Long Term Results and a Glimpse into the Future with Bioresorbable Scaffolds for BTK?

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Disclosure

Speaker name:

........Ramon L. Varcoe..........................................................

I have the following potential conflicts of interest to report:

- Consulting: Abbott Vascular, Medtronic, Boston Scientific, Intact Medical, Surmodics, Intervene
ALL CURRENT TREATMENT OPTIONS FOR BTK HAVE INHERENT LIMITATIONS

Current Treatment Options for the Tibial Circulation

**Angioplasty**
- Elastic recoil
- Residual plaque
- Restenosis
- Dissection
- Primary patency 20-50% (TASC II)

**Atherectomy**
- Device variability
- Lack of data
- Embolization

**DCBs**
- Elastic recoil
- Residual plaque
- Dissection
- Failed RCTs
- No approved DCB (US)

**BMS**
- Restenosis
- No on-label DES (US)
- Permanent implant
- Short lengths
- Surgical reintervention

**DES**
- No on-label DES (US)
- Permanent implant
- Short lengths
- Surgical reintervention

NIH: Neointimal hyperplasia

To effectively treat BTK disease:

<table>
<thead>
<tr>
<th></th>
<th>Drug (inhibit NIH)</th>
<th>Scaffold (resist recoil)</th>
<th>Leave nothing behind</th>
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<tbody>
<tr>
<td>Angioplasty</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Atherectomy</td>
<td>✗</td>
<td>✗</td>
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<tr>
<td>DCB</td>
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<td>✗</td>
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<tr>
<td>BMS</td>
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<td>✗</td>
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<tr>
<td>DES</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
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A BVS MAY BE THE BEST OF BOTH WORLDS?

• Mechanical Scaffolding
• Drug Delivery
• Potential Return of Normal Vessel Wall Function
• Then Disappears!
Bioresorbable DES for BTK: Long-Term Results & Future Implications

Degrading polymer is replaced by an increasingly cellular provisional matrix.

6 months  12 months  24 months  30 months  36 months  42 months  48 months

ABSORB is currently a non-commercial product and is not available for sale.
• Prospective, Non-Randomised, Single-Center Study

*Inclusion Criteria*
• Chronic lower limb ischemia: RC 3-6
• Life expectancy >1yr
• Single or Multiple De novo lesions; >60%
• Infrapopliteal arteries (distal P3)
• Total Lesion Length ≤5cm (Max 2xBVS)
• Diameters 2.5-4.0mm
TIMELINE

MEDICATION CHECK

PHYSICAL EXAMINATION

RUTHERFORD CLASS

ANKLE BRACHIAL INDEX

DUPLEX ULTRASOUND (PSVR<2.0)

ENDPOINTS

• Binary Restenosis
• Primary Patency

ENDPOINTS

• CD-TLR
• CD-TVR
• **48 Patients**
  - Male:Female 56:44%
  - Mean Age 82yrs (range 65-97yrs)

• **55 Limbs**
  - Left:Right 45:55%
  - CLI:IC 73:27%
• **71 Scaffolds Implanted**
  
  – Target vessels treated
  
  • ATA 15
  • PTA 9
  • PA 15
  • TPT 29
  • P3 2

• **Mean lesion length** 20.1 ±10.8mm (5-50mm)
• 100% Procedural & Technical success
• 18 deaths (38% of cohort) (All Outside 30d)

**Mean Follow-Up**
- 28 months

**Sustained Clinical Improvement**
- 95%

**Assisted primary/secondary patency**
- 100%

**Limb salvage**
- 100%
100% Procedural & Technical success

18 deaths (38% of cohort) (All Outside 30d)

Mean Follow-Up: 28 months

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PRIMARY PATENCY 89.0%

CD-TLR 97.2%

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<th>Patency</th>
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<th>36</th>
<th>24</th>
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<td>SE (%)</td>
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<td>6.2</td>
<td>8.4</td>
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<td>Freedom from TLR</td>
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<td>56</td>
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<tr>
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Patency

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Primary Patency & CD-TLR

- CD-TLR: 97.2%
- Primary Patency: 89.0%
Primary Patency: 89.0%

CD-TLR:
- 97.2%

Freedom from TLR:
- 88.1%

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Aug 2012 pre implantation

Aug 2012 post implantation

Oct 2016 Control Angiogram

BVS
3 x 28
3 x 28
3 x 18

Total Stented Length = 70mm
Progression of disease in non stented vessel

Upper ATA was normal

Disease segment

Progression of disease in the segment of ATA

BVS segment is disease free

Index Angio 2012 (before BVS)

2016
• The First-Gen ABSORB BVS has achieved excellent long-term patency and freedom from TLR rates in the tibial arteries

• This proof-of-concept facilitates the next generation of BVS devices
3 Centre Combined BVS – Preliminary Results

