Methods: 85 consecutive patients with severe AS underwent BAV. The prognostic effectiveness of a new Zva index ratio, defined as the ratio of the post-BAV Zva to the pre-BAV Zva (post-Zva/pre-Zva), for 6-month endpoint event was evaluated in patients not eligible for surgical valve replacement. Central systolic arterial pressure (averaged from at least 3 measurements), mean transvalvular pressure gradient and stroke volume index were obtained using invasive measurements.

Results: The postZva/preZva index ratio is a good predictor for 6-month endpoint event. A cutoff value <0.85 was strongly associated with poor survival at 6 months. Zva-derived measurements were similar between both groups with postZva/preZva <0.85 and ≥0.85.

Invasive Hemodynamic and Clinical Variables Stratified by Valvuloarterial Impedance Index Ratio

TCT-757

A new transcatheter aortic valve design with enhanced durability: prototype design, fabrication and hydrodynamic testing results

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Background: As the application of transcatheter aortic valve (TAV) implantation moves towards intermediate or low risk patients, TAV durability will be a greater concern. Current TAVs employ thin tissue leaflets, have limited or no stent-tip deflection, and often exhibit “pinwheeled” leaflets due to abnormal deployment. These factors are known to increase stress and limit the durability of surgical pericardial valves. In this study, we present an elegant leaflet design of TAVs with chordal reinforcement (Chord-TAVs) that can mitigate leaflet stress concentrations and enhance overall valve durability.

Methods: Optimal designs of Chord-TAVs were obtained through computational modeling. Chord-TAVs were fabricated from glutaraldehyde-treated thin bovine pericardium sewn onto size 23 woven nitinol stents. The leaflet strain distributions of Chord-TAVs were measured from a static pressurization test. The physical design, fabrication and hydrodynamic testing results

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Conclusions: Chord-TAV strain distribution was up to 42% lower than for fabricated chordless valves. Chord-TAVs exhibited satisfactory hydrodynamics for size 23 valves. Initial AWT testing data indicated that strain reduction continues following cyclic loading (Fig.1).

TCT-758
Age Alone Should Not Preclude Surgery: Contemporary Outcomes after Aortic Valve Replacement in Nonagenarians
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Background: A strong component of predicted mortality in scoring systems is age. Advanced age, however, outcomes data in nonagenarians (age >90 years) is lacking. We evaluated surgical outcomes after aortic valve replacement (AVR) in nonagenarians at our institution over an 11-year period.

Methods: Demographics, procedural details, and in-hospital outcomes were retrospectively analyzed on 119 patients with severe aortic stenosis (AS) who underwent AVR or AVR+concomitant surgery between 2001 and 2012. Mean duration of follow-up was 91.5±183 days.

Results: The average age was 91.7±1.9 years (range 90-97) and mean STS score was 8.9±5.7. Over 98% of patients met echocardiographic criteria for severe AS (mean gradient 45.0±16.1 mmHg, aortic valve area 0.66±0.2 cm2), had an ejection fraction of 49.8±11.8%, and 47% underwent an isolated AVR. Though average length of stay was longer than expected, rates of prolonged ventilation (16.8%), new atrial fibrillation (43.7%), stroke (0.8%), and renal failure (5.9%) were acceptable. Three patients (2.5%) required reoperation for bleeding. Overall 30 day or in-hospital mortality was 7.6%, and multivariate predictors of mortality at 1 year included prior myocardial infarction (HR 2.79, 95% CI: 1.21-6.45, p=0.016), obstructive lung disease (HR 3.90, 95% CI: 1.66-9.15, p=0.025), and diabetes (HR 2.77, 95% CI: 1.08-7.07, p=0.033). Observed mortality at 30 days was lower than expected (observed/expected = 0.85).

