How Can ISR Be Classified and What Is Currently The Best Treatment For Each Class?

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In-Stent Restenosis
Treatment Options

- Plain Old Balloon Angioplasty
- Cutting/scoring balloon
- Laser Atherectomy
- Directional Atherectomy
- Re-stent (Bare metal)
- Stent-graft
- Drug-coated balloon
- Drug-eluting stent

ISR-What We Know So Far

- POBA alone is not adequate.
- Occluded stent → Bad
- Debunking probably will have a role but it is not clear which patients will benefit.
- Drug mediated therapy shows promise.

Successful FP stenting (138 patients, 915 limbs)
Repeat angioplasty for ISR (137 patients, 157 limbs)

Treatment for In-stent Restenosis

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Patency 12m</th>
<th>Reference</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTA</td>
<td>28-38%</td>
<td>Krankenberg Circ 2015</td>
<td>Depends upon number of Class III patients</td>
</tr>
<tr>
<td>Cutting</td>
<td>Same as PTA</td>
<td>Dick Radiol 2008</td>
<td>Lack data on other modified balloons</td>
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<tr>
<td>Atherectomy</td>
<td>43-54%</td>
<td>Zeller JACC 2006</td>
<td>Schmidt JEVT 2014 Possible combination with DCB</td>
</tr>
<tr>
<td>Stent-graft</td>
<td>62-75%</td>
<td>Monahan JVS 2011</td>
<td>Available data with Viabahn</td>
</tr>
<tr>
<td>DCB</td>
<td>71-92%</td>
<td>Saini JACC 2012</td>
<td>Liistro JEVT 2014 Small series</td>
</tr>
<tr>
<td>DES</td>
<td>79-80%</td>
<td>Duke UNC 2014</td>
<td>Zeller JACC 2013 Registry data</td>
</tr>
</tbody>
</table>

Balloon Angioplasty for SFA ISR
Freedom from Recurrent Restenosis
Freedom from Re-occlusion due to ISR

SFA In-Stent Restenosis
POBA Alone is Not Adequate

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Lesion length</th>
<th>Primary Patency at 12 months</th>
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</thead>
<tbody>
<tr>
<td>RELINE</td>
<td>44</td>
<td>19 cm</td>
<td>28.0%</td>
</tr>
<tr>
<td>FAIR</td>
<td>57</td>
<td>8 cm</td>
<td>37.5%</td>
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ISR Lesion Length

DCB for ISR
Montevergine Registry

DEB vs PTA for ISR
DEBATE ISR Study

DEB vs PTA for ISR
FAIR Trial

Prospective RCT
POBA vs IN.PACT DEB

Recurrent restenosis:
8/41 (19.5%) after DEB
28/39 (71.8%) after PTA

Krankenberg et al. J Endovasc Ther 2015;22:1

Stabile et al. JACC 2012;60:1739
ISR Lesion Length

Primary Patency 12 months
Lesion length mm

Zilver PTX
Zeller et al. JACC Cardiovasc Interv 2013
140 133 mm 78.8%
36 131 mm 83.8%

Debulking for ISR
• Potential advantages:
  • Better angiographic and hemodynamic result
  • Lumen enhancement
  • Remove thrombus within stent

Which patients?
Occlusion
Prior to re-line
Small artery
Long segment

ISR Treatment
Conclusions
• Lesion length and occlusion are both important and must be considered.
• Focal lesions: DCB
• Long lesions: Debulk plus DCB
• Long occlusions: Debulk plus re-line
• Multiple failures or lost runoff: surgery