Sutureless Valves

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Disclosures: none
## AVR Indications

<table>
<thead>
<tr>
<th>Class</th>
<th>Level</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>B</td>
<td>AVR is indicated in patients with severe AS and any symptoms related to AS.</td>
</tr>
<tr>
<td>I</td>
<td>C</td>
<td>AVR is indicated in patients with severe AS undergoing CABG, surgery of the ascending aorta or another valve.</td>
</tr>
<tr>
<td>IIA</td>
<td>C</td>
<td>AVR should be considered in patients with moderate AS undergoing CABG, surgery of the ascending aorta or another valve.</td>
</tr>
<tr>
<td>IIA</td>
<td>B</td>
<td>AVR should be considered in high risk patients with severe symptomatic AS who are suitable for TAVI but in whom surgery is favoured by a &quot;heart team&quot; based on the individual risk profile and anatomic suitability.</td>
</tr>
<tr>
<td>IIA</td>
<td>C</td>
<td>AVR should be considered in symptomatic patients with low flow, low gradient (&lt;40 mmHg) AS with normal EF only after careful confirmation of severe AS.</td>
</tr>
<tr>
<td>IIA</td>
<td>C</td>
<td>AVR should be considered in symptomatic patients with severe AS, low flow, low gradient with reduced EF, and evidence of flow reserve.</td>
</tr>
<tr>
<td>IIb</td>
<td>C</td>
<td>AVR may be considered in symptomatic patients with severe AS low flow, low gradient, and LV dysfunction without flow reserve.</td>
</tr>
</tbody>
</table>

Guidelines ESC-EACTS 2012
AVR Risks

- Even AVR is a low risk procedure ... (1-3% Mortality)
- Low EF -> High risk mortality (increase -10%)
- Age over 80 -> 6.5% mortality
Treatment options

- 1. Traditional surgical AVR with bioprosthesis or mechanical valves

- 2. Percutaneous or transapical implant (TAVI)

- 3. Sutureless valves or fast deployment (Perceval or Intuity)
Aortic Cross Clamp Time risks

- 3000 pz. Aortic cross clamp time is an independent morbidity predictor.
- Risk increases 1.4% per minute of aortic cross clamp.
- Higher risk in patients with EF ≤ 40% and/or diabetes.

Ranucci et al. Aortic Cross-Clamp Time, New Prosthese and Outcome in Aortic Valve Replacement. The Journal of Heart Valve Disease 2012; 21 732-739
## MICS vs. Traditional Surgery

<table>
<thead>
<tr>
<th></th>
<th>Doll <em>et al</em></th>
<th>Bakir <em>et al</em></th>
<th>Hiraoka <em>et al</em></th>
<th>Lamelas <em>et al</em></th>
<th>Korach <em>et al</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortalità</strong></td>
<td>3 vs 9</td>
<td>2.6 vs 4.4</td>
<td>2.7 vs 1.9</td>
<td>1.7 vs 9.5</td>
<td>2 vs 2</td>
</tr>
<tr>
<td><strong>Infezioni</strong></td>
<td>2 vs 2</td>
<td>0.9 vs 0.7</td>
<td>2.7 vs 1.9</td>
<td>6 vs 0.8</td>
<td>0 vs 1.3</td>
</tr>
<tr>
<td><strong>Reintervento per</strong></td>
<td>7 vs 9</td>
<td>7.8 vs 6.2</td>
<td>0 vs 0.9</td>
<td>6 vs 6.7</td>
<td>2 vs 2</td>
</tr>
<tr>
<td><strong>sanguinamenti</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td>6 vs 5</td>
<td>2.1 vs 0.7</td>
<td>0 vs 0</td>
<td>4.8 vs 3.4</td>
<td>2 vs 0.6</td>
</tr>
<tr>
<td><strong>Insufficienza</strong></td>
<td>3 vs 10</td>
<td>0.4 vs 1.4</td>
<td>n.d</td>
<td>19 vs 38</td>
<td>n.d</td>
</tr>
<tr>
<td><strong>respiratoria/prolungata</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ventilazione meccanica</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Insufficienza</strong></td>
<td>n.d</td>
<td>3.4 vs 5.1</td>
<td>n.d</td>
<td>0.8 vs 16.7</td>
<td>n.d</td>
</tr>
<tr>
<td><strong>renale</strong></td>
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Sutureless benefits

- Sutureless valves allows AVR without suturing
- Simplify the procedure
- Low aortic cross-clamp time
- Low cardiac ischemia time
- Lower mortality

- Minimally invasive surgical techniques (ministernothomy and minithoracothomy)
- Concomitant procedures (e.g. coronary bypass)
- High risk patients with comorbidities
Time saving

Find out more:
2. Phan et al., Ann Cardiothorac Surg 2225-319X.2014.06.01
Better Patient Outcome

ICU stay reduction

Days (means)

Traditional sutured: 2.8
Perceval: 1.9
Better Patient Outcome

Ventilation time reduction\(^1\)

- Traditional sutured: 15 hours
- Perceval: 9.2 hours
Better Patient Outcome

Less blood transfusion\(^1\)

![Bar chart showing blood units (means) for traditional suturing and Perceval]

Blood units (means)

- Traditional sutured: 2.3
- Perceval: 1.1

Find out more:
Optimize blood flow

Find out more:
1. Shrestha et al., Interactive CardioVascular and Thoracic Surgery (2013) 1-5
Sutureless INDICATIONS

- AVR alone
- Minimally invasive AVR
- Combined surgery (bypass)
- Low EF (<40%)
- Diabetes
- Multiple risk factors pts (age, diabetes, LVEF <40%, Acute or Chronic Kidney Insufficiency)
- Anatomical skills (small aorta, small annulus)
- Calcified aorta


Perceval S Images

Perceval S- valve
• Perceval S – collapsed for the inserction

• Perceval S – flow
Valve Collapse

Collapsing, not crimping

Examination of the results after collapsing and deployment revealed optimal cusp coaptation and absence of tears, perforation or folding.²

Source: M. Della Barbera SHVD 2011 poster presentation

Collapsing:
- Increases the visibility
- Allows easier procedure
- Preserves the integrity of the leaflets

Pericardial Cusps: scanning electron microscopy, Elastic Van Gieson and Sirius Red stain at polarized light: collagen waviness in control and at different times of collapse
• Perceval S – alignment in aorta

• Perceval S – seat in aorta
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Thank you

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