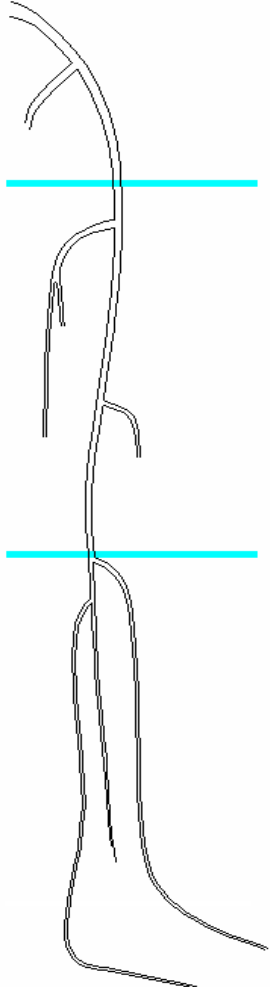


# Retrograde Approach with Pedal Puncture



**GB Danzi , MD**  
**Milan - Italy**

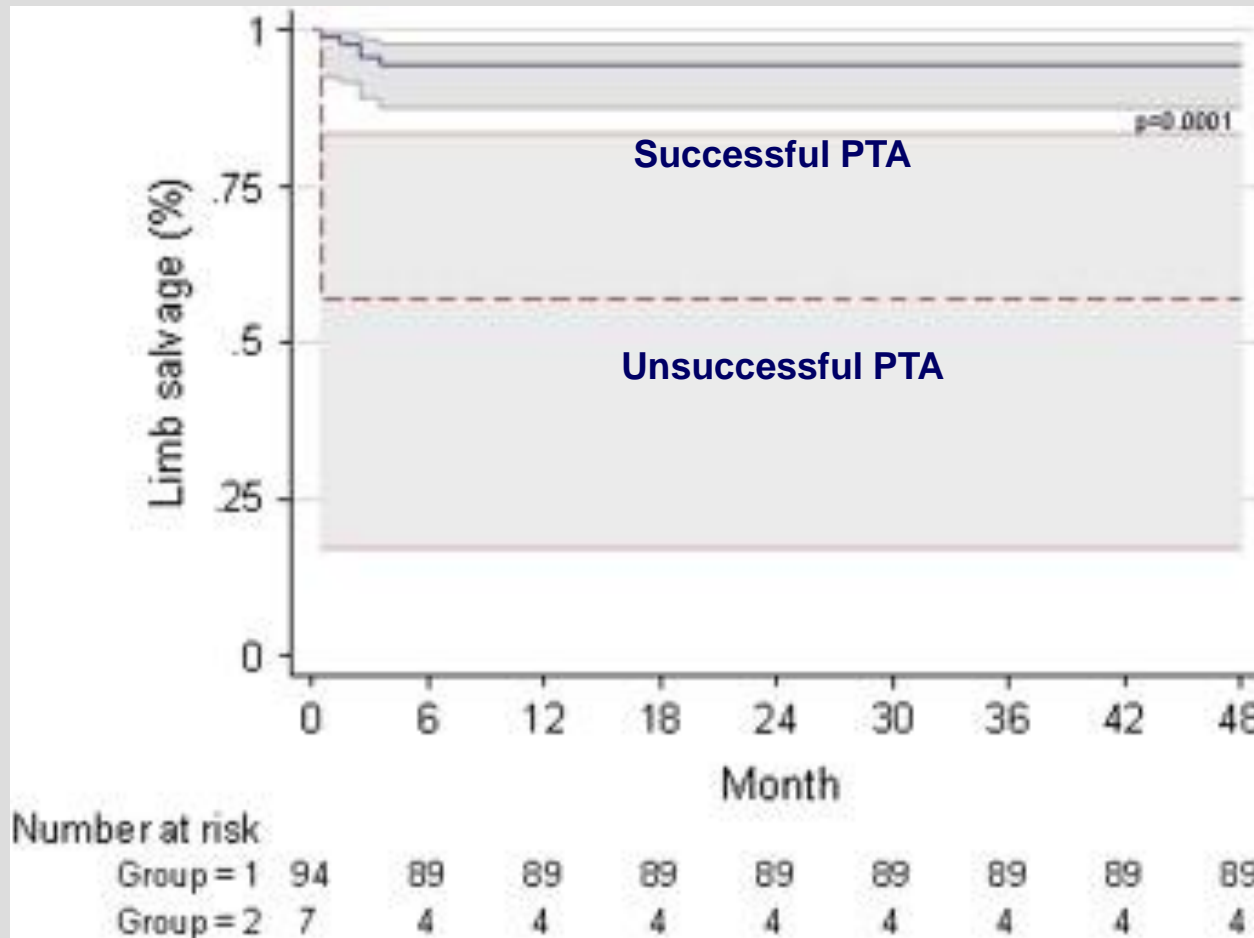
# Attempted CTO lesions in BTK Interventions in 774 pts



