


**Pros And Cons Of Re-Entry Devices In Treating CTOs:
Why, Where And When To Use Them.**

**Are They Worth The Cost And Have Other Technique Like Retrograde
Access Largely Replaced Them?**

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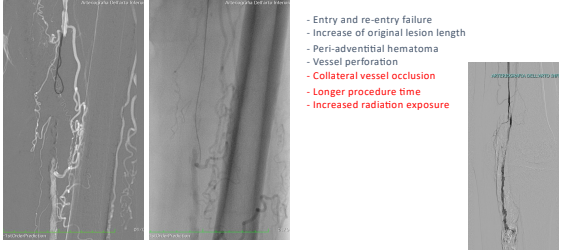
Disclosures

Educational grant: Abbott, Bentley, Cordis, Biotronik, Gore, Penumbra and Terumo
Speaker for: Bentley, Biotronik, Cordis, Medtronic, Penumbra, Shockwave

The traditional antegrade ipsilateral and contralateral femoral approaches fail to cross the lesion in roughly 20% of cases

Montero-Baker M, Schmidt A, Bräunlich S, et al. Retrograde approach for complex popliteal and tibioperoneal occlusions. *J Endovasc Ther.* 2008;15:594-604
Rogers RK, Dattilo PB, Garcia JA, et al. Retrograde approach to recanalization of complex tibial disease. *Catheter Cardiovasc Interv.* 2011;77:915-925

SUBINTIMAL RECANALIZATION
Predictable re-entry into the reconstituted true lumen distal to occlusion remains the limitation of the procedure



- Entry and re-entry failure
- Increase of original lesion length
- Peri-adventitial hematoma
- Vessel perforation
- Collateral vessel occlusion
- Longer procedure time
- Increased radiation exposure

The tibipedal retrograde approach provide another endovascular option to cross infrainguinal particularly in patients with poor surgical options, with a crossing success achieved in up to 90%

Walker CM, Moustapha I, Zeller T, et al. Tibipedal Access for Crossing of Infrainguinal Artery Occlusions: A Prospective Multicenter Observational Study. *Journal of Endovascular Therapy* 2016, Vol. 23(6) 839-846

171 patients
Ruth V/VI 67%
CTO fem-pop, BTK with failed antegrade treatment followed by retrograde approach
CTO>20 cm in 45.6%

