Graft interventions

Tips και tricks

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Vein Grafts Don’t Last as Long as Arterial Grafts
### SVG Occlusion Rates from Surgical Studies

<table>
<thead>
<tr>
<th>Trial</th>
<th>One Year SVG occlusion rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRAGUE-4 On-pump</td>
<td>41% (per patient)</td>
</tr>
<tr>
<td>PRAGUE-4 Off-pump</td>
<td>51% (per patient off-pump)</td>
</tr>
<tr>
<td>PREVENT IV</td>
<td>41.7% (per patient); 26.6 (per SVG)</td>
</tr>
<tr>
<td>RIGOR</td>
<td>31% (per patient); 19% (per SVG)</td>
</tr>
<tr>
<td>ROOBY On-pump</td>
<td>28.7% (per patient on-pump)</td>
</tr>
<tr>
<td>ROOBY Off-pump</td>
<td>36.5% (per patient off-pump)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Trial</th>
<th>5 yr SVG occlusion rates</th>
<th>10 yr SVG occlusion %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitzgibbon et al</td>
<td>25% (per SVG)</td>
<td>40% (per SVG)</td>
</tr>
<tr>
<td>Goldman et al</td>
<td>31% (per patient)</td>
<td>39% (per patient)</td>
</tr>
</tbody>
</table>
Pathobiology of SVG

Friable, degenerated atheromatous and thrombotic debris that develop when SVGs deteriorate

↓

Distal Debris Embolization ------- Chemical Embolization

↓

Slow or No- Reflow Phenomenon (10% to 15% of cases)

↓

Myocardial infarction (31% of patients)

↓

In – Hospital Mortality increases 10-fold

Distal embolization remains difficult to predict

Higher restenosis / occlusion rates than native coronaries
Predictors of 30-day and 1 Year MACE After SVG Intervention

- Lesion length
- SVG Degeneration score
- Larger plaque volume
- Female Sex
- Chronic renal insufficiency (serum creatinine >1.5 mg/dl)
- Degree of CK-MB elevation after SVG-PCI
- Disease progression at untreated intermediate lesions

Technical Aspects

• Antithrombotics
• Direct Stenting
• Covered stents
• DES
• Embolic Protection Devices
• Other Issues
Antithrombotics in SVG - PCI

- GpIIb/IIIa blockers:
  - No large RCTs
  - Subset analysis show no ↓ in periprocedural MI
  - One study showed better procedural success, but no impact on 30-day mortality

- Bivalirudin: One retrospective study showed lower enzyme elevation, NQMI & repeat procedures
  - In ACUITY trial: outcomes similar but minor bleeds were less
Direct stenting:
Potential benefit of trapping debris & less distal embolization

Registry data
– Less overall CK-MB elevations
– Fewer NSTEMIs with Direct stenting

• Predilatation is inevitable in some cases of chronic degenerated graft lesions which are hard and calcific
• Rotablation deemed overly risky & not recommended
Direct Stenting
Direct Stenting
Direct Stenting
Direct Stenting
SVG Intervention Techniques: BMS or Covered Stents

In principle should be associated with less embolizations & periprocedural complications

SYMBIOT
JoSTENT
AneurX
MGuard

Typically no advantage in terms of MACE rates and slightly higher restenosis/TVR rates.
Hence, no evidence to suggest covered stents are better
# SVG Intervention Techniques BMS v/s DES

<table>
<thead>
<tr>
<th>Trial</th>
<th>SOS</th>
<th>RRISC</th>
<th>ISAR-</th>
<th>CABG</th>
</tr>
</thead>
<tbody>
<tr>
<td>(%)</td>
<td>PES</td>
<td>BMS</td>
<td>SES</td>
<td>BMS</td>
</tr>
<tr>
<td>MACE</td>
<td>37</td>
<td>49</td>
<td>15.8</td>
<td>29.7</td>
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<tr>
<td>Death</td>
<td>12</td>
<td>5</td>
<td>2.6</td>
<td>0</td>
</tr>
<tr>
<td>MI</td>
<td>15</td>
<td>31</td>
<td>2.6</td>
<td>0</td>
</tr>
<tr>
<td>TLR</td>
<td>5</td>
<td>28</td>
<td>5.3</td>
<td>21.6</td>
</tr>
</tbody>
</table>

- Most large RCT’s have 10-15% SVG cases
- Few small but well conducted RCT’s specific to SVGs
- DES Better Than BMS

One Year Outcomes
Similar results seen in 3 & 5 yr data where available

SOS: Stenting in Saphenous Vein Grafts
RRISC: Reduction of Restenosis in SVG’s with Cypher
Embolic Protection Devices

- Perhaps the best way to prevent distal embolization
  Proximal: Balloon occlusion
  Distal: Filters or balloon occlusion
Embolic Protection Devices
Embolic Protection Devices
Embolic Protection Devices
Embolic Protection Devices
Embolic Protection Devices
Treatment of Occluded SVGs

- Low successful recanalization
- High in-stent restenosis (68%)
- High target vessel revascularization (61%)
- Treat acute occlusions in the setting of myocardial infarction.
- Recanalize the native coronary artery if feasible
Treatment of Occluded SVGs
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Treatment of Occluded SVGs in AMI
Treatment of Occluded SVGs in AMI
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Treatment of Occluded SVGs in AMI
Other Issues

• Undersized stents said to reduce distal embolization
  – Theoretically higher risk of restenosis and stent thrombosis?

• Pharmacotherapy to prevent No-reflow
  – NTG/SNP/Adenosine/Verapamil

• Use of FFR – Similar hemodynamic information as native coronaries

• Borderline lesions: VELETI trial (30-60% stenoses treated with lower 1- & 3 yr MACE rates!)
Conclusions

• Venous graft lesions account for a 1-10% of PCIs

• Pathology of graft degeneration makes SVG PCI technically challenging

• Careful use of drugs and devices can minimize complications

• Small tips and tricks are important for high success rates
Thank you for your Attention