<b>3/51</b>	<b>6 %</b>
<b>246/621</b>	<b>40 %</b>
<b>278/836</b>	<b>33 %</b>

# Successful vs Unsuccessful PTA for BTK

## Limb Salvage at 2 Year

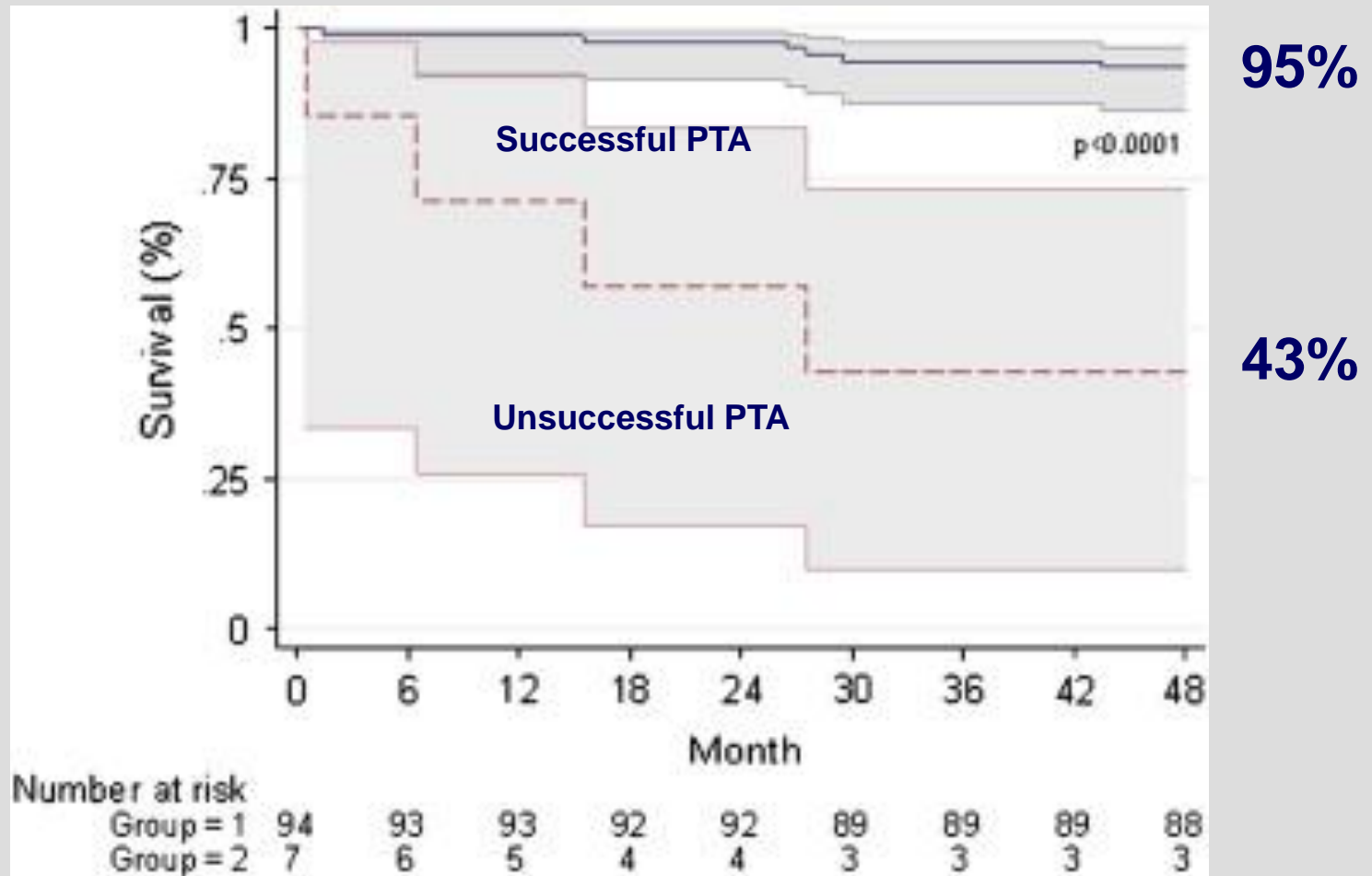


**95%**

**57%**

# Successful vs Unsuccessful PTA for BTK

## Survival Rate at 2 Years



# CTO crossing strategies

## Antegrade approach

1. Endoluminal
2. Subintimal

## Transcollateral

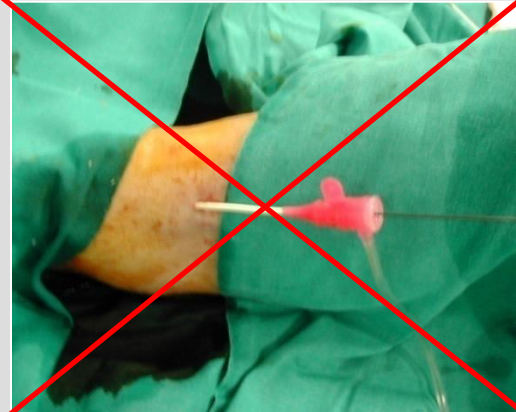
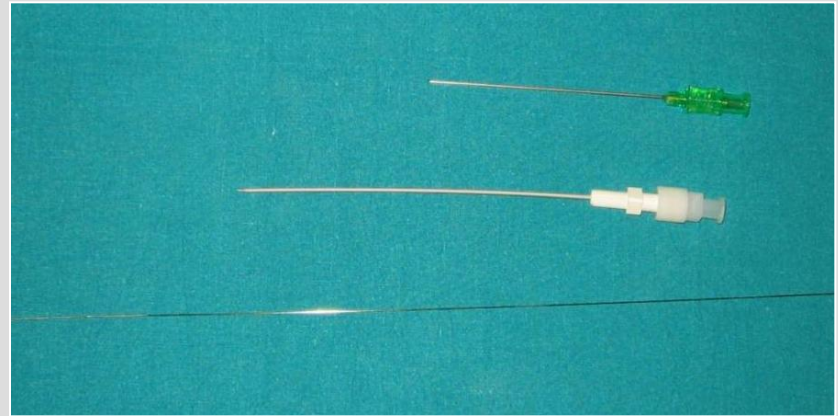
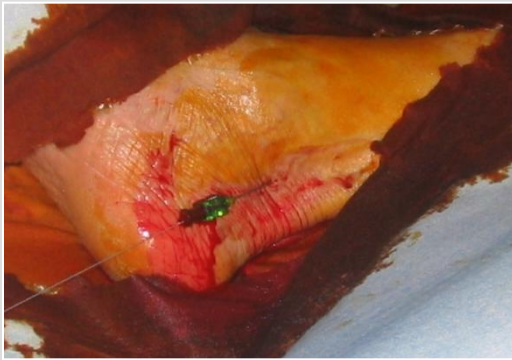
## Retrograde puncture



*No true  
distal  
lumen?*

# The technique

## *Retrograde (Double) approach*



1. 20 G radial needle
2. 21 G needle 0.018-inch GW
3. avoid introducer
4. PT2 wire
5. Coronary CTO wires