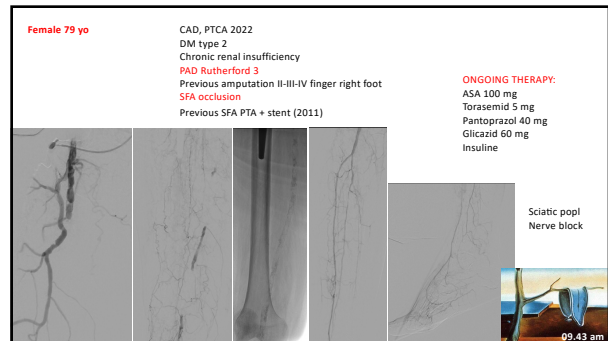
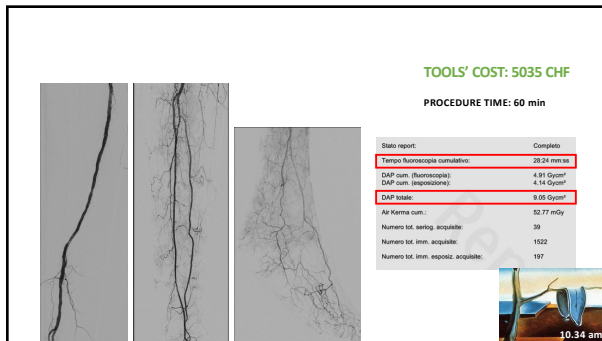
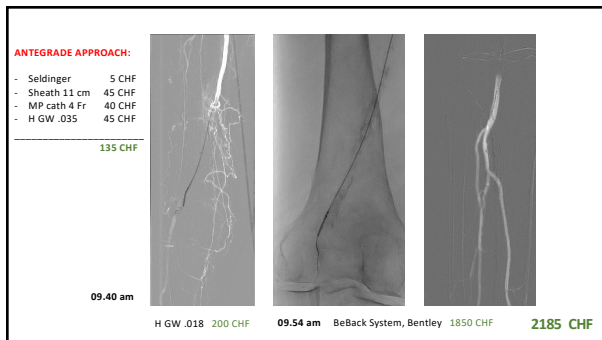
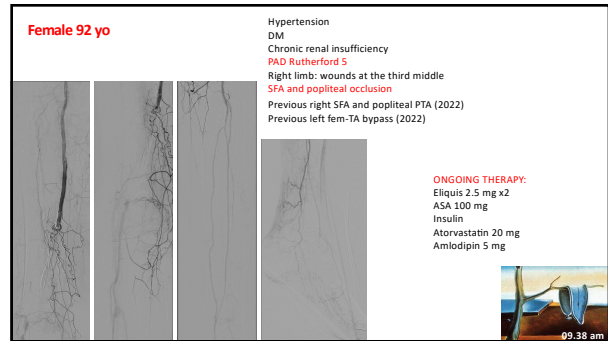
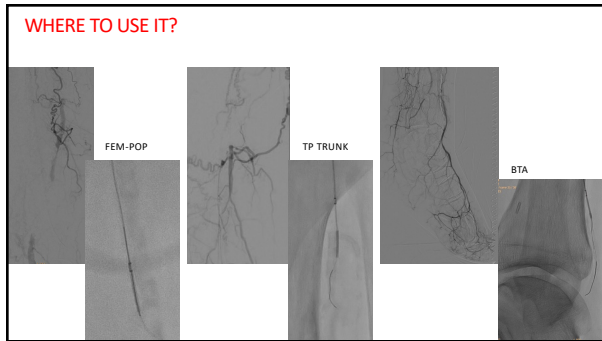
Technical success: 82%

This approach could lead to sacrifice of a distal bypass target or loss of limb in a patient not previously at risk for amputation.

IN THOSE CASES... CONSIDER A RE-ENTRY DEVICE




| | 2.0 | 4 | 5.5 | 4.0 |
|------------------------------------|-------------------------------------|---------|---------|----------|
| Company Name | BeBack BeBack | | | |
| Product Name | crossing catheter crossing catheter | | | |
| Catheter Size (F) | 2.0 | 4 | 5.5 | 4.0 |
| Wire Size (inch) | 0.014 | 0.018 | 0.014 | 0.018 |
| Working Length (cm) | 80, 120 | 80, 120 | 80, 120 | 120, 150 |
| Minimum Guiding Catheter ID (inch) | 0.04 | 0.06 | 0.075 | 0.066 |



ANTEGRADE APPROACH:

