Step-by-step approach in CTOs and the need for retrograde approaches

Vincenzo Foppa, 1462
“The miracle of the salvaged foot”
Cappella Portinari, S. Eustorgio Church
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Disclosure

Roberto Ferraresi, MD

In the last 2 years I have the following potential conflicts of interest to report:

**Consultant:** Medtronic, Abbott, Boston Scientific, Contract Medical International, Cook, Asahi, Ivascular, Biotronik, Limflow, Spectranetics, Shire, Kardia, Astra Zeneca, Orbus, Bard, Philips, Volcano, Novena, Angiodroid, M&L Healthcare

**Virtual shareholder:** Limflow
Step-by-step & retro approaches in FEM-POP
- 2013-2019
- 2701 FEM-POP CTOs

Tips and tricks for a correct “endo approach”

- 76% mean length 112 mm
- 15% mean length 249 mm
- 9% mean length 234 mm

- Antegrade approach
  - 1. Endoluminal
  - 2. Subintimal

- Retrograde puncture

- Transcollateral
  - 1. Pedal-plantar loop technique
  - 2. Peroneal artery branches PTA
Retrograde approaches in SFA-POP CTOs

- SFA 32%
- P3-TPT 24%
- PER 7%
- PTA 11%

Step-by-step & retro approaches in FEM-POP
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Retrograde approaches in SFA-POP CTOs

Anterolateral retrograde access to the distal popliteal artery and to the tibioperoneal trunk for recanalization of femoropopliteal chronic total occlusions

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- 2013-2019
- 2701 FEM-POP CTOs

SFA 32%

P3-TPT 24%

ATA 14%

PER 7%

PTA 11%

DPA 12%
Failure of antegrade crossing
Retrograde puncture

- TPT is the target
- Oblique omolateral view, a little bit caudal, open the space between tibial and peroneal bones
- 21 G needle
- Command 0.018”
- After puncture shift to a 90° projection to deliver the wire
Rendezvous

- Carnelian 0.018” support catheter
- Command 0.018” wire
- Berenstein 4F catheter
- Externalization of the wire
Ballooning

- DCB 5x200 mm 14 atm
Retrograde approaches in SFA-POP CTOs

- SFA 32%
- P3-TPT 24%
- PER 7%
- PTA 11%

Step-by-step & retro approaches in FEM-POP

- 2013-2019
- 2701 FEM-POP CTOs
Retrograde puncture
- Oblique contralateral view
- DPA out of the bones: in the majority of the cases calcifications are sufficient to identify the artery
- Radial needle
- Command 0.014” or 0.018” wires
Retrograde approach

Command 0.14” wire
Failure to cross the lesion
Carnelian 0.014” support catheter

Shift to a CTO dedicated wire and wire externalization
Retrograde Tibioperoneal Access for Complex Infrainguinal Occlusions: Short- and Long-Term Outcomes of 554 Endovascular Interventions.
JACC Cardiovasc Interv. 2019 Sep 9;12(17):1714-1726

Below-the-Knee Retrograde Access for Peripheral Interventions: A Systematic Review.
Welling RHA, Bakker OJ, Scheinert D, Moll FL, Hazenberg CE, Mustapha JA, de Borst GJ, Schmidt A.
J Endovasc Ther. 2018 Jun;25(3):345-352

The tibiopedal retrograde vascular access for challenging popliteal and below-the-knee chronic total occlusions: literature review and description of the technique.
Schmidt A, Bakker OJ, Bausback Y, Scheinert D.

Surgical management of delayed retrograde type A aortic dissection following complete supra-aortic de-branching and stent-grafting of the transverse arch.
Luehr M, Etz CD, Lehmkuhl L, Schmidt A, Misfeld M, Borger MA, Mohr FW.

Techniques and outcome of retrograde crural artery revascularization.
Werner M, Piorkowski M, Schmidt A.

Retrograde recanalization technique for use after failed antegrade angioplasty in chronic femoral artery occlusions.

Retrograde approach for complex popliteal and tibioperoneal occlusions.

... an antegrade recanalization attempt can fail in up to 20% of the cases. The additional use of a retrograde approach seems feasible and safe and can favorably modify this failure rate.
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