Table 1. Demographics and Procedural Outcomes

<table>
<thead>
<tr>
<th>Concomitant surgery status, n (%)</th>
<th>Isolated AVR</th>
<th>AVR+ CABG</th>
<th>AVR + MVR</th>
<th>AVR + Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>56 (47.1%)</td>
<td>47 (39.5%)</td>
<td>10 (8.4%)</td>
<td>6 (5.0%)</td>
</tr>
<tr>
<td>Isolated AVR</td>
<td>13.9±9.1</td>
<td>18.7±13.2</td>
<td>16.1%</td>
<td>25.4%</td>
</tr>
</tbody>
</table>

Conclusions: Excellent procedural and long-term outcomes can be achieved in nonagenarians, and age alone should not be a contraindication for valve replacement in select populations. This sample cohort validates the feasibility of a primary operative strategy in elderly patients with AS and acceptable risk profiles.

TCT-759
Correlates for Device Malposition during Aortic Valve-in-Valve Implantation: Insights from the Global Valve-in-Valve Registry
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Background: The incidence of transcatheter heart valve (THV) device malposition is higher during aortic valve-in-valve implantation (VivA). We aimed to evaluate for covariates for this complication.

Methods: Aortic VivA procedures were investigated (459 procedures, 246 Edwards SAPIEN and 213 CoreValve). Results: THV device malposition occurred in 50 cases (10.9%) resulting in attempted device retrieval (10.3%) or need for a second THV device implantation (7.5% CoreValve vs. 4.1% Edwards SAPIEN, p=0.052). Device malposition was more common during CoreValve VivA procedures (16.4% vs. 6.1%, Edwards SAPIEN, p=0.0004). In Edwards SAPIEN VivA procedures there was no difference in malposition rate between transfemoral and transapical procedures (4.1% vs. 7%, p=0.39). Device malposition was more common in procedures performed early in the learning-curve (14.4% vs. 9% after the seventh case per center, p=0.046), with regurigitant bioprostheses (13.3% vs. 7.2% in bioprostheses with isolated stenosis, p=0.04) and with stentless and Mosaic stented valves (16.1%/14.0% vs. 9.0% in non-Mosaic stented valves, p=0.04).

Conclusions: Device malposition is common during aortic VivA procedures and may result implantation of a second THV device. Malposition was more common when performed early in the learning curve, with CoreValve VivA procedures and with regurigitant, stentless and Mosaic bioprostheses.

TCT-760
All-Cause Mortality after Surgical or Trans-Catheter Aortic Valve Replacement in Patients with Low-Flow Low-Gradient Aortic Stenosis
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Background: Low-Flow Low-Gradient (LF-LG) or ‘Paradoxical Aortic Stenosis’ is a rarely encountered clinical entity with limited data on clinical outcomes after surgical (SAVR) or transcatheter aortic valve (TAVI) replacement. We conducted a meta-analysis of all the studies comparing all-cause mortality after aortic valve replacement in LF-LG AS in comparison to medical therapy alone.

Methods: A thorough PubMed (time-unlimited till 06/01/2013) search revealed 5 studies comparing TAVI/SAVR outcomes in LF-LG aortic stenosis (mean gradient <40mmHg; stroke volume index <35ml/m2). Primary clinical endpoint was all-cause mortality at 2 year follow-up. Odds ratio (OR) and confidence interval (CI) were estimated using the random effects model.

Results: A total of 607 patients (SAVR/TAVI 263; medical therapy 344) were included in the analysis. Baseline characteristics of these patients in valve replacement and medical therapy arms were comparable. At 2-year follow-up, SAVR/TAVI was associated with lower all-cause mortality (24.3% vs. 55.8%; OR 0.23; 95% CI 0.15 – 0.36). This corresponds to an absolute risk reduction of 31.5% and a Number Needed to Treat 3.55 to save one life.

Conclusions: Excellent procedural and long-term outcomes can be achieved in nonagenarians, and age alone should not be a contraindication for valve replacement in select populations. This sample cohort validates the feasibility of a primary operative strategy in elderly patients with AS and acceptable risk profiles.