- Seldinger 5 CHF
- Sheath 11 cm 45 CHF
- MP cath 4 Fr 40 CHF
- H GW .035 45 CHF

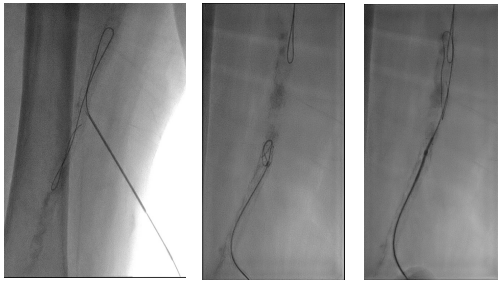
135 CHF



- H GW .018 200 CHF

10.01 am

235 CHF




- 2nd .018 200 CH

- 2nd sheath 45 CHF

- 2nd MP cath 4 Fr 40 CHF

10.21 am

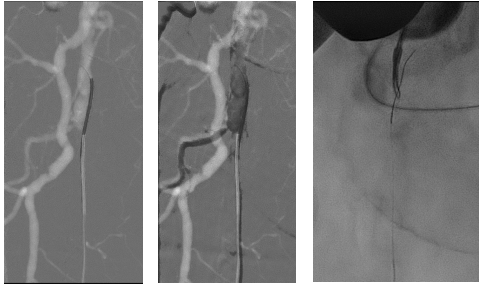
520 CHF



Patients complaining for back pain

Requested anesthesiology


Mild sedation of the patient



- Goose Neck 600 CHF

11.15 am

1120 CHF

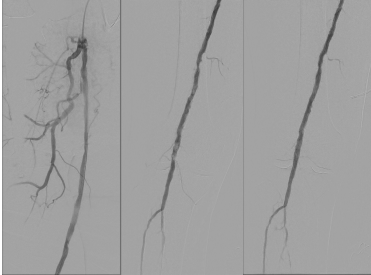


- SE stent 1400 CHF

- PTA ballon 300 CHF + DEB 1150 CHF


12.05 pm

3970 CHF



TOOLS' COST: 3970 CHF

PROCEDURE TIME: 159 min



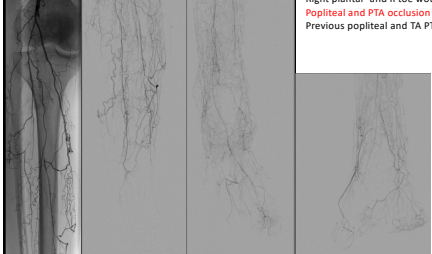
12.22 pm

| State report: | Complete |
|-----------------------------------|---------------|
| Tarjetas fluoroscopia combinadas: | 24.11 minutos |
| DAP (cm): (fluoroscopia): | 29.1 Gy/cm² |
| DAP (cm): (radioterapia): | 21.8 Gy/cm² |
| DAP (cm): | 50.9 Gy/cm² |
| Air Kerma (cm): | 593.75 mR |
| Numero fot. (expos.): | 65 |
| Numero fot. (expos.): | 1762 |
| Numero fot. (expos.): | 291 |

Male 92 yo

Hypertension
DM
PAD Rutherford 5
Right plantar and II toe wounds
Popliteal and PTA occlusion
Previous popliteal and TA PTA (March 2024)

ONGOING THERAPY:
LMWH 5000 UI x2
ASA 100 mg
Insulin
Atorvastatin 20 mg
Amlodipin 5 mg



03.12 pm


ANTEGRADE APPROACH:

- Seldinger 5 CHF
- Sheath 11 cm 45 CHF
- MP cath 4 Fr 40 CHF
- H GW .035 45 CHF

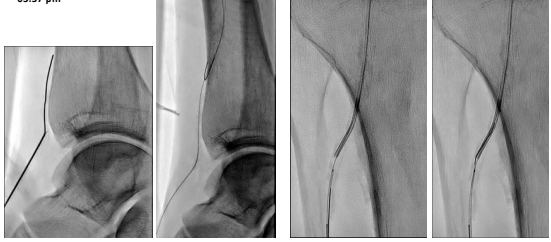
135 CHF

- H GW .018 200 CHF
- H GW .014 200 CHF

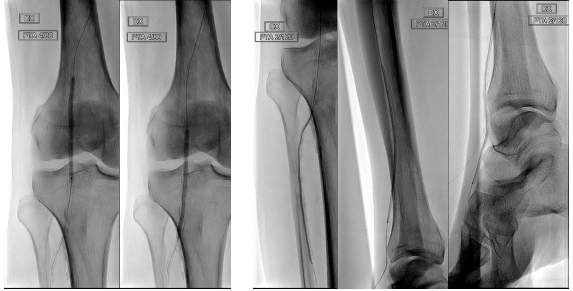
03.25 pm
535 CHF




03.37 pm



Retrograde puncture set 100 CHF
2nd H GW .014 200 CHF
Supportive microcath .014 700 CHF
03.55 pm
1535 CHF