# The technique

---

**US-guided puncture**

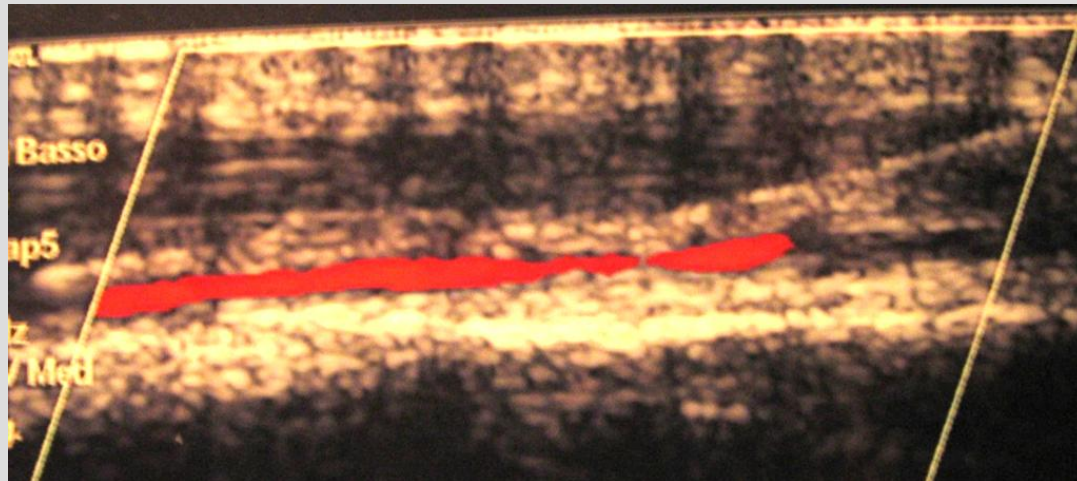


**Non calcified arteries**

**“Fluoroscopic”- US Doppler  
Puncture**



**Highly calcified arteries**



# Retrograde (double) approach

- Proximal access in SFA (CFA)
- Distal access:
  - pedal artery → ATA
  - retromalleolar artery → PTA
- 20 gauge needle puncture
- No introducer, wire + low profile OTW balloon
- Snare kit to capture wire in SFA



