Retrograde Approach with Pedal Puncture

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Milan - Italy
<table>
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<tr>
<th>Attempted CTO lesions in BTK</th>
<th>Interventions in 774 pts</th>
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<tbody>
<tr>
<td>3/51</td>
<td>6 %</td>
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<tr>
<td>246/621</td>
<td>40 %</td>
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<tr>
<td>278/836</td>
<td>33 %</td>
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Successful vs Unsuccessful PTA for BTK

Limb Salvage at 2 Year

- Successful PTA: 95%
- Unsuccessful PTA: 57%

Successful vs Unsuccessful PTA for BTK

Survival Rate at 2 Years

Successful PTA: 95%

Unsuccessful PTA: 43%

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 \[\rightarrow\] Non calcified arteries

“Fluoroscopic”- US Doppler Puncture

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<tr>
<th>“Fluoroscopic”- US Doppler Puncture</th>
<th>[\rightarrow]</th>
<th>Highly calcified arteries</th>
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Image of ultrasound and X-ray images showing vascular structure.
Retrograde (double) approach

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

  - pedal artery → ATA
  - retromalleolar artery → PTA
CASE 1

Anterior tibial retrograde puncture

- 21 gauge needle puncture
- 0.014” wire
Posterior tibial artery approach

Case 2
Distal posterior tibial puncture

- DSA imaging
- 21 gauge needle
- 0.014” wire (PT2 Boston Scientific)
Retrograde puncture

Case 3
Retrograde approach for Complex Popliteal and Tibioperoneal Occlusions

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<tr>
<td>Patients n°</td>
<td>51</td>
</tr>
<tr>
<td>Success rate</td>
<td>86.3%</td>
</tr>
<tr>
<td>Adjunctive stenting</td>
<td>41.1%</td>
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<tr>
<td>Major complications</td>
<td>1.9%</td>
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<tr>
<td>Minor sequelae</td>
<td>7.8%</td>
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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!!
Pedal artery antegrade puncture and retrograde wiring of plantar and posterior arteries (Pilot 200, 2 mm x 4 cm Amphirion Deep)
Retrograde Transmetatarsal Artery Access

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

Palena LM, *J Endovasc Ther* 2012;19;805
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.

Palena LM, J Endovasc Ther 2012;19;805
Extreme BTK Interventions

Final Result

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

Success for Unconventional Techniques

Technical Success = 96%

Gandini R, Cardiovasc Intervent Radiol 2011
Transpedal approach after failed antegrade attempt

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

• 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.