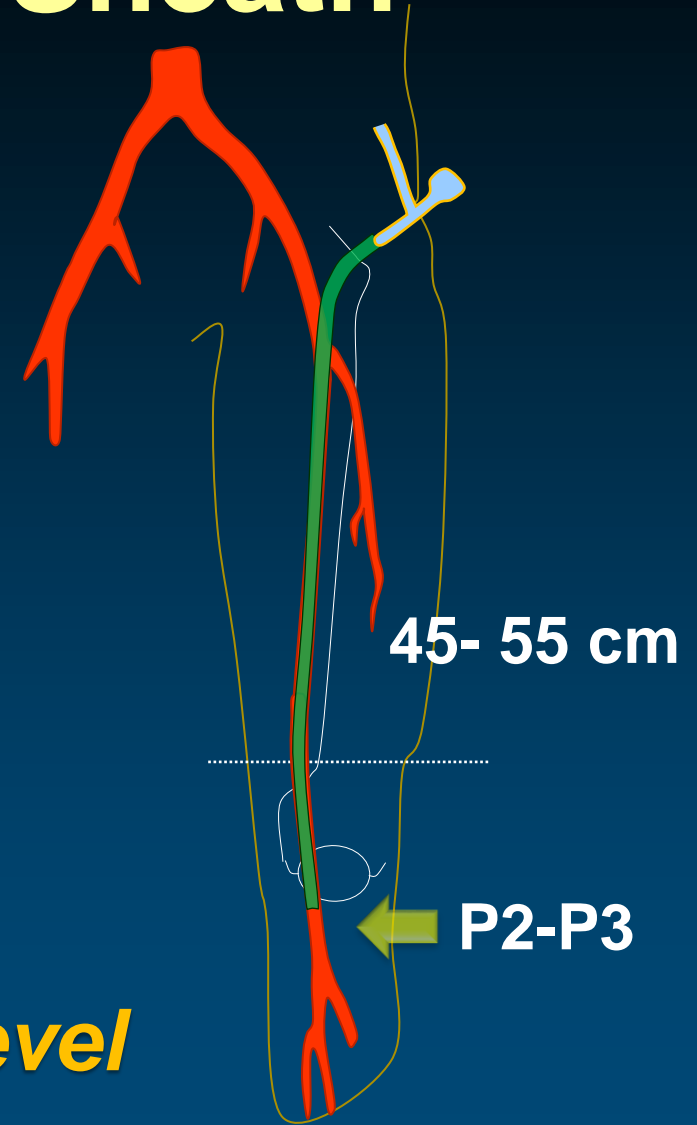
Contrast needed

Image quality

Radiation hazard

Support power

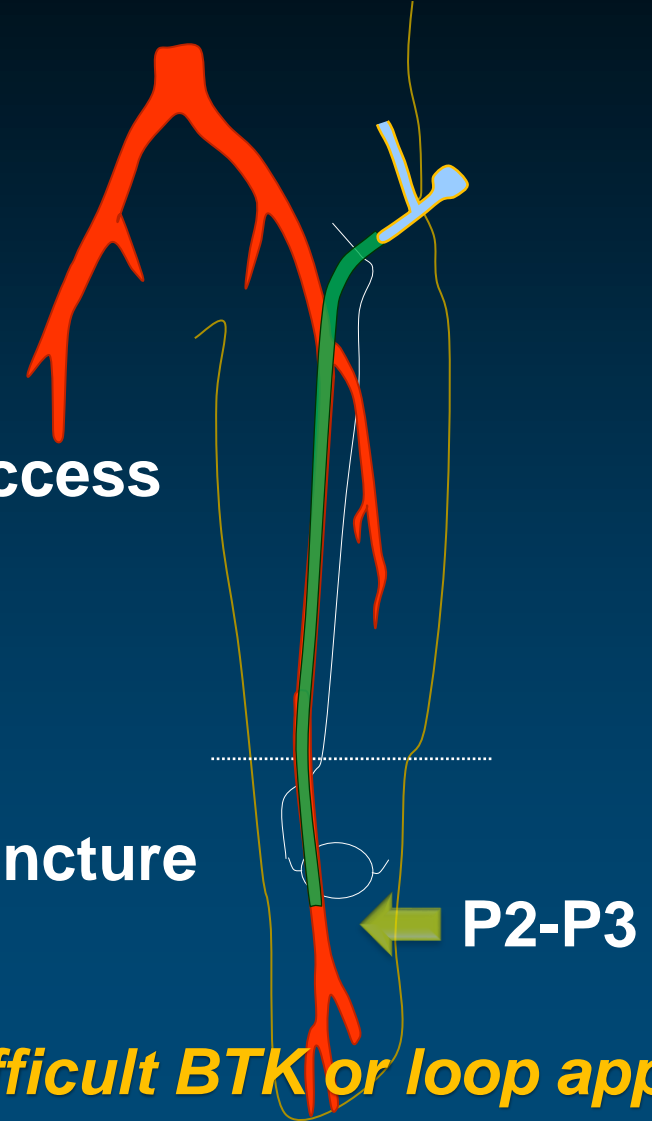
Thrombus aspiration



Sheath tip should reach P2-P3 level

Ipsilateral Antegrade Approach

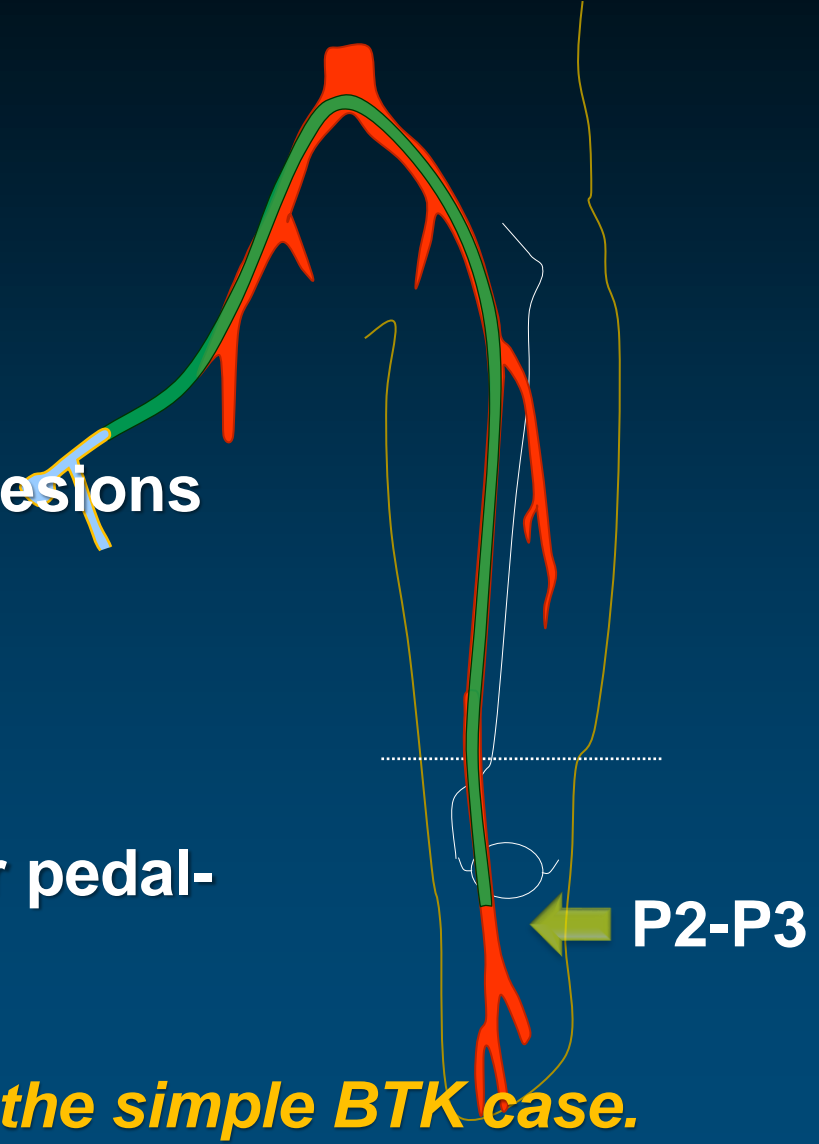
- 45-55 cm sheath → P2-3 landing
eg) Ansel, Fortress ...
- Sheath diameter selection
 - 5 Fr – Simple BTK lesion
 - 6 Fr – SFA+BTK lesions, Pedal-plantar loop access
 - 7 Fr – FP atherectomy
- 150 cm MC or 145 cm OTW balloon
for pedal-plantar loop access
- Micropuncture set is recommended for safe puncture
 - Fluoroscopy or USG guidance



