Antegrade Wire Escalation Technique for Crossing CTOs – Wire Tips & Techniques

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Disclosure

- Received honoraria for physician training courses from Cordis, CSI, BSCI, Cook, Medtronic
Factors That Influence CTO Treatment Success

- Age of occlusion
- Lesion length and morphology
- Calcification
- Presence of collaterals
- Distal flow

Historically treatment success rate < 70%
CTO’s in the Mid 1990’s

- No controllable CTO guide wires
- Low success rate, high complication rate
- No concept of penetration with stiff guide wire technique
- No information on CTO pathology
- No designated CTO crossing devices
The Main Reason Why Treatment Fails is Inability to Cross the Lesion with a Guide Wire
Guide Wire is a Complex Structure

**CORE COMPONENTS**
- Core Materials
- Core Diameter
- Core Taper

**EXTERNAL COMPONENTS**
- Coatings
- Coils & Covers
- Tip Design

*The Building Blocks of All Guide Wires*
Clinical situation

- **Type of access** (Femoral, Radial, Pedal, etc.)
- **Vessel anatomy** (straight run-off, acute angles, tortuous, etc)
- **Lesion location** (Iliac, SFA, ATA, PTA, etc)
- **Lesion type** (Single/multiple stenosis, long/short occlusion, calcified, etc.)

Guide Wire Selection

- **Torque**
- **Tip Durability**
- **Tactile Feedback**
- **Penetration Power**
- **Trackability**
- **Support**
- **Crossing**
- **Flexibility**
- **Prolapsing**
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Guide Wire Selection

Most important considerations when selecting a wire for treating CTOs

1. Torque response
2. Tip feel (tactile response)
3. Tip shape – curve formation

Hydrophobic wires
- Provide better tactile response to operator
- Better for fibrotic calcified lesions, generally > 3 month old CTO, b/c they provide operator improved tactile response to better navigate micro-channels
- To get into the “dimple” and use tip load to purchase fibrous cap

Hydrophilic wires
- Better for < 3 month old CTOs –soft, lipid laden plaque
- Hydrophilic wires with tapered tip may improve the locating of micro-channels, however micro-channels can lead to false lumens/sub-intimal spaces
- Hydrophilic wires tend to follow the path of least resistance and generally offer less tip control
Why so difficult to cross it?
Tip Shapes

For penetrating the entry point

For re-entering to the true lumen
from the subintimal
Japanese Techniques (coronary CTO)

Drilling Technique

- Intermediate GW
- Standard GW
- Stiffer GW
- Other Stiffer GWs
- Confiancea GW

Penetration Technique

- Intermediate GW
- Not Cross
- Not Cross
- Not Cross
- Not Cross
- Confianza Pro GW

Approach for Beginners
- Approach for Experienced Operators
Asahi Astato 30
When Other Wires or Crossing Devices Fail

- The strongest peripheral wire available
- High tip load allows precise penetration into CTOs with tough caps
- Key: Rotate wire 180° with no bend on wire tip
Make sure you know where is your target.
Wires and Catheters for Crossing CTO’s

**SFA**
- .035” Glide Wire and Support Catheter. If directing wire is an issue use angled support catheters
- .018” Support catheter and CTO wire (Aasto, .018” 30gr, Approach 25 etc) or Hydrophilic .018 wire (V18 control, Terumo Gold)
- 014” CTO and hydrophilic wires could be used for re-entry into true lumen from sub-intimal space

**Popliteal**
- As above, but .018 wire and support catheter are most commonly used

**BTK**
- 018” and 014” support catheters and designated CTO (Aasto, Approach, Confianza etc) and Hydrophilic wires (Approach Hydro ST, Commander etc)
If wire is subintimal consider Subintimal Angioplasty

- Opens a totally occluded blood vessel
- Angioplasty is performed in the artery wall (subintimal space)
  - SIA creates new channel within subintimal space, under occluded lumen
- Differs from traditional angioplasty, which occurs within the vessel lumen (intraluminal) with balloon opening narrowed lumen
SIA: Procedure

Step 2: Subintimal Entry

- Prolapsed .035-in stiff angled Glidewire
  - Wire advanced with force
  - Obtain “spiral configuration” and advance with more force
  - Use support catheter as backup to support the wire
  - Advance catheter and Glidewire as one unit
CASE 1: Long SFA CTO, 0.035 support catheter and 0.035” Terumo stiff shaft glide wire
Astato .018 30 gr
Astato switched to 035 Terumo glide, wire tip prolapsed and pushed forward to distal cap with support of .035 catheter
At the distal cap glide wire was removed and .018 Astato was used to re-enter into true lumen
Support catheter advanced into popliteal with test injection confirming intra-luminal position
CLI Case with BTK disease

- 93 y. o. female with h/o DM-2, HTN, CAD, hyperlipidemia, PAD with left fem-pop bypass in 2005. S/P Left 4\textsuperscript{th} toe amputation due to gangrene.
- Presents with Non-healing L Foot Ulcers x 4 months ago.

Angiography of the LLE:

- SFA – totally occluded
- Femoro-popliteal bypass graft - patent
- AT – diffusely severely diseased, occluded in mid segment
- TPT – occluded
- PT – occluded
- Peroneal artery – occluded
Distal Runoff
Proximal lesion crossed with Approach Hydro ST .014 wire
Wire exchanged to Astato .014 20 gr CTO wire
Astato was advanced into DP
After PTA and spot Stenting with coronary DES