Which is Preferable BMS or Zilver Ptx After DCB for ATK Disease?
Safety and Efficacy in the Porcine Model

Aloke Finn, MD
CVPath Institute Inc.
Gaithersburg, MD.
USA
Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Employment in industry: No


Owner of a healthcare company: No

Stockholder of a healthcare company: No
Provisional stenting is mandatory in some cases

<table>
<thead>
<tr>
<th>In.Pact trials</th>
<th>In.Pact SFA(^1)</th>
<th>In.Pact Registry(^2)</th>
<th>In.Pact LL Subgroup (15-25cm)(^3)</th>
<th>In.Pact LL Subgroup (&gt;25cm)(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisional stent rates</td>
<td>7.3%</td>
<td>24.7%</td>
<td>33.3%</td>
<td>52.6%</td>
</tr>
<tr>
<td>Patients</td>
<td>16/220</td>
<td>160/648</td>
<td>33/99</td>
<td>30/57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modern stent trials</th>
<th>Resilient (PTA arm)(^4)</th>
<th>Zilver PTX RCT (PTA arm)(^5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisional stent rates</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>Patients</td>
<td>29/72</td>
<td>120/238</td>
</tr>
</tbody>
</table>

Medicare Part B claims indicate an SFA stent is used in **NEARLY HALF** of all SFA cases in U.S. SFA procedures.\(^6\)

---

2. Ansel, LINC 2015
3. Tepe, LINC 2016
6. Medicare Part B claims indicate an SFA stent is used nearly half of the time. (PSPSF, 2013)
How often is “Leave Nothing Behind” Even Attainable?

DCBs do not reduce the need for a scaffold:
1. Calcium: Hard plaque resists balloon remodeling
2. Dissection: hold flap back for healing
3. Recoil: Significant loss of luminal area

Stents May Be Required in a Fair Number of Cases But Is It Safe and More Efficacious to Use Zilver Ptx After DCB?
# Method of Drug Delivery is Important

<table>
<thead>
<tr>
<th>Parameters</th>
<th>DES</th>
<th>DCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug concentration on the device</td>
<td>Low 3 μg/mm²</td>
<td>Very High 3.5 μg/mm²</td>
</tr>
<tr>
<td>Drug protection in transit</td>
<td>Protected: In sheath</td>
<td>Unprotected: Exposed to friction, fluids</td>
</tr>
<tr>
<td>Drug transfer at the time of deployment</td>
<td>Slow</td>
<td>Rapid, all at once</td>
</tr>
<tr>
<td>Drug transfer time window</td>
<td>7,320 minutes or more</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Diffusion</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Distribution</td>
<td>Uniform, circumferential</td>
<td>Uneven, usually 1 or 2 quadrants</td>
</tr>
</tbody>
</table>

- **NOTE:** Green staining indicates proteoglycans

Sustained Drug Delivery with Even Distribution is Difficult Using DCB Technology

![Images showing BMS, DES, and DCB at 28 days and 14 days (Porcine iliac artery)]
Devices Used in Study:

- DCB = In.Pact Admiral
- DES = Zilver PTX
- BMS = Zilver Bare
Study Design:

Devices Used in Study:
- DCB = In.Pact Admiral
- DES = Zilver PTX
- BMS = Zilver Bare

Yucatan Minipig
What Histological Markers Indicate Efficacy?

- a. Endothelial cell loss
- b. Inter-strut SMC density
- c. Fibrin deposition
- d. Medial SMC Loss (Depth and Circumference)
- e. Medial Proteoglycan/Collagen replacement

![Histological Markers Diagram](image)
Histological Analysis of DCB/BMS, DCB/ZPTX, and POBA/ZPTX in Porcine Superficial Femoral Artery

Key Takeaway: Drug Effects were much less with DCB/BMS versus Zilver Ptx Groups
1-month histological images

**DCB/BMS**

**DCB/ZPTX**

**POBA/ZPTX**

Key Takeaway: Zilver Ptx Groups Had More Evidence of Drug Effect
Histologic findings of emboli/vascular changes following stent implantation

Fibrinoid necrosis in DCB/BMS (left) and DCB/ZPTX (right).

Key Takeaway: Distal emboli were exclusively seen in groups with DCBs
Short Term Efficacy

Conclusion: Zilver PTX most effective

• Irrespective of DCB or POBA, Zilver PTX showed maximum biologic change in neointima/media suggestive of superior drug effect with Zilver PTX.

• Distal emboli were exclusively seen in groups with DCBs, suggesting Zilver Ptx (no associated emboli) is safe.
Study Methods:

Implantation

1-month
n=6 each

3-month
n=6 each

6-month
n=8 each

DCB + BMS

DCB + ZPTX

POBA + ZPTX

Long-term safety

Devices Used in Study:
• DCB = In.Pact Admiral
• DES = Zilver PTX
• BMS = Zilver Bare
Key Takeaway: Vessel Dimensions were within normal limits in all groups indicating DCB/Zilver Ptx was safe. Drug Effects were similar between POBA/Zilver Ptx versus DCB/Zilver Ptx.
Key Takeaway: DCB + Zilver Ptx was as safe as POBA + Zilver PTX in long term follow-up.
Histologic findings of emboli/vascular changes following stent implantation

% Downstream Vascular Changes

Fibrinoid necrosis in DCB/ZPTX at 1-month (left) and 3-month (right).

Key Takeaway: Distal emboli were exclusively seen in groups with DCBs
Zilver PTX + DCB is as safe as Zilver PTX + POBA in long-term swine model.

**Long-Term Safety Study** Conclusion: ZPTX + DCB safe
Efficacy:

- Zilver PTX + DCB or POBA showed greater desired biologic effect as compared to BMS + DCB.
  - In lesions with evidence of vessel dissection, prolapse, or angiographic unacceptable results following DCB usage, Zilver PTX should be used rather than BMS.

Safety:

- Zilver PTX + DCB is as safe as Zilver PTX + POBA
- Distal emboli are only observed with DCB and not with Zilver PTX
Which is Preferable BMS or Zilver Ptx After DCB for ATK Disease?
Safety and Efficacy in the Porcine Model

Aloke Finn, MD
CVPath Institute Inc.
Gaithersburg, MD.
USA