Ipsilateral antegrade access is the usual route for difficult BTK or loop approach

Contralateral Femoral Approach

- 80-90 cm sheath → P2-3 landing
eg) Shuttle, Fortress ...
- Sheath diameter selection
 - 5 Fr – Simple BTK lesion
 - 6 Fr – SFA+BTK lesions, Complex BTK lesions
 - 7 Fr – Iliac lesion or FP atherectomy
- 150 cm MC or 145 cm OTW balloon
reaches the tip of pedal arteries but,
- Additional antegrade route is required for pedal-planter loop technique



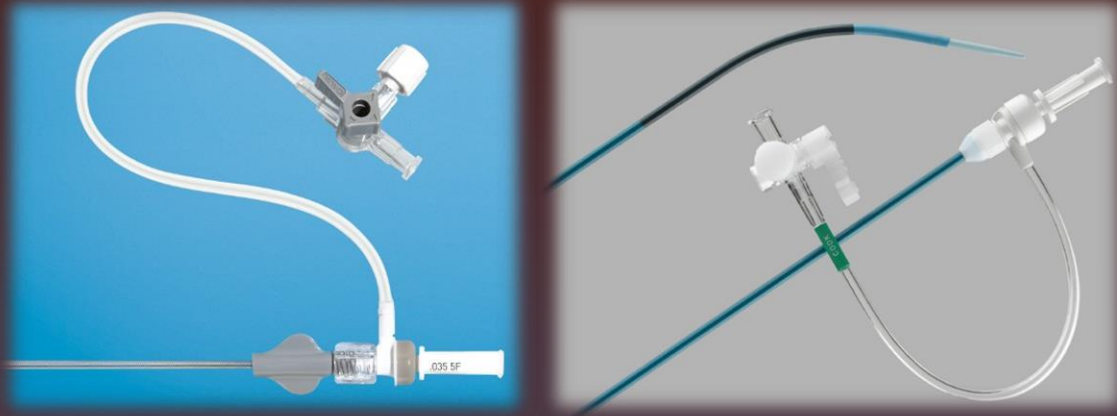
Contralateral access can be applied to the simple BTK case.

Access Routes for BTK CLI Intervention

	Contralateral femoral	Ipsilateral antegrade
Pros	<p>Simultaneous evaluation of coronary & aortoiliac → can treat IHD and aortoiliac together Easier puncture Less bleeding Complications</p>	<p>Better back-up support Better GW and device control Pedal-planter loop access can be conveniently performed</p>
Cons	<p>Poor back-up support GW manipulation is not easy Additional route is required for pedal-planter loop access</p>	<p>Difficult puncture in case with significant CFA or pSFA disease More bleeding complications - especially for obese patient</p>
Usage	<p>First procedure requiring coronary & aortoiliac evaluation BTK lesion with less difficulty</p>	<p>≥ 2nd session with known coronary status More complex BTK lesion - calcified, thrombus-filled - requiring atherectomy - needs pedal-loop access</p>

Hemostatic Valve for Sheath

Premounted hemostatic valve



- Removable or fixed design
- Simple for use

Tuohy Borst Y connector



- ‘Lock-Open’ feature
 - max. 10 Fr inner diameter
 - minimize blood loss during procedure
 - easier removal of air and clot
 - easier retrograde wire externalization

Guidewire Tip for Pedal-Plantar Loop

Usual shape



Wire for pedal loop



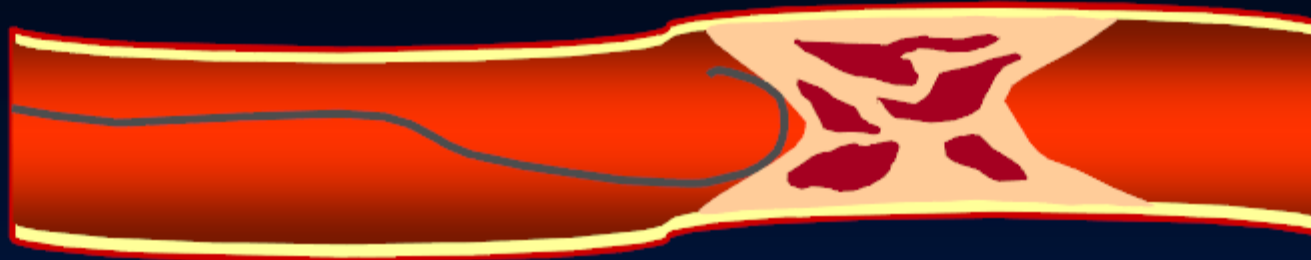
2nd bend



Microcatheter

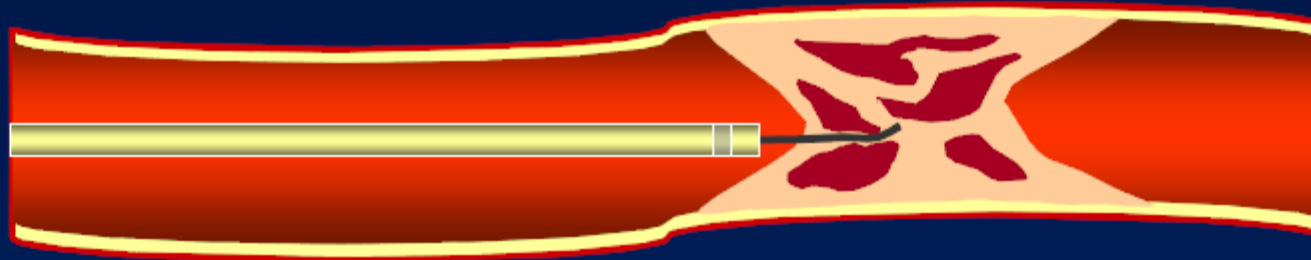
Microcatheter back-up is mandatory

Wire only



The tip of the guidewire often curves back at the proximal fibrous cap due to poor backup support.

