When DCB is not enough: Is there a need for a new DAART study?

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Disclosure

Speaker name: Thomas Zeller

I have the following potential conflicts of interest to report:

- [x] Consulting
- [ ] Employment in industry
- [x] Stockholder of a healthcare company
- [ ] Owner of a healthcare company
- [ ] Other(s)

- [ ] I do not have any potential conflict of interest
Drug-Coated Balloons

• **Benefits**
  - More uniform drug delivery than drug-eluting stents
  - Native vessel maintained
  - Reduced requirement for DAPT (if stents are avoided)
  - Re-interventions are less challenging than in-stent-restenosis

• **Limitations**
  - Procedural effectiveness, same as POBA
    - Recoil
    - Calcium
    - Dissections
    - Lesion length (?)
  - Increasing bail-out stent rate with increasing lesion length
    - Increases cost
    - May negatively affect procedural outcomes
Calcium May Present a Challenge for DCBs

Calcium

Early data indicate calcium is a barrier to optimal drug absorption\(^1,2\) and a source for acute and subacute vessel recoil.

SFA 12-Month Primary Patency

PTA, BMS, DES and DEF LE Sub-analyses by Lesion Length


9. Matsumura ISET 2012
DAART = Directional Atherectomy + Anti-Restenotic Therapy

- Mechanically re-canalize the vessel without overstretch
- Remove the perfusion barrier
- Reduce the likelihood of bail-out stenting and preserve the native vessel
DEFINITIVE Ca++ demonstrated calcified disease can be treated with DA and embolic protection

- Bail-out stent rate: 4.1%
- Flow-limiting dissection rate: 1.5%
- Achieved maximal lumen gain

Published DAART Data

• Procedure Results
  – < 30% residual stenosis achieved in all cases
  – No procedure-related AEs
  – Bail-out stenting rate: 6.5% (2)

• 1 Year Results
  – Primary Patency (via duplex) = 90% (27/30)
  – Freedom from MAE 87% (26/80)

Authors’ Conclusion: DA and DCB may represent a potential alternative strategy for the treatment of femoro-popliteal severely calcified lesions. These very promising data and the considered hypothesis have to be confirmed in a multicenter randomized trial.
DEFINITIVE AR Pilot Study
Study Design

General and Angiographic Criteria Assessment

Lesion severely calcified?*

NO

Randomization

DAART (n=48)

DCB (n=54)

YES

DAART Severe Ca++ (n=19)

*Defined as: dense circumferential calcification extending > 5 cm
DEFINITIVE AR
1-Year Outcomes

**Duplex Ultrasound Patency at 12 Months**
Emerging Advantage in Long and Severely Calcified Lesions

- **All Patients**: 93.4% DAART, 89.6% DCB
- **Lesions > 10 cm**: 96.8% DAART, 85.9% DCB
- **All Severe Ca++**: 70.4% DAART, 62.5% DCB

**Angiographic Patency at 12 Months**
Angiographic Patency shows similar pattern

- **All Patients**: 82.4% DAART, 71.8% DCB
- **Lesions > 10 cm**: 90.9% DAART, 68.8% DCB
- **All Severe Ca++**: 58.3% DAART, 42.9% DCB

Per Core Lab Assessment. "All Severe Ca++" group includes all patients with severe calcium (including randomized and non-randomized). Results for all patients who returned for angiographic follow-up.
DEF AR – The Value of Luminal Gain

DEF AR Reaffirms the value of luminal gain achieved by DA

What is the Impact of Lumen Gain with DAART?  
Post Procedure MLD (DAART vs DCB alone)

DAART resulted in a significantly larger minimum lumen diameter (MLD) following the protocol-defined treatment in DEFINITIVE AR

12-Month Patency: DAART RCT Patients  
Increased lumen gain with DA before DCB may result in improved 12-month patency

- DUS Patency: 90% N = 20, 77.8% N = 18
- Angiographic Patency: 94.1% N = 17, 68.8% N = 16
DEFINITIVE AR Case Example: DAART Arm sub-optimal debulking

Baseline

59% residual stenosis
Post atherectomy
DEFINITIVE AR Case Example: DAART Arm - sub-optimal debulking

DCB Inflations

34% residual stenosis Post DAART
DEFINITIVE AR Case Example: DAART Arm - Sub-optimal Debulking

Clinically-driven TLR 349 days post DAART procedure
Occlusion begins at site of sub-optimal debulking
SFA-Stent Deployment Evaluation

Stent Compression - Leipzig Data

% MLD 15%

% MLD 42%
DEFINITIVE AR DCB Arm Case Example

severe ca++
DEFINITIVE AR DCB Arm Case Example

severe ca++
DEFINITIVE AR DCB Arm Case Example

severe Ca++

Residual stenosis < 30%
DEFINITIVE AR DCB Arm Case Example

severe Ca++ : 12-Month Angio
Impaired Primary Patency
due to Residual Stenosis following BMS

Residual stenosis
< 30 % (---; △ censored)
> 30% (-----; • censored).

p< 0.05
The Treatment of the Challenging SFA Occlusion with Directional Atherectomy and DCB – Is it Effective?

Conclusions

• Some DEB and DES offer excellent durability in TASC A & B lesions

• However, limitations exist in complex lesion morphologies such as:
  • Lesions ≥10 cm
  • Severely calcified lesions
  • CTOs
  • Acute residual stenosis > 30%

• DEFINITIVE AR resulted by trend in better outcomes in those challenging lesion subsets for the combination of DA & DEB

• A sufficiently powered study to confirm this potential benefit is mandatory
REALITY Study to Evaluate Directional Atherectomy Plus DCB Treatment for PAD

• November 2, 2015—Medtronic plc announced the initiation of the REALITY study to evaluate patient outcomes following adjunctive use of directional atherectomy and drug-coated balloon (DCB) treatment of patients with symptomatic peripheral arterial disease (PAD) in long, calcified superficial femoral (SFA) and/or popliteal artery lesions.

• The study, which will have multidisciplinary representation in leadership, is sponsored and will be managed by VIVA Physicians, Inc.

• The announcement describes the REALITY study is a multicenter, prospective, single-arm observational angiographic and duplex ultrasound core lab–adjudicated study that will enroll 250 patients at up to 20 sites across the United States. Primary patency will be assessed by duplex ultrasound at 12-months. Patients will be followed to 24 months to determine rates of clinically driven target lesion revascularization (CD-TLR).
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