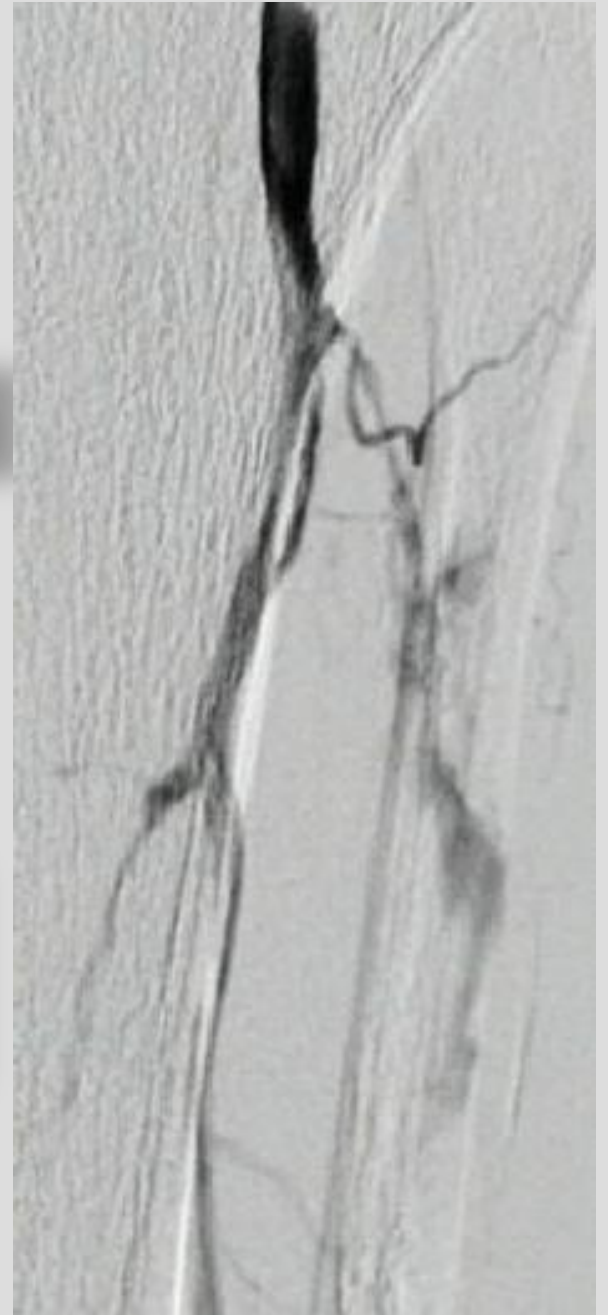
# CASE 1



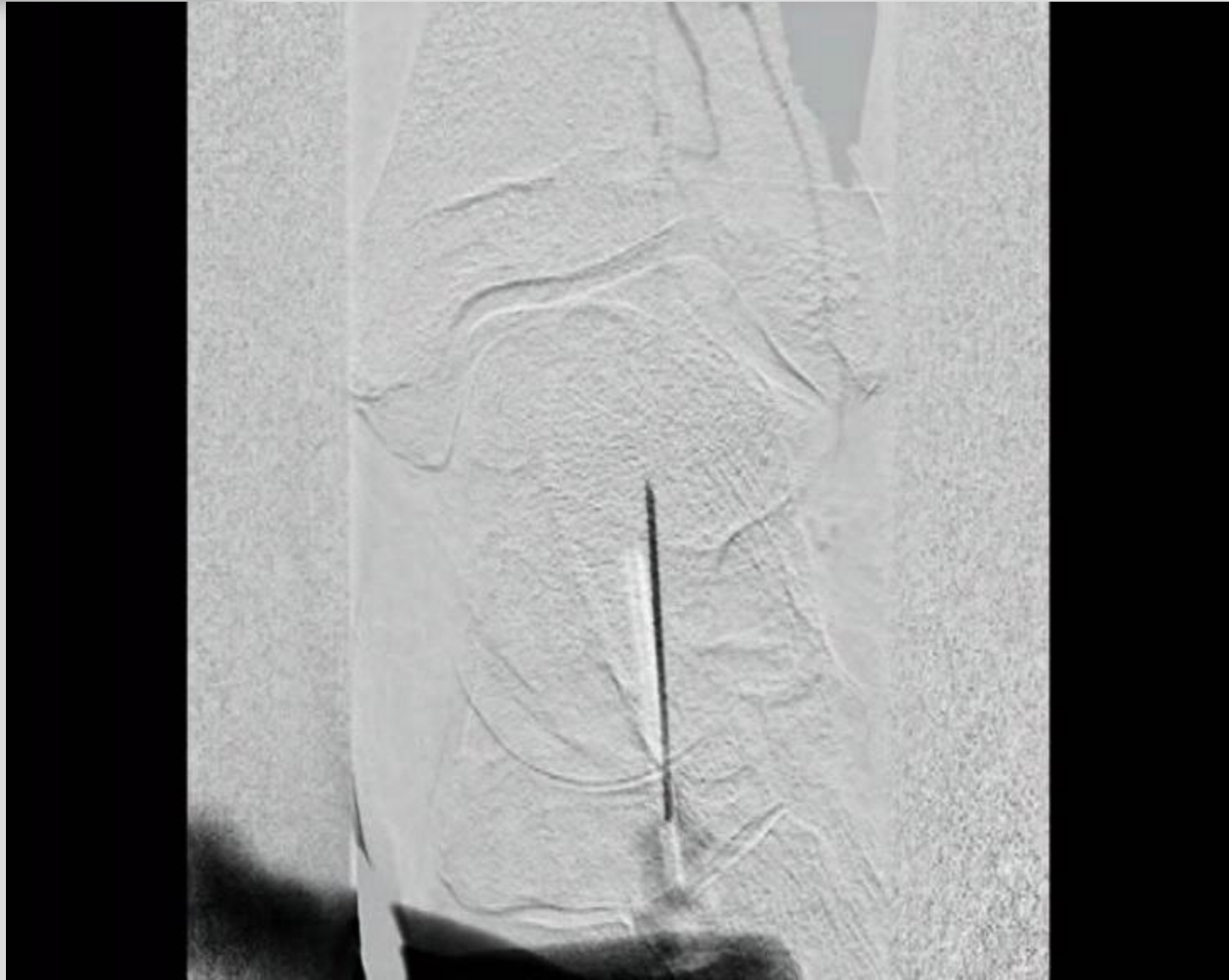
# CASE 1

## Anterior tibial retrograde puncture

- 21 gauge needle puncture
- 0.014" wire



# CASE 1



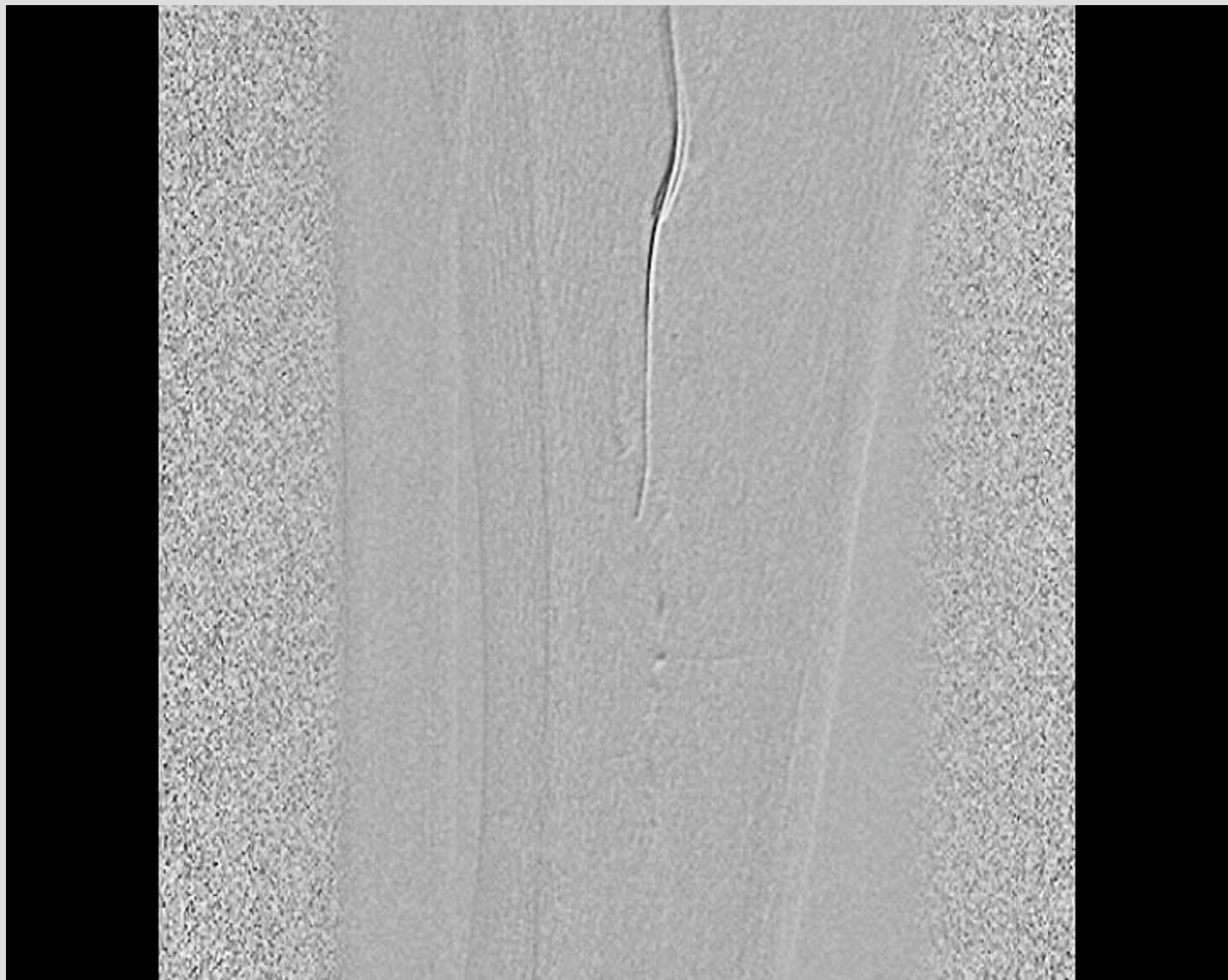
# CASE 1



# **Posterior tibial artery approach**

## **Case 2**





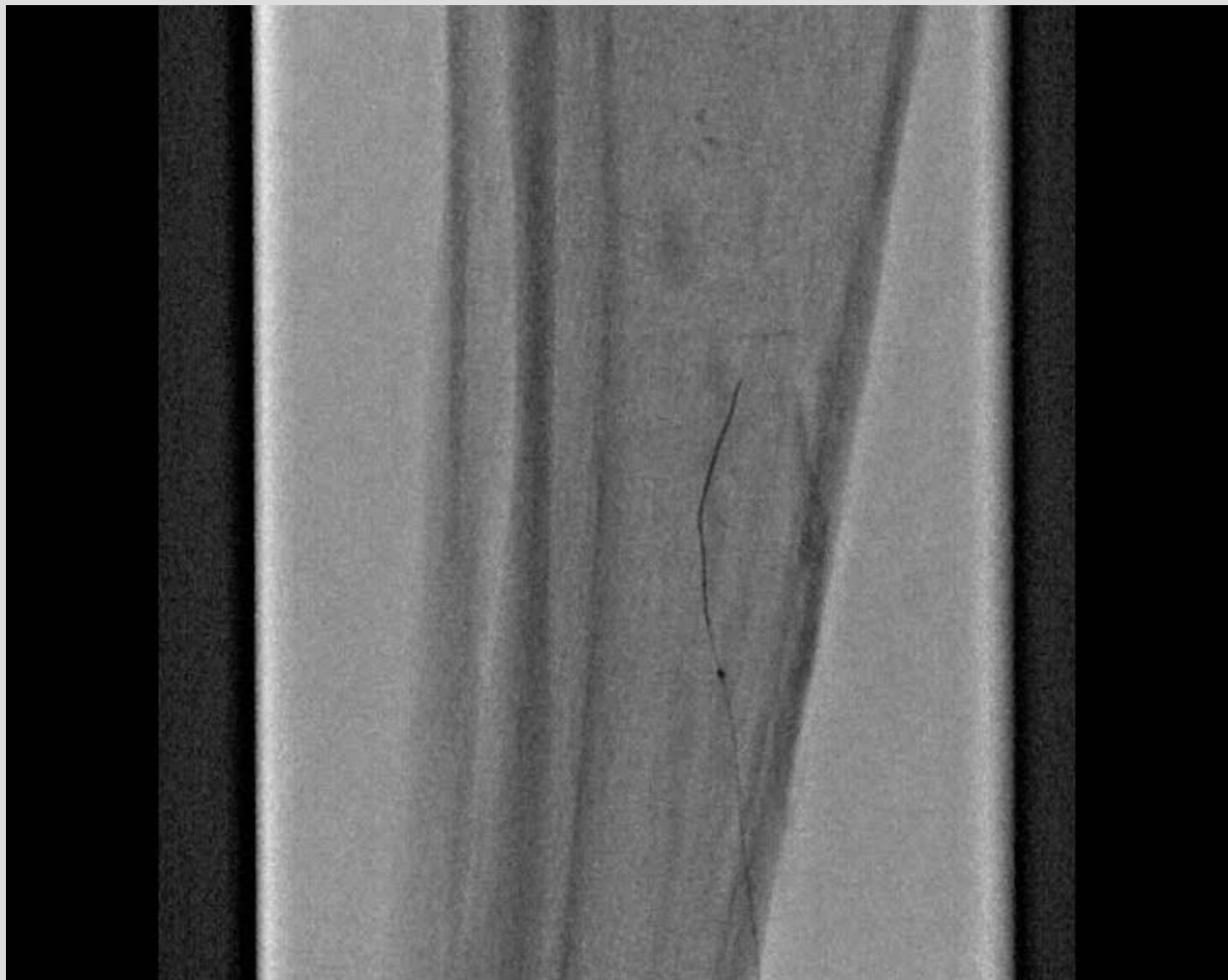
# Distal posterior tibial puncture

---

- DSA imaging
- 21 gauge needle
- 0.014" wire (PT2 Boston Scientific)







# Final Result



# **Retrograde puncture**

## **Case 3**

NONAME 001

Jun 07 2010  
11:13:55

(Filt. 6)

Seq: 2  
FRAME = 1 / 108

WW: 256WL: 128





Jun 0  
-1

FRAME =  
MA

: 2048

NONAME 001

Jun 07 2010  
11:31:37

(FIL 5)

Seq: 7  
FRAME = 4 / 37  
MASK = 2

WWW: 4086WL: 2048

Tibia

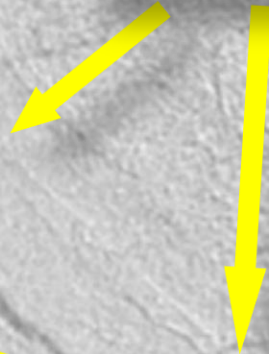
antegrade wire



Jun 07 2011  
11:38:2

astragalus

Med plantar artery (occluded)



heel



Lat plantar artery



(File 5)

Seq: 2  
FRAME = 79 / 9  
MASK = 1



NONAME 001

Jun 07 2010  
11:54:29

(Filt 6)

Seq: 9  
FRAME = 1 / 79

WW: 256 WL: 128

Jun 07 2014  
12:39:03

(FIL 6)

Seq: 10  
FRAME = 9 / 14

256WL: 128



NO NAME 001

Jun 07 2010  
12:51:08

(FIL 5)