Wire with Micro-catheter



Micro-catheter reinforces torque transmission of guidewire and creates better backup support for penetration of the complex lesion.

Microcatheter back-up is mandatory

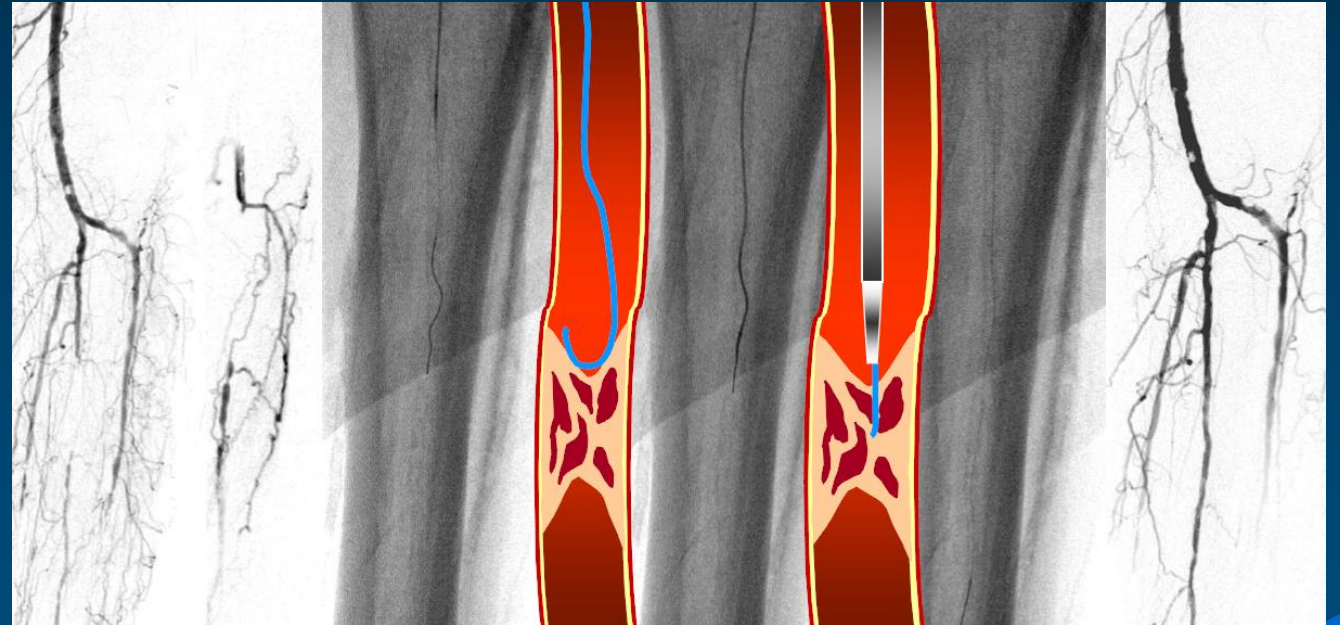
- For rapid wire exchange, wire reshaping, or superselective angiography
- Increase GW tip load
- **I prefer to use 0.014" compatible system for BTK**
 - better tracking for angulated pedal loop
- **1.2-1.5 x 20mm Armada XT OTW balloon**
or 150 cm long CXI microcatheter
- 1.2~1.5mm OTW balloon is very helpful for
 - balloon anchoring to increase GW power
 - progressive dilatation for calcified lesion (BAM)

My GW Selection for BTK/BTA CTO

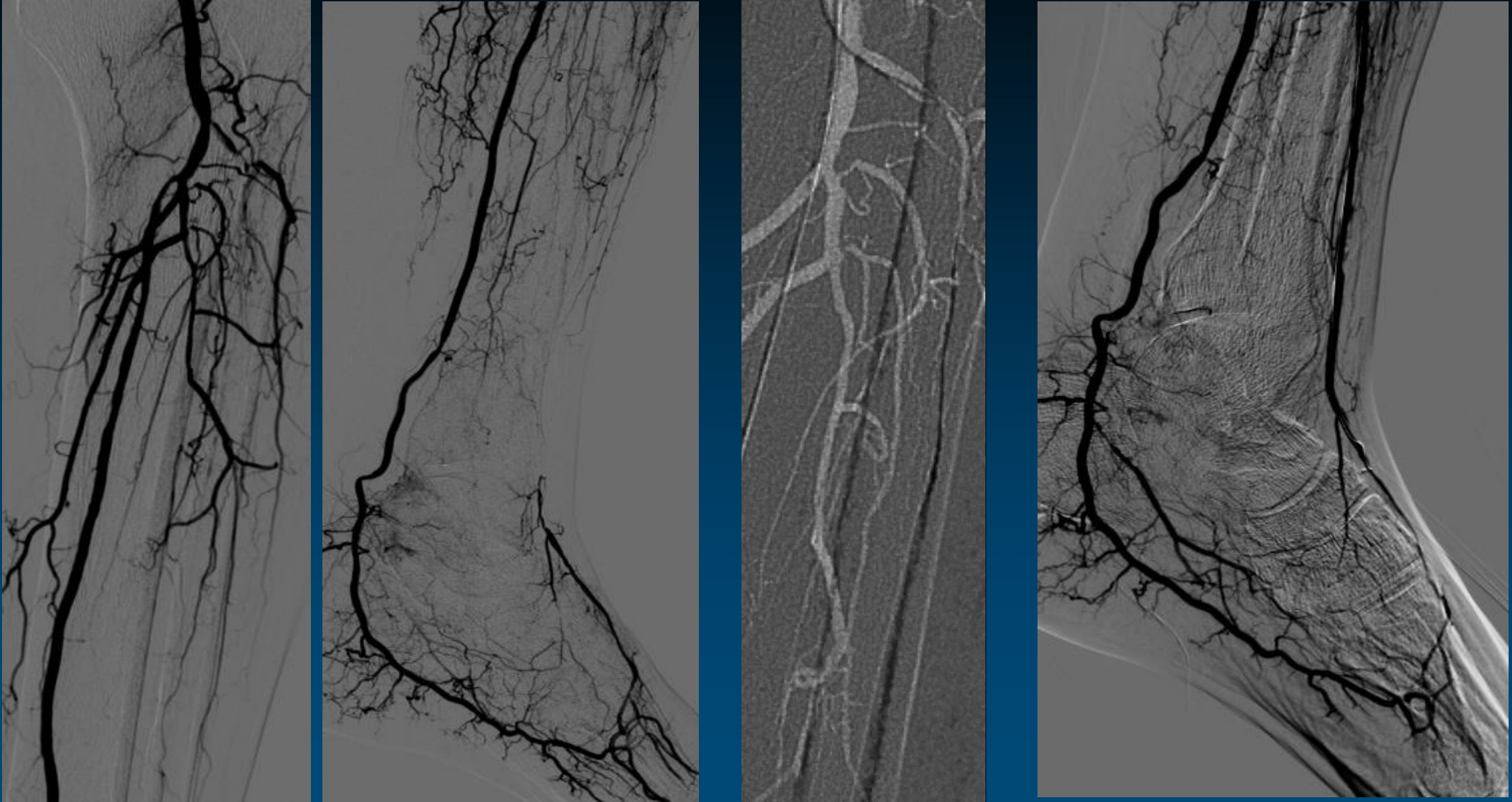
- For initial step for antegrade intraluminal approach
 - Hydrophilic polymer jacket GW with superior steerability
; *Gladius (3g) or Regalia XS (1g)*
 - Transient shift to intermediate or stronger one
; for calcified spot
; *Halberd (12g) or Atrato 20 or 30g ...*
- For subintimal or retrograde approach
 - Usually subintimal tracking required for retrograde access
 - *Command ES GW is my default wire*
 - ; Tip breakage-resistant
 - ; Reshaping in-situ w/o microcatheter support
 - ; Better handling for externalization
- For intentional tracking or reentry of flush occlusion
 - *Atrato XS 20g or 40g*

