Hydrodynamic boost: a novel re-entry technique in distal BTK vessel: when and how to do it

1. The concept
2. The patients
3. The technique:
   • Dorsalis pedis artery
   • Plantar artery
4. What to do in case of failure
5. Results

Disclosure

Roberto Ferraresi, MD

I have the following potential conflicts of interest to report: consulting, travel reimbursement, teaching courses, training, proctoring:

- Medtronic
- Boston Scientific
- Abbott
- LimFlow
- Tarano
- Cook
- Biotronik

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Manual injections of contrast were used in an attempt to directly open the distal dissection into the true lumen. Once successful a conventional floppy wire was then manipulated through the dissection plane into the distal true lumen. This technique was considered to be feasible and relatively safe.

They also described the “storm cloud dissection”, a diffuse staining of contrast media probably indicating vessel dissection with contrast extravasation into the adventitia, a clear sign to continue the procedure using other approaches.


Vascular surgeons used fluid injection (gas or water) to perform endarterectomy. This surgical technique provides uniformly smooth endarterectomy dissection planes over the entire length of operated vessel, and had demonstrated to be easier and safer than conventional endarterectomy.
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**The hydrodynamic boost was applied in 14% of subintimal re-entry, only in case of:**
1. Tibial CTOs extended to the ankle or below-the-ankle level
2. Failure of the wire to re-enter into the "most proximal part" of the distal target vessel
3. Absence of calcification and/or disease of the distal target vessel

**280 tibial CTO extended to the ankle or below-the-ankle level**

- **Endoluminal approach**: 100%
- **Subintimal approach**: 63%
- **Failure to get the ankle**: 3%
- **Able to get the ankle**: 60%

**January 2014 - March 2015**
- 432 CLI pts
- 544 endovascular procedure

- 100%
- 63%
- 14%

Hydrodynamic Boost: a novel re-entry technique in subintimal angioplasty of below-the-knee vessels
2015 Ferraresi R et Al. Accepted for publication on European Radiology

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- In 19/23 (83%) cases, the HB was effective in creating a connection between the subintimal space and the true distal lumen and it was possible to advance a wire and to conclude the procedure.
- In 4/23 (17%) lesions, the HB failed and the procedure was successfully completed by retrograde approach.
- No major complications occurred.
- Mean length between catheter tip and re-entry point was 8.2±5.3 mm.
Wrong conclusion

HB is a feasible, safe and effective re-entry technique in distal below-the-knee vessels. This method represents an easy option for re-entry that extends the possibility of antegrade approach to obtain a successful revascularization.

True conclusions

HB is an option to use in very particular cases where the success can be achieved also with standard techniques. However it is useful to demonstrate that:

1. Subintimal space is not one! It is a “family” of anatomical planes with different physical properties and it is essential in subintimal angioplasty to be able to recognize these properties.
2. Only a high volume center can guarantee a deep knowledge of every possible approach in distal CTOs.

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