Animal safety study for the SoundBite™ Active Wire

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Disclosure

Speaker name: Martin Brouillete

I have the following potential conflicts of interest to report:

☐ Consulting

☐ Employment in industry

☑ Stockholder of a healthcare company

☑ Owner of a healthcare company

☐ Other(s)

☐ I do not have any potential conflict of interest
Background

• Chronic total occlusions (CTO) are a prevalent condition in today’s population

• Failure to recanalize CTOs remains common and there is a need for the development of new technologies

• SoundBite™ has developed a new guidewire-platform, that acts like a micro-jackhammer, to penetrate and facilitate CTO recanalization
Objective

• Aim of this study was to evaluate the acute and chronic safety of the SoundBite™ Crossing System in a healthy animal model (without CTO)

• Secondary objective was to evaluate the handling of the Active Wire during simulated use
Technology

• SoundBite™ Console (re-usable) + Active Wire (single use)
• Console produces mechanical waves that propagate to the Active Wire’s tip
• Active Wire: size, look and feel = conventional 0.018” CTO guidewires

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Total length</td>
<td>300 cm</td>
</tr>
<tr>
<td>B: Ground section length</td>
<td>16 cm</td>
</tr>
<tr>
<td>C: Distal tip diameter</td>
<td>0.0115”</td>
</tr>
<tr>
<td>D: Wire diameter</td>
<td>0.018”</td>
</tr>
</tbody>
</table>
Mechanism of Action

Micro-jackhammer effect

Effective on hard material

Safe on soft tissue
Methods

Animal model

- Animal model: Hybrid farm pigs, ≈35 kg, healthy, without CTO
- N=4 pigs were used with the Test article (Active Wire 18)
- N=2 pigs were used with the Control article (TruePath)
- Four (4) vessels per animal were exposed to the device (left and right superficial and profundal femoral arteries)

Study design

- GLP animal study
- Each vessel exposed to one device, at a single location, for 2.5 min of activation
- Vital signs monitored during the procedure
- Animals kept alive for 14 days and then sacrificed for necropsy and tissue collection
Methods

Safety endpoints:

• Record of any major adverse events
• Thrombogenicity (*in vivo* via fluoroscopy and visual inspection of the device after the procedure)\(^1\)
• Dissection/perforation (via fluoroscopy)
• Vessel injury\(^2\) (via histopathology of the target vessels)
• Emboli\(^3\) (via fluoroscopy and histopathology of the distal vessels and muscles)
• Hemolysis and inflammation (biomarkers comparison between the test and control group)

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\(^1\) As per NAVI/AVI scoring scheme A Table C.1 of ISO 10993-4

\(^2\) Evaluate and rank (from minimal to severe) the following criteria: (1) endothelial discontinuity, (2) internal elastic lamina rupture, (3) medial devitalization and/or fibrin, (4) medial nuclear atypia, (5) medial disruption, (6) mixed cell infiltration, media and/or adventitia and (7) medial hemorrhage

\(^3\) Histopathological evaluation of downstream muscles and coronary bands to assess the presence of possible event (thromboemboli, foreign material, emboli, etc.). The number of downstream arterioles with possible treatment effect will be given as a percentage of the total number of arterioles.
# Results

<table>
<thead>
<tr>
<th>Safety endpoint</th>
<th>Test article (Active Wire 18)</th>
<th>Control article (TruePath)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major adverse event</td>
<td>No major adverse event</td>
<td>No major adverse event</td>
</tr>
<tr>
<td>Thrombogenicity</td>
<td>No significant thrombosis</td>
<td>No significant thrombosis</td>
</tr>
<tr>
<td>Dissection/perforation</td>
<td>No vessel perforation</td>
<td>Two (2) type-C perforations without further complication</td>
</tr>
<tr>
<td>Vessel injury</td>
<td>No significant vessel injury</td>
<td>No significant vessel injury</td>
</tr>
<tr>
<td>Emboli</td>
<td>No significant emboli</td>
<td>No significant emboli</td>
</tr>
<tr>
<td>Hemolysis blood markers</td>
<td>Similar to control</td>
<td>--</td>
</tr>
<tr>
<td>Inflammation blood markers</td>
<td>Similar to control</td>
<td>--</td>
</tr>
</tbody>
</table>

In addition, handling performance of the Active Wire 18 was judged adequate by the expert operators.
Results – Vessel injury

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>Marked</th>
<th>Moderate</th>
<th>Minimal</th>
<th>No Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEL rupture</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Endothelial discontinuity</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Medial devitalization</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Medial nuclear atypia</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Medial disruption</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Mixed cell infiltration</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Medial hemorrhage</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

- AW with activation (N=12 arteries)
- AW without activation (N=4 arteries)
- TruePath with activation (N=6 arteries)
Conclusion

• The SoundBite™ Crossing System – Peripheral used during this animal study appears to be safe acutely and chronically when compared to the control

• Handling performance of the Active Wire 18 was judged adequate by the expert operators

• Clinical trial recently performed on 52 subjects confirmed the safety profile and efficacy of the SoundBite technology

• SoundBite wishes to thank AccelLAB for their participation in this animal study