Intraluminal Approach with SSD

- Super Speed Drilling (SSD)
 - Microcatheter backup mandatory
 - ; Armada XT OTW balloon or CXI
 - 0.014" ; Gladius or Regalia is my default GW
 - Rapid GW rotation with torque device
 - Transient GW switch during the course (UB3, Haberd, Astato)



Intraluminal Approach with SSD



Step-by-step approach in CTOs crossing strategy

□ Antegrade approach

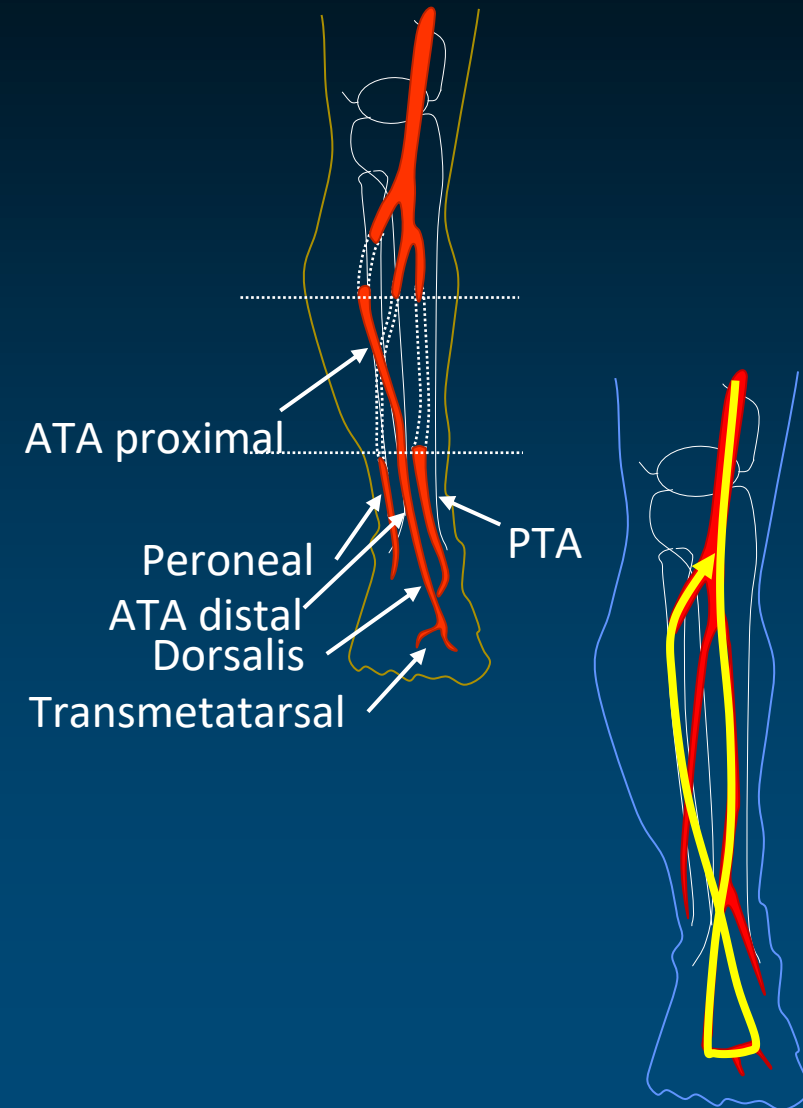
1. Endoluminal
2. Subintimal

Failure

□ Retrograde puncture

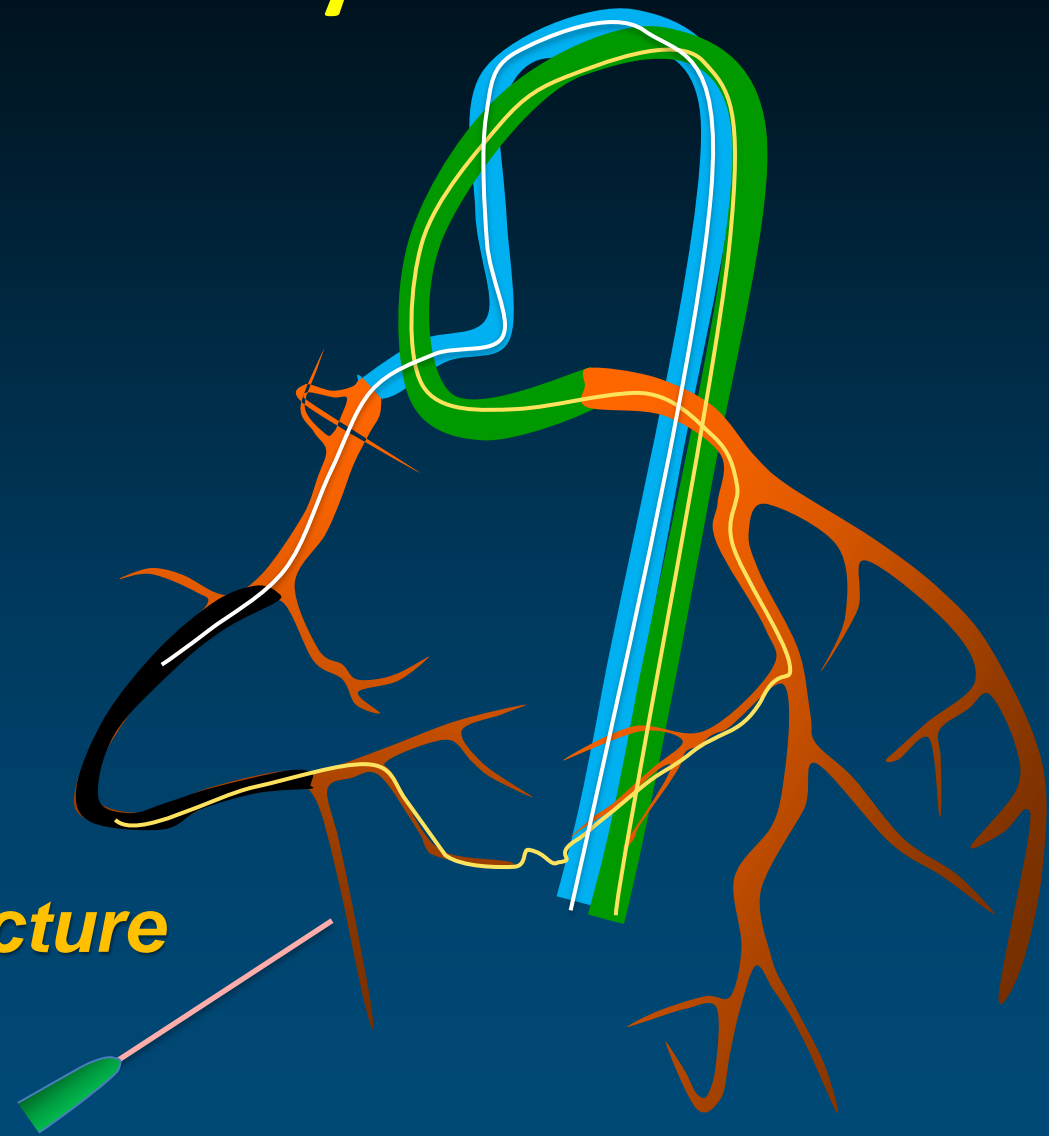
□ Transcollateral

1. Pedal-plantar loop technique
2. Peroneal artery branches PTA

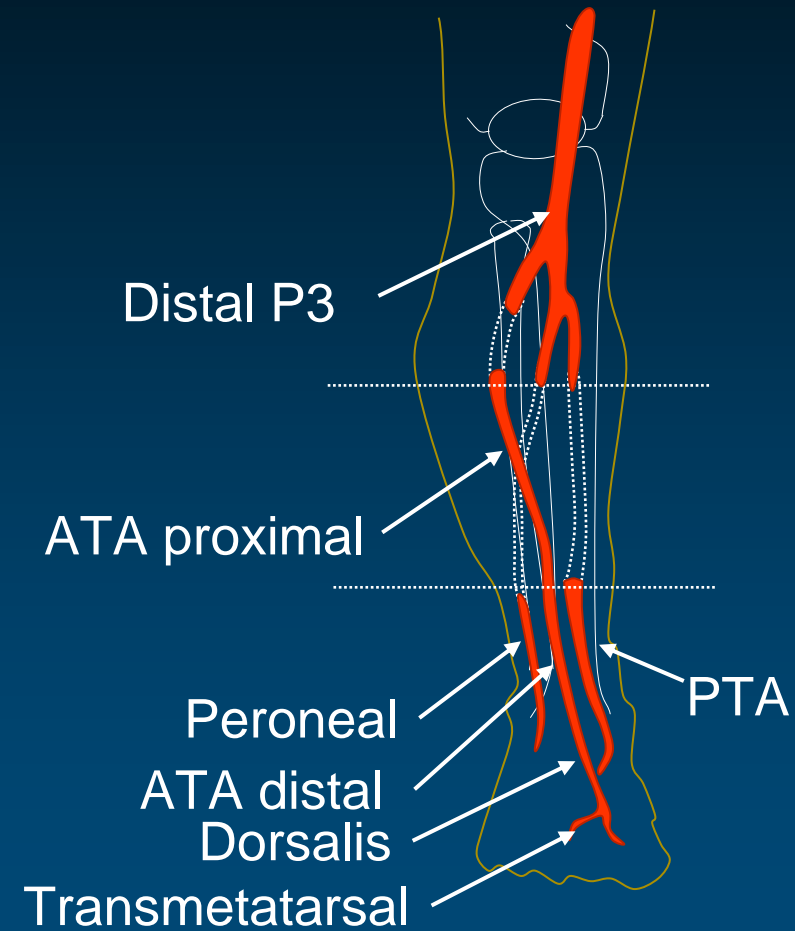
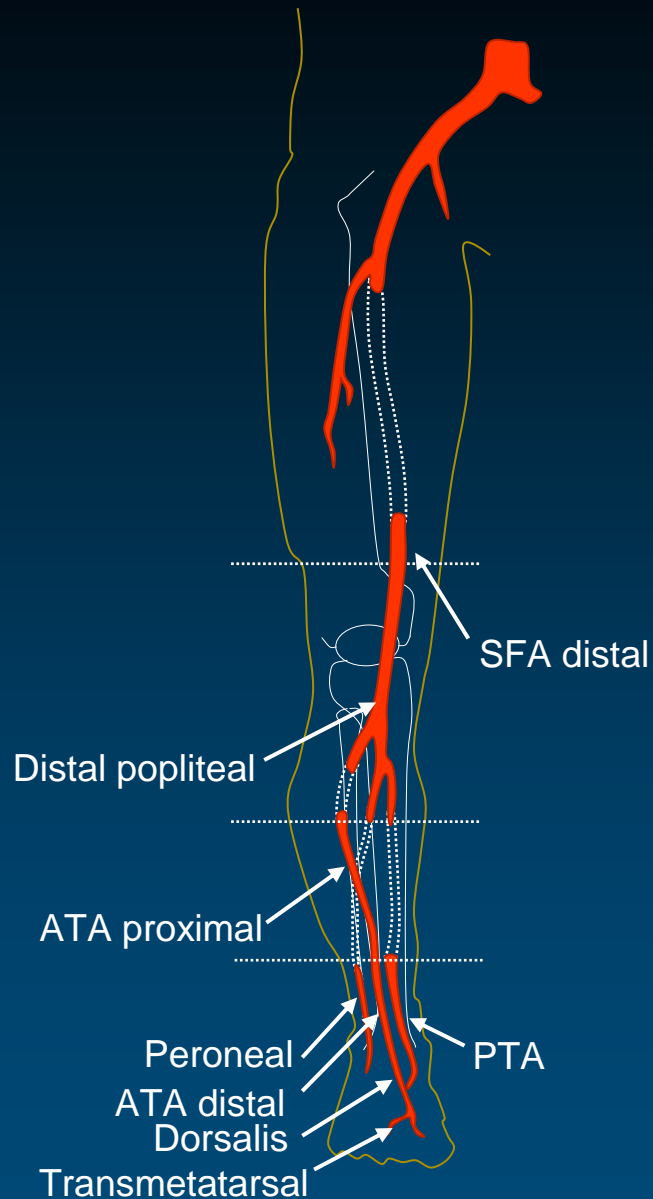