Seq: 22  
FRAME = 10 / 55  
MASK = 2

WWW.4096.WL:2048



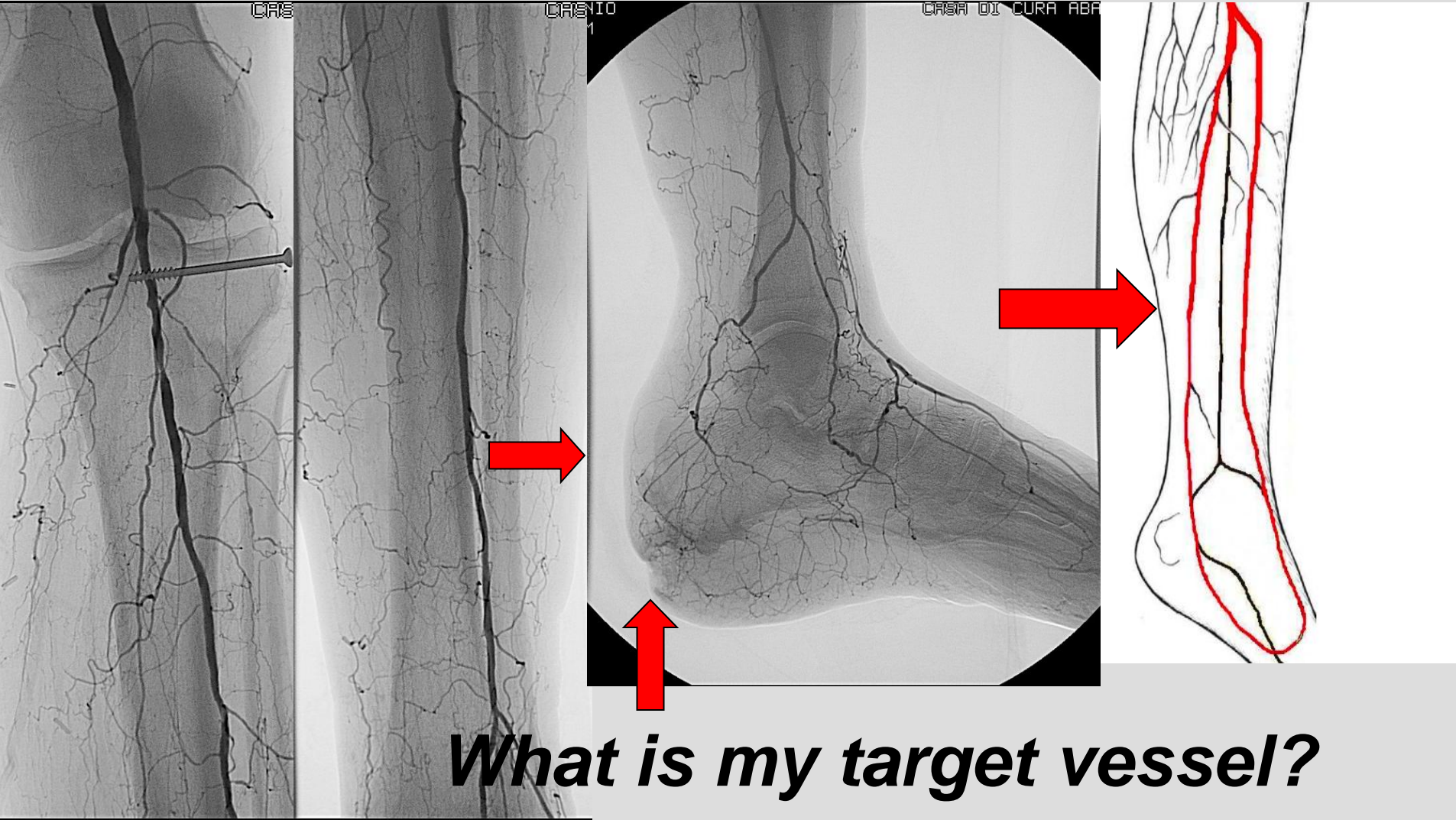
# *Retrograde approach for Complex Popliteal and Tibioperoneal Occlusions*

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<b>Patients n°</b>	<b>51</b>
<b>Success rate</b>	<b>86.3%</b>
<b>Adjunctive stenting</b>	<b>41.1%</b>
<b>Major complications</b>	<b>1.9%</b>
<b>Minor sequelae</b>	<b>7.8%</b>

# UNUSUAL APPROACH

*Where is the foot lesion?*



*What is my target vessel?*

# UNUSUAL APPROACH

*Where are posterior and anterior tibial arteries origins?  
No stumps available!!*



# ***INTERVENTION***



***Pedal artery antegrade puncture and retrograde wiring of plantar and posterior arteries (Pilot 200, 2 mm x 4 cm Amphirion Deep)***

