The Major Ongoing Need: What is the Latest in Managing Calcification?

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Disclosures

- **Symposia Honoraria & Proctor Fees:**
  - Abbott, Endologix

- **Symposia Honoraria:**
  - Boston Scientific, Medtronic, Penumbra, Shockwave

- **VIVA Board Member**

- **National PI/Co-PI:** C-GUARDIANS, CONFIDENCE, SAPHIRE WW, CANOPY, PERFORMANCE 3

- **Stock Options:** INSPIRE MD

- **Research Grants, Stocks, Equity:** None
My Strategies for Heavily CA++ Fem-pop Lesions

• CA++-specific *Pre*-treatment, *Then* DCB +/- Supera stent
  • CSI orbital atherectomy WITH Viper 0.017 tip and NAV6 dEPD
  • Shockwave lithotripsy PTA, dEPD rarely needed
• Aggressive Pre-treatment and planned Supera stent
  • Noncompliant PTA or CA++-specific treatment, FULLY dilated
• “Pave and Crack” *provisionally as case unfolds*
  • If pre-treatment issues, add Viabahn, safely ↑ treat, add Supera
• Other Potentials: Jetstream, Silver Hawk *with embolic protection*
• I wire tight CA++ “micro-channels” *with XC 0.014 wires*
Thoughts from My PV Shockwave Experiences

(For most Aortic, iliac, CFA lesions; some fem-pop)

• Works extremely well in severely CA++ lesions (esp. circumfential CA++)
• Creates a predictable large lumen (>> atherectomy)
• Has very low dissection rates
• If no thrombus, has LOW distal embolization rates
• Can be used as “stand alone” treatment in large caliber vessels, especially to facilitate large bore access (EVAR, TAVR, F-EVAR)
CM Shockwave Thoughts-2

- Can use with several wires and in sub intimal space
- Large 8,9,10,12 X30 balloons to provide safe large lumens in large vessels (CFA → Aorta); facilitate large bore
- Gives MUCH larger luminal gain in large vessels compared to available atherectomy devices (CFA ↑)
- Can be used in femoro-popliteal lesions (followed by DCB, interwoven stents), or in calcified tibial vessels
R DP occluded; PT dominant

Severely Calcified Distal Popliteal Disease: CLI
CSI 1.5 crown @ low & medium speeds

Re-assess after moderate speed CSI
Orbital atherectomy @ high speed

Focal force balloon and DCB
Final trifurcation

Final runoff
Highly CA++ Disease w/ BTK issues
Angio thru 0.035 QC cath

Crossing with 0.014 wire
Distal EPD (Nav 6)  
(0.017 tip Viper wire; “off label”)  

CSI Orbital atherectomy  
w/ dEPD
No Flow
Aspiration into EPD basket

EPD out; 2nd wire still in
Long CA++ SFA Disease

Same Full Basket” scenario 2023
CSI with distal protection
Supera stent

“Full basket”
CAT 7 at proximal dEPD

dEPD into CAT with Aspiration
Nice flow, no distal embolization
Heavy CA++ L popliteal Symptomatic lesion
Nice expansion of Shockwave

Nice result after Shockwave; No dissection
DCB 6X60
Nice final popliteal

Nice final runoff
Stents in Calcium??
Interwoven Stents (Supera)

**Advantages**

- *Increased radial strength* (4-5X STNS’s)
- ↑Compression resistance - ↓↓recoil
- Physiologic conformability and flexibility
- Durable, fracture proof
- Lesion MUST be pre-treated adequately before stent placed
- Frontline stent in my opinion for CA++

"Vascular-Mimetic"
Atherotomy & Supera: CA++ Adductor Lesion
Focal Force PTA SFA and Popliteal

6mm @ 14 atm, with dEPD
Deploying Supera

Immediate results w/o post dilatation
“Vascular Mimetic”
Subintimal CA++ SFA CTO
300 cycles of Shockwave IVL w/ 6.5X60 balloon
Supera 6.5 mm Interwoven stenting
Final angiogram
HEAVY CA++; LCFA Disease
Angio after Shockwave L CFA; no dissection
Final CFA 😊

Final left runoff
(no distal embolization)
CA++ RCIA, RCFA; difficult contralateral access

Shockwave 7X60 RCIA
SEVERE CA++, CFA, PFA, and SFA disease

Poor flow and distal CA++
014 wire in PFA

Shockwave 6X60 SFA AND R CFA
Improved SFA/CFA after Shockwave 6X60

Shockwave 6X60 PFA/CFA
Improved Profunda

Shockwave 7X60 CFA/SFA
Final angios after DCB, one short DES
Bilateral *common iliac* CA++ ~ CTO’s
Crossing CA++ micro-channels with 014 wires right and left
PTA to facilitate IVL

Shockwave IVL LCIA
PTA to facilitate IVL

Shockwave IVL RCIA
Positioning RCA VBX; “Match it” on left

“Kissing” 11 mm VBX’s
Final oblique aortograms
Live Case VIVA 2022

SEVERE symptoms; high risk patient

CTA: 99-100% heavily CA++ infra-renal aorta; ABI’s <4
Wiring CA++ micro-channels with XC 014 wires
Oblique angios, looking at renal proximity

*Measure length of lesion too...*
Protecting L renal for emergent options
2 View Angios to position VBX
VBX stent

NC PTA
Final aortogram
56 year male with multiple co-morbidities; ABI 0.3 bilaterally

CTA: 99-100 DENSPLY Calcified Aorta starting below SMA’s
High risk for open operation; severe IC @ 10 steps; rest pain

Angios with no CFA flow; monophasic SBP 25 mm Hg
Angios of CA++
Aorta from below

Wiring CA++ micro-channels with 014 XC Command ES wire and 018 catheter
Aortogram of peri- and infra-renal CA++ Aortic disease

035 IVUS of aorta
IVUS of Aorta
Peri-renal aorta improved

Infra-renal CA++ Disease
Repeat IVUS

Worsened left renal;
Considering aortic stenting options
Positioning VisiPro L renal stent;
Avoid stent protruding into aorta
Final angio: triphasic iliac pressures, no gradient
Conclusions

• Heavily calcified peripheral lesions present significant challenging procedures with potential for increased risk

• Every patient should be treated with an individualized calcium-specific approach, with often involves adjunctive therapies including lithotripsy angioplasty, atherectomy, non-compliant balloons, covered stent grafts, interwoven stents, distal embolic protection devices, and IVUS
Thank You Very Much for Your Attention!