Retrograde Approach for Coronary CTO

Application of direct distal puncture
→ Impossible



Retrograde Puncture in Supine Patient Position

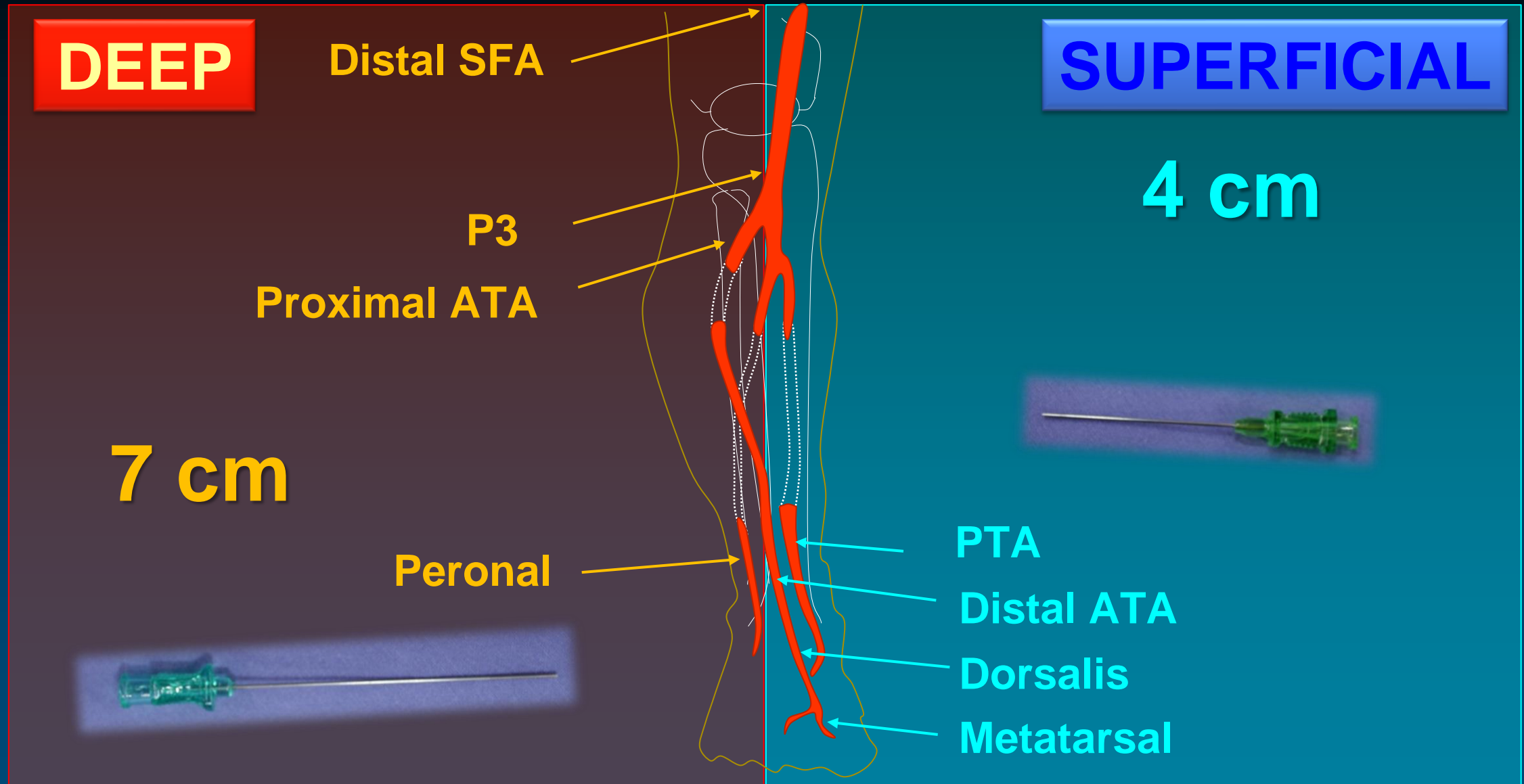


Retrograde Puncture Needle

- 21 G steel needle
- 4 cm or 7 cm



Length of Retro Puncture Needle; 7 cm vs. 4 cm



Retrograde Pedal Access Tools

- Sheathless approach is better
 - 0.014" or 0.018" GW
 - + Coronary OTW balloon or Microcatheter
 - My default system for retrograde access
 - ; Command ES 0.014 GW + 90 cm CXI MC
- 4 Fr Terumo sheath
 - for tough calcified case