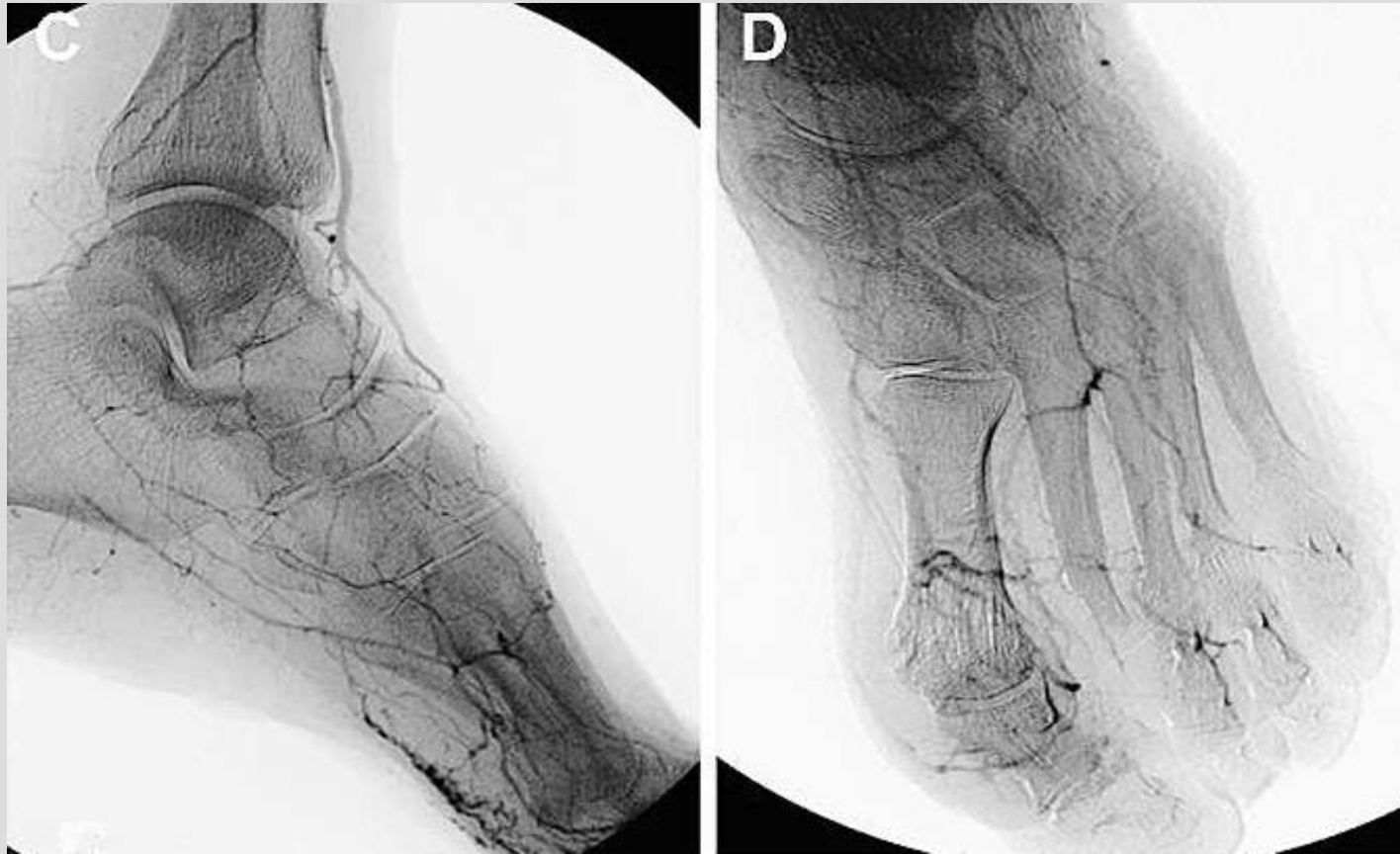


# ***FINAL RESULT***



# Extreme BTK Interventions

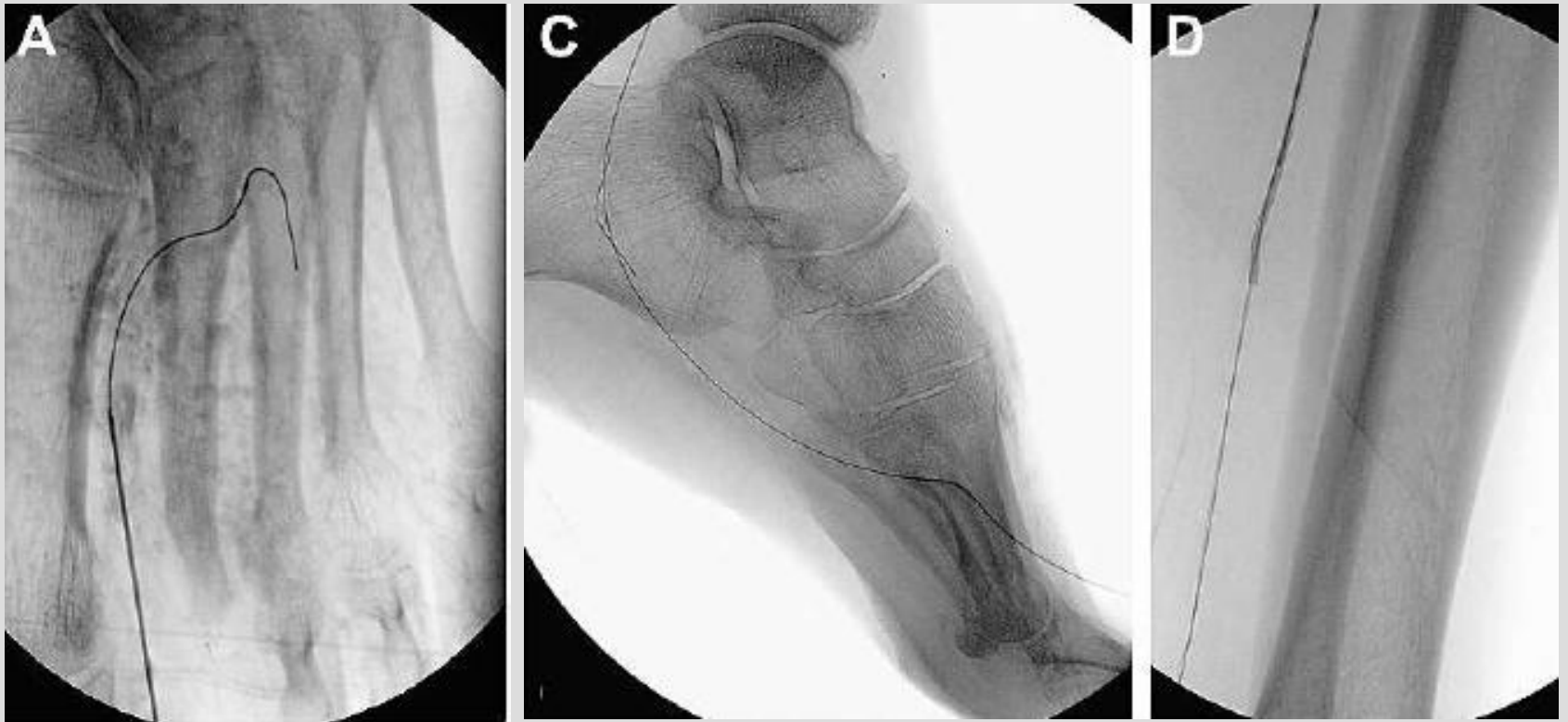
## Retrograde Transmetatarsal Artery Access



**Dorsalis pedis and plantar artery occlusion, with patency of the plantar arch and very thin first metatarsal artery**

# Extreme BTK Interventions

## Retrograde Transmetatarsal Artery Access



**Retrograde access in the first metatarsal artery retrograde wire navigation in first metatarsal artery, the plantar arch and the lateral plantar artery. Rendez-vous in the posterior tibial artery.**