- Consecutive patients treated with the Absorb BVS in hospitals in Singapore, US and Australia
- August 2012 to May 2017
- Inclusion:
  - Rutherford 3-6 CLTI
  - de novo BTK lesions distal popliteal or tibial arteries
  - diameter between 2.5 and 4 mm.
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<th>Demographics (%)</th>
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<tr>
<td>Male</td>
<td>51.2</td>
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<tr>
<td><strong>Rutherford Score</strong></td>
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<tr>
<td>3</td>
<td>15.7</td>
</tr>
<tr>
<td>4</td>
<td>8.7</td>
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<td>5</td>
<td>55.9</td>
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<td>6</td>
<td>19.7</td>
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<tr>
<td><strong>TASC</strong></td>
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<tr>
<td>A</td>
<td>21.3</td>
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<tr>
<td>B</td>
<td>15.7</td>
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<td>C</td>
<td>14.2</td>
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<tr>
<td>D</td>
<td>8.7</td>
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<tr>
<td>NA</td>
<td>43.3</td>
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<tr>
<td>Diabetes</td>
<td>55</td>
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<table>
<thead>
<tr>
<th>Lesion Location (%)</th>
<th>N = 156</th>
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<tr>
<td>P3</td>
<td>5.51</td>
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<tr>
<td>ATA</td>
<td>35.43</td>
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<tr>
<td>TPT</td>
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<tr>
<td>PTA</td>
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<tr>
<td>PA</td>
<td>25.20</td>
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<table>
<thead>
<tr>
<th>Lesion Length (mm)</th>
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<tbody>
<tr>
<td>Mean</td>
<td>25.49</td>
</tr>
<tr>
<td>Min</td>
<td>4.00</td>
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<tr>
<td>Max</td>
<td>88.00</td>
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<table>
<thead>
<tr>
<th>Scaffold (mm)</th>
<th>N = 189</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of scaffolds deployed</td>
<td>189</td>
</tr>
<tr>
<td>Mean Diameter</td>
<td>3.20</td>
</tr>
<tr>
<td>Mean Length</td>
<td>25.5</td>
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</table>
Primary Patency & TLR

**Primary Patency**
- 12 months: 91.1%
- 24 months: 88.6%

**TLR**
- 12 months: 96.6%
- 24 months: 94.5%
Future Implications: ESPRIT-BTK Peripheral Vascular Scaffold

ESPRIT-BTK

- PLLA SCAFFOLD
  - Fully resorbable*
  - Platinum markers for angiographic visualization
  - 99 µm strut thickness†
  - Supports treated artery
  - Allows for uniform delivery of everolimus
  - Resorbs in a benign, controlled manner (~36 mo).

- PDLLA COATING
  - Fully resorbable
  - Conformal coating
  - 1:1 PDLLA: everolimus blend
  - Provides sustained everolimus release to maximize long term patency without downstream particulates

- EVEROLIMUS
  - Cytostatic
  - Patented for restenosis reduction
  - Broad therapeutic range
  - 100 µg/cm² dose density
  - Elution rate matched to restenosis cascade

* Platinum markers as proximal and distal ends remain for angiographic visualization
† ≤ 3.0 mm size; 3.5 – 3.75 mm sizes have 120 µm strut thickness

ESPRIT is currently under investigation and not available for sale.
LIFE-BTK

• pivotal Investigation of safety and efficacy of BRS treatment—Below The Knee

Prospective, randomized multicenter, US and OUS single-blind, trial
225 patients randomized 2:1 ESPRIT™ BTK vs. PTA

Safety Endpoint: MALE+POD
Efficacy Endpoint: Primary Patency+Limb Salvage

5-YEAR FOLLOW-UP

Trial Leadership:
Ramon Varcoe MBBS, MS, FRACS, PhD; Sahil Parikh MD, FACC, FSCAI; Brian DeRubertis MD, FACS,
LIFE-BTK Intended Study Population

- Critical Limb Ischemia, RB 4-5
- Proximal 2/3 of native infrapopliteal vessels
- Max 3 scaffolds in target lesion
- RVD ≥ 2.5 mm and ≤ 3.75 mm
- Max 2 de novo/ restenotic (from prior PTA) infrapopliteal lesions, each with ≥ 70% stenosis
- Max target lesion length: 100 mm; Max total scaffold length among all lesions: 170 mm
ESPRIT-BTK Implantation Technique

Vessel Sizing (Quantitative imaging preferred)

1:1 balloon sizing (Estimate RVD)

Sizing accuracy is imperative for good clinical outcomes

Ideal POBA results Residual <30%

Complete PTA

Vessel Sizing (Quantitative imaging preferred)

Sizing accuracy allows correct scaffold size to be implanted

1:1 balloon sizing (Estimate RVD)

Implant the correct size ESPRIT

Scaffold Implant

ESPRIT-BTK: finishing device

Postdilate

High pressure

Sizing accuracy is imperative for good clinical outcomes
**LIFE-BTK**

- **pivotal Investigation of safety and efficacy of BRS treatment—**
  **Below The Knee**

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