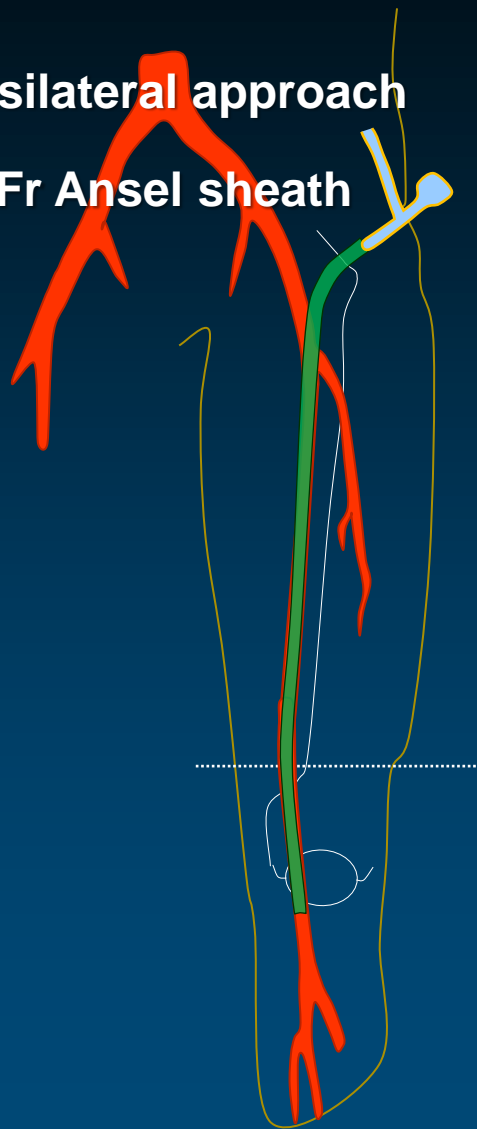


Case Share

Heavily calcified pATA CTO case

Ipsilateral approach

6 Fr Ansel sheath



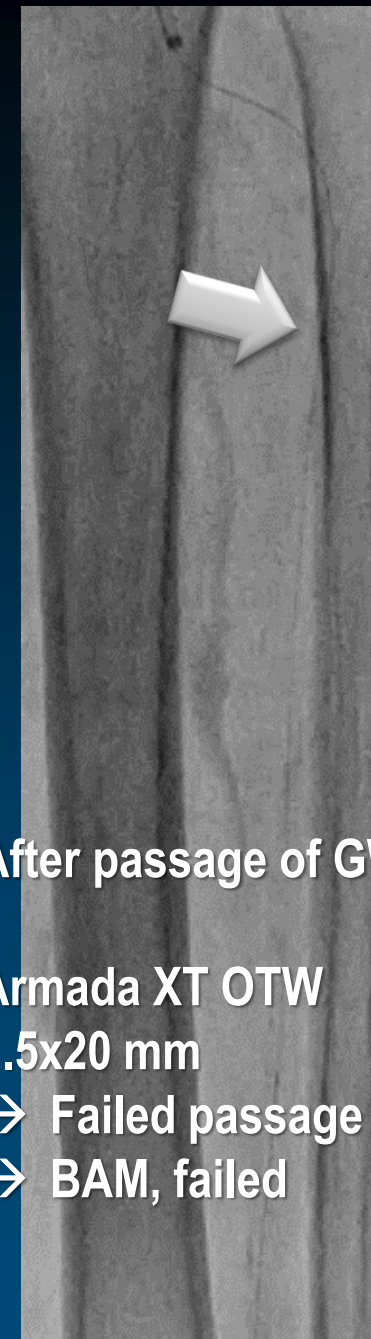
After passage of GW,

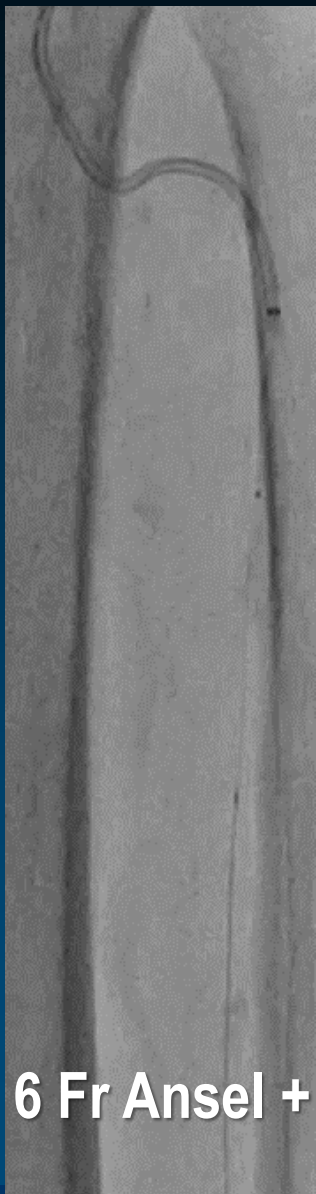
Armada XT OTW

1.5x20 mm

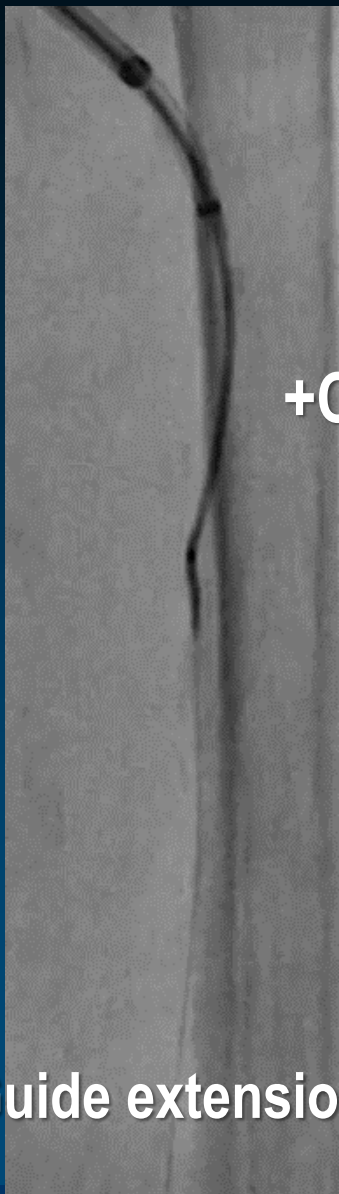
→ Failed passage

→ BAM, failed

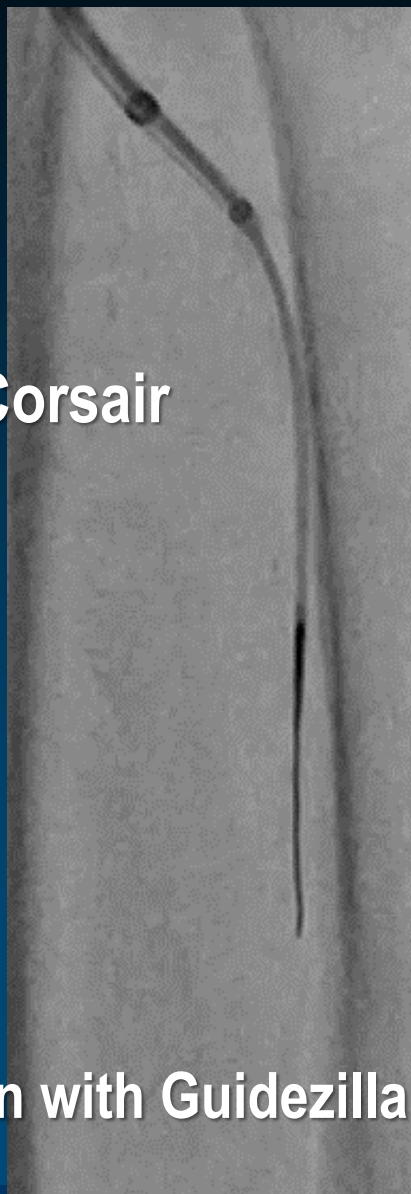




6 Fr Ansel + Guide extension with Guidezilla



+Corsair

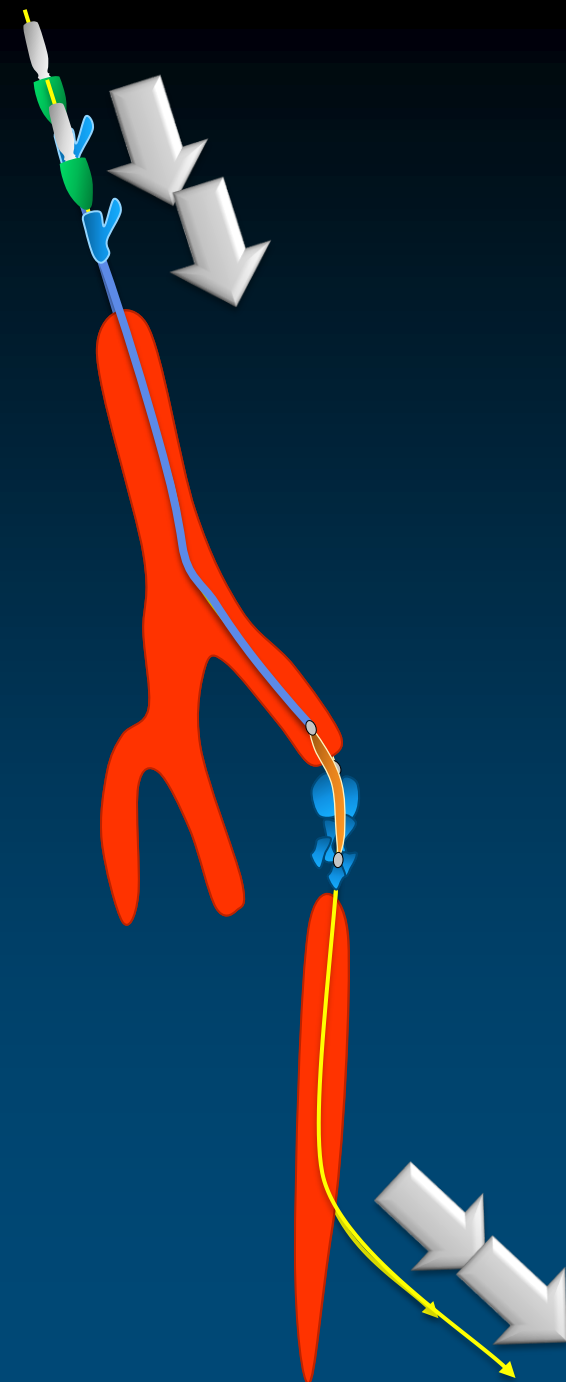


Retrograde dorsalis puncture

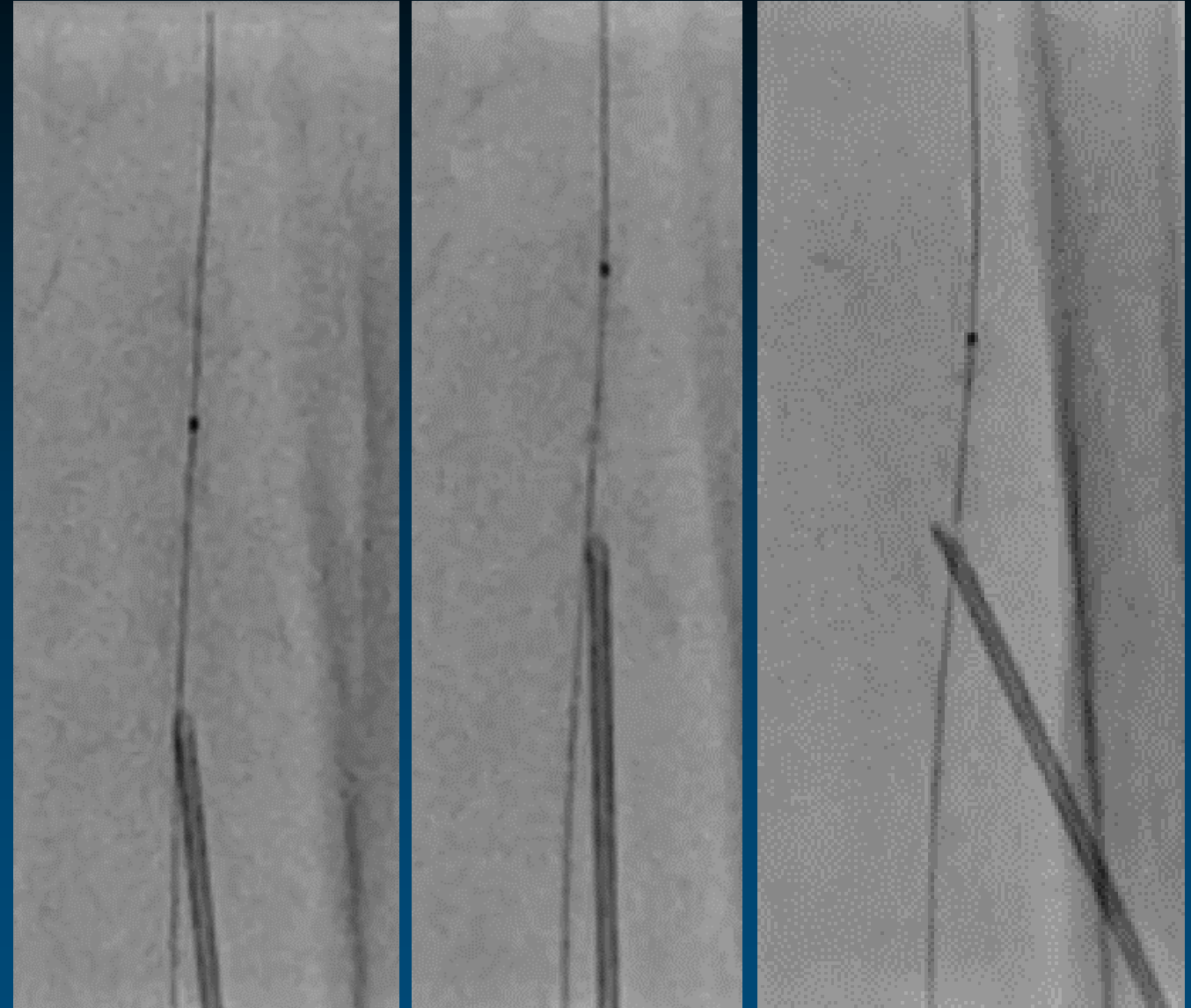
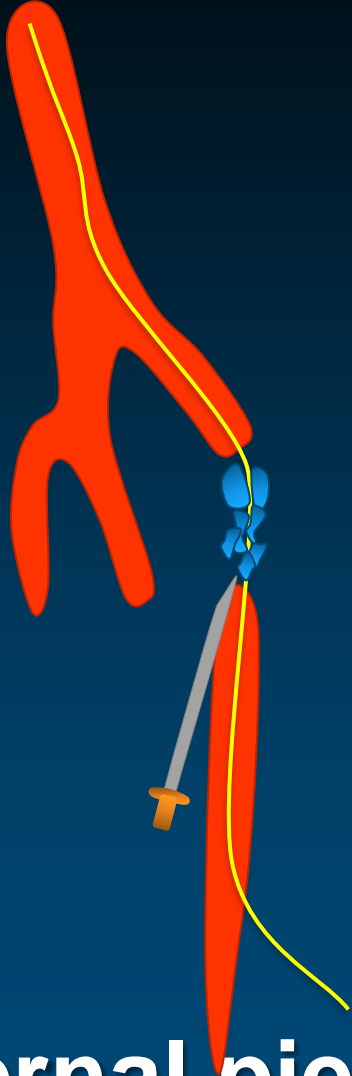
Armada XT OTW
1.5x20 mm
→ Failed passage

Simultaneous advancement of both GW and balloons BADFORM (BALloon Dilatation using a FORcible Manner)

Remove friction between
the wire and the balloon
→ Easier delivery



When all the efforts fail



External piercing

Conclusion

Selection of GWs and supporting devices for BTK interventions

- Delivery sheath selection
 - Access route and diameter selection
; depends on the lesion complexity and the procedural plan
 - **Must arrive at P2-3 level**
- MC and GW selection
 - Appropriate use of 0.014 inches GWs
 - OTW balloon or MC support is mandatory for CTO
- Guide extension, Piercing, BADFORM, Rotablation...
 - Sometimes required
- **Apply retrograde pedal access or pedal-plantar loop access freely**