# Extreme BTK Interventions

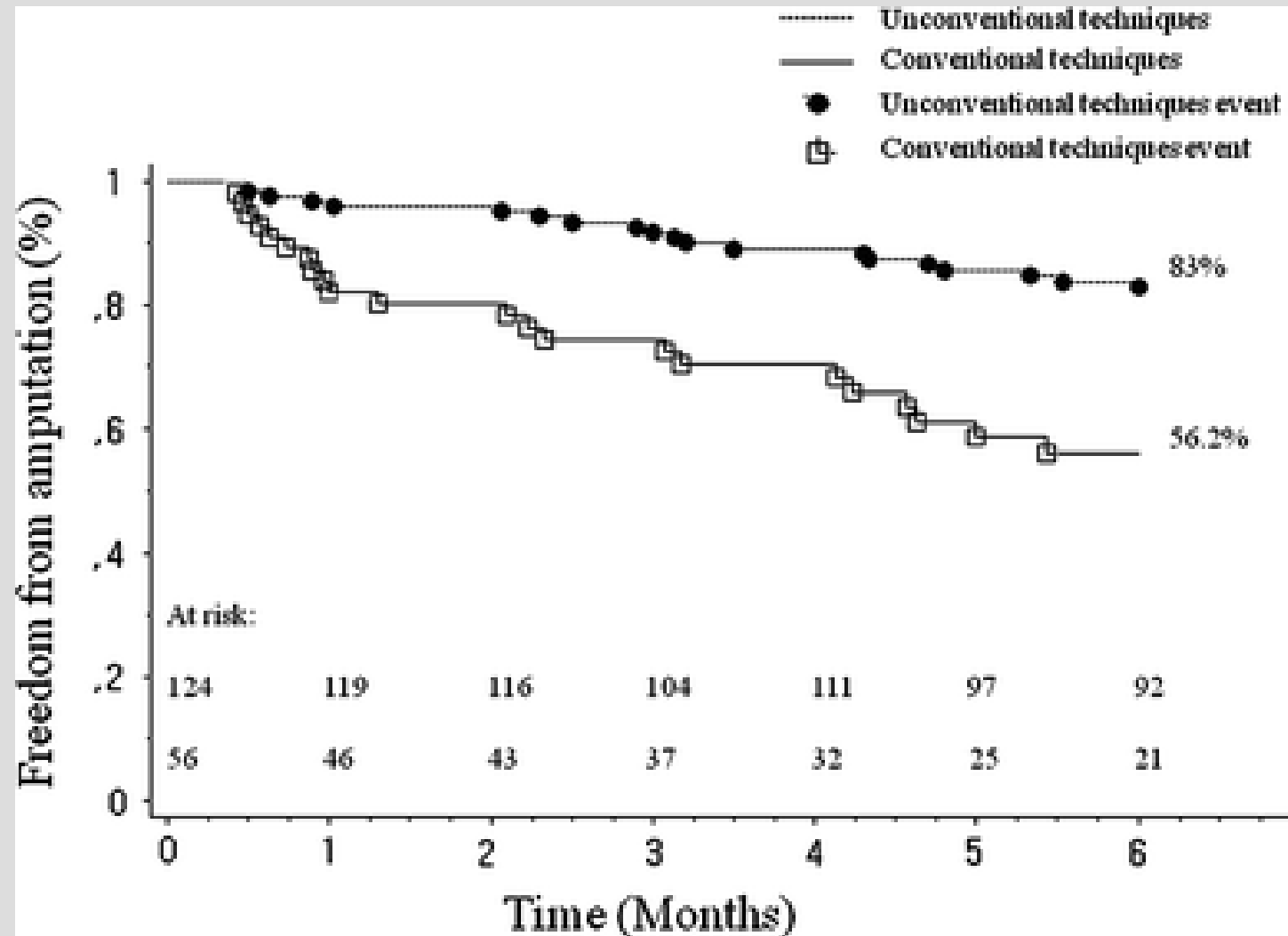
## Final Result



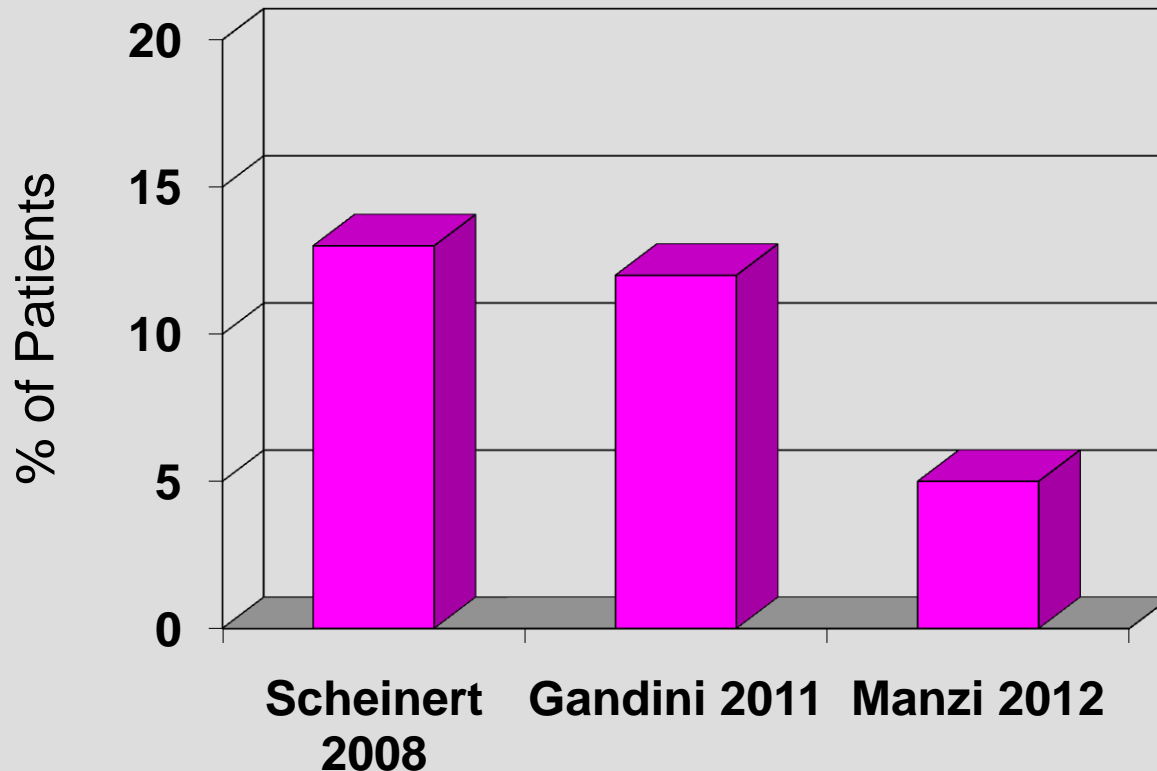
**Patency of the lateral plantar, plantar arch and first metatarsal artery**

# Success for Unconventional Techniques

**Technical Success = 96%**



# Transpedal approach after failed antegrade attempt



Montero-Baker M, *J Endovasc Ther* 2008  
Gandini R, *Cardiovasc Intervent Radiol* 2011  
Palena LM, *J Endovasc Ther* 2012

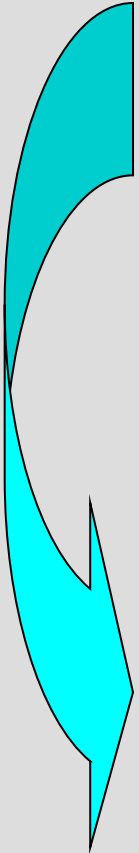
# Vascular Imaging of the foot

The first step toward endovascular recanalization

*“ to select the best revascularization strategy and obtain optimal clinical results we must be familiar with all the aspects of circulation in the foot”*

Manzi M, *Radiographics* 2011;31:1623

- Ipsilateral antegrade approach
- Use of digital subtraction with a large matrix
- Prolonged filming to record delayed enhancement of pedal vessels
- A single projection is inadequate for complete depiction of vasculature
- The pedal-plantar loop should be adequately imaged



# Conclusions

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- The treatment of CTOs for BTK interventions requires the knowledge of different techniques.
- In a step-by-step approach these lesions are first attempted endoluminally.
- A sub-intimal approach is used in about 40% of the cases.
- Transpedal approach is still considered for highly selected cases and is done in <5% of the procedures.