Atherectomy Devices: What Works Best in Which Lesions?

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Disclosures

• *Symposia Honoraria & Proctor Fees*:  
  – Abbott, Endologix/ TriVascular

• *Symposia Honoraria*:  
  – Boston Scientific, Bard, Gore, CSI, Medtronic

• *VIVA Board Member*

• *National PI/Co-PI*: Confidence, SAPHIRE WW, CANOPY

• *Research Grants, Stocks, Equity*  
  – None
Atherectomy: Background Considerations

- There is little conclusive randomized data providing evidence of atherectomy superiority.
- Atherectomy adds cost to procedures, and may increase procedural time and complications.
- There is a “learning curve” for devices.
- One should be selective in the decision of whether or not to use atherectomy, and individualize the choice of device to the patient.
“Advantages” of Atherectomy

- “Deals with” issues of CA++, thrombus
- Larger lumen gain with less dissection
- Allows for better drug delivery to wall
- Allows for better stent expansion
- May minimize or obviate stenting needs
  - “Nothing left behind”; ↑ future options
- ↑ Options in “No stent zones”, small SFA
- Complimentary with DCB’s & EPD’s; theoretically ideal for small vessels, ISR, etc.
Atherectomy: 
Proper Technique is Essential!

- Devices will perform poorly if used incorrectly OR in the wrong patients or lesions
- In general, SLOW advancement of devices
- Devices work better within the true lumen (CTO’s)
- Sizing of device and “speeds” (rotational, “blades up”, rates, fluence, etc.) is important
- Need experience from others during “learning curve”
- CASE SELECTION is critical!
Embolic Protection and Atherectomy

- I have a low threshold for EPD use: ↑ use if lesion has ↑ embolic risk OR if BTK disease
- Spider- FDA approval, rest “off label”
- I prefer independent wire EPD system (NAV 6) with XC length wire- ↓ basket movement
- CSI- can use 0.017 tip Viper wire with NAV6
Atherectomy Device 1 (CA++)

CSI’s Orbital Atherectomy System

Diamondback Specs:
- 160 cm working length
- ≥ 4 Fr sheath compatible
- Easy set-up

ViperWire:
- 335 cm length
- .014” wire with .014” or .017” tip

Crown Sizes:
- Classic Crown: 1.50 and 2.0 mm
- Solid Crown: 1.25, 1.50, and 2.0 mm
- Micro Crown: 1.25 mm
CSI Orbital Atherectomy

- Most useful for heavy, relatively focal calcified femoro-popliteal or BTK Ca++ disease
- Does have risk of distal embolization; If EPD used ("off label"), use Viper wire (0.017 tip) in combination with NAV 6 EPD
- Keep runs short (< 20 seconds), use IA NTG, advance slowly, respond to "feedback"
- Works in BOTH directions, 3 rotational speeds
Note: foot vascular supply
XC 0.014 Command; XC to Viper 0.17 tip
NAV6 in PT Over Viper 0 17

Shuttle Sheath in mid popliteal
CSI 1.5 crown @ low & medium speeds
Angio after moderate speed CSI
Orbital atherectomy @ high speed
Angio after High Speed CSI
Shuttle Sheath

Final result after DCB
Highly CA++ Disease w/ BTK issues
Crossing CTO w/ GW

Angio thru 0.035 QC cath
Crossing with 0.014 wire; XC to Viper 0.017 tip
CSI Orbital atherectomy w/ NAV 6dEPD

DCB after PTA
No Flow
2nd 0.014 wire thru 0.035 QC cath

Aspiration into EPD basket
EPD out; 2\textsuperscript{nd} wire still in
This is why we use embolic protection
Jetstream Atherectomy System

- **Endovascular technology for complex lesion morphologies**
  - *Differential cutting* for plaque, calcium and thrombus

- **Single device solution for treatment from SFA to below the knee**
  - Expandable blade technology

- **Active aspiration + front-end cutting**
  - Designed for efficiency and safety
    - Reduced procedure time
    - Minimized risk of distal embolization
    - Aspirates in reverse also ("Rex")
Jetstream Advantages/ Caveats

- Works WELL in ALL plaque types from extensive thrombus to heavy Calcium, and everything in between
- Lumen gain >> device size/ diameter
- Excellent debulking
- Single device needed, works forward (“blades down”, “blades down”), and in reverse (“Rex”); efficient device
Jetstream Procedural Tips

• Advance/ withdraw the device SLOWLY
• Pay attention to audial & tactile feedback
• NEVER force the device
• “Pecking”; if resistance in blades up, pull device back, re-do “blades down”; retry
• Consider R/B ratio of embolic protection
• If significant thrombus develops, or “full basket”; use Jetstream (“Rex” from EPD)
L CFA, SFA, PFA Disease
CFA, SFA, PFA Disease
“Blades up”

Angio after “blades up”
Focal force PTA CFA, SFA, PFA
DCB CFA and ostial SFA
ISR in long stented area

Excellent application of Jetstream - CM Opinion
Angio after Jetsream

Ostial SFA disease
4 overlapping DCB’s after PTA
Final runoff
Laser Advantages/Disadvantages

• Works very well for thrombus (new and old) and up to moderate calcium; versatile
• Can do long runs, multiple sizes available, devices small enough to go into foot
• Good for ISR with Turbo Power; relatively low embolization rates (c/w other atherectomy)
• Excellent for crossing recalcitrant CTO’s
• Disadvantages: Not good for heavy Ca++, requires console
R popliteal and TPT relatively sudden occlusions
Crossing popliteal CTO (within true lumen)

Confirming R AT angio
Laser atherectomy R popliteal
Angio popliteal after laser
Prolonged DCB inflation R popliteal
Crossing TPT CTO
Laser Turbo Tandem ISR/CTO
Turbo Tandem (now Turbo Power)  
(after creating a "pilot channel")
Angio after Turbo Laser

Final DCB’s
SilverHawk Advantages/Disadvantages

- Effective plaque excision, may offer the most effective debulking; can “cut away” dissections
- Potential “stand-alone” results CFA & pop
- Well-studied, studies ongoing
- No console
- Can work for ISR carefully (off-label!; I prefer Laser or Jetstream) to Silver Hawk for iSR)

Disadvantages: Not effective for thrombus, previously not for heavy Ca++, frequent device removals, ↑embolization; highly recommend EPD
Left Common Femoral Artery Disease with Dissection, AND bifurcation disease
Additional proximal SFA disease

Distal embolic protection
Silver Hawk used to treat the CFA Dissection, then bifurcation
Much better

More directed cuts
Silver Hawk in SFA
DCB Profunda and CFA; previous DCB CFA and SFA
Final CFA and Bifurcation

Some debris within filter
Conclusions

- Selective use of atherectomy may improve outcomes in lesions where its use overcomes challenging issues of the lesion.
- Atherectomy may improve “vessel preparation” and ultimate drug delivery to the vessel.
- Appropriate device selection and meticulous technique are needed for atherectomy success.
- More data is needed to confirm its benefit.
Thank You Very Much for Your Attention!
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