PTA 300 CHF
2nd PTA 300 CHF
04.24 pm 2135 CHF

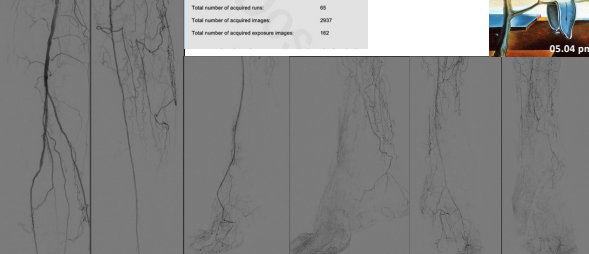


HP PTA 230 CHF
2nd HP PTA 230 CHF
3rd HP PTA 230 CHF
04.44 pm
2825 CHF

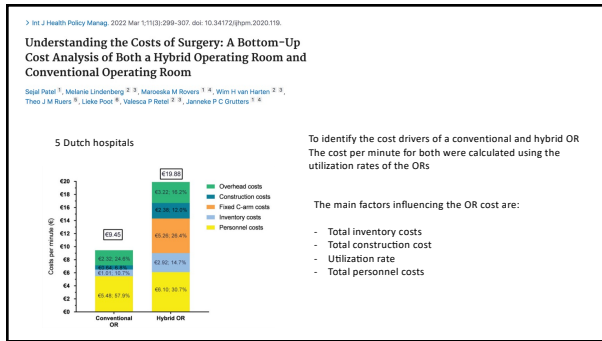
| | |
|---|-------------------------|
| Report status: | Complete |
| Cumulative fluoroscopy time: | 32:25 min:ss |
| Cumulative DAP (fluoroscopy): | 4364 mR@cm ² |
| Cumulative DAP (angiography): | 1800 mR@cm ² |
| Total DAP: | 6163 mR@cm ² |
| Cumulative Air Kerma: | 74.71 mR@y |
| Total number of acquired films: | 495 |
| Total number of acquired images: | 2637 |
| Total number of acquired exposure images: | 162 |

TOOLS' COST: 2825 CHF

PROCEDURE TIME: 118 min



05.04 pm



FINAL COST ANALYSIS

| Procedure | Tools' cost (CHF/Euro) | HR costs (Euro) | Total cost (Euro) |
|---------------------|------------------------|---------------------|-------------------|
| Re-entry device | 5035/5376 | 56' x 19.88 = 1113 | 5489 |
| Retrograde fem-popl | 3970/4238 | 159' x 19.88 = 3160 | 7398 |
| Retrograde ATA | 2825/3016 | 118' x 19.88 = 2345 | 5316 |

> P. Radiol. 2018 Nov;81(10):1017-1021. doi: 10.1007/s10930-018-0716-6. Epub 2018 Aug 13.

Patient doses in endovascular and hybrid revascularization of the lower extremities

Devidas D Kumbaveera ^{1,2}, Naresh N Nekkai ¹, Stefan S Stawer ¹, Bouke B Stegmann ³

259 patients retrospectively analyzed
Grouped by intervention type, vascular approach and level of complexity
Correlation of doses values with the operating team

| Approach | Kerma Area Product (Gy.cm ²) | Fluoroscopy time (s) |
|----------------------------|--|----------------------|
| Brachial | 347 | NA |
| Controlateral CFA | 207 | 153 |
| Ipsilateral CFS | 96 | 78 |
| Hybrid Surgery | 77 | 41 |
| Ipsilateral retrograde pop | 61 | 53 |

The type of vascular access has the highest negative impact on radiation dose as increased number of stents and level of complexity

To evaluate the dose parameters describing exposure of patients undergoing EV or hybrid procedures of the lower limb

- Compare data available for patients doses and related factors
- Examine correlations of doses with certain parameters
- Estimate the peak skin dose and assess the potential for radiation-induced skin injuries during procedure

- ### TAKE-HOME MESSAGES
- Retrograde access can be a complex solution in non-skilled hands
 - Patients compliance has to be accurately evaluate before the procedure
 - Re-entry system can reduce the procedure time and radiation exposure
 - Can be used for different target artery
 - These devices are expensive but the cost can be balanced by shorter operative time