**Impact of valvular resistance on aortic regurgitation after transcatheter aortic valve replacement according to the type of prosthesis**

***Supplementary materials***

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**Supplementary Table 1.** **Computed tomography assessments in comparison between HVR and LVR**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 　 | Overall | LVR | HVR | p Value |
| N=551 | N=263 | N=288 |
| **Aortic valve apparatus** |  |  |  |  |
| Maximum annulus diameter, mm | 27.2±2.5 | 27.7±2.4 | 26.8±2.5 | <0.001 |
| Minimum annulus diameter, mm | 20.7±2.1 | 21.2± 2.1 | 20.3±2.0 | <0.001 |
| Mean annulus diameter, mm | 24.0±2.1 | 24.5±2.1 | 23.5±2.0 | <0.001 |
| Annulus area, mm2 | 446.6±76.9 | 464.9±78.4 | 429.9±71.8 | <0.001 |
| Annulus perimeter, mm | 76.2±6.5 | 77.7±6.6 | 74.8±6.2 | <0.001 |
| Left coronary height, mm | 14.6±3.5 | 15.0±3.6 | 14.3±3.4 | 0.02 |
| Right coronary height, mm | 17.5±3.3 | 17.9±3.1 | 17.0±3.3 | 0.001 |
| Ascending aorta, mm | 33.1±3.2 | 33.2±3.0 | 33.0±3.4 | 0.34 |
| Sinotublar junction, mm | 27.7±3.1 | 28.4±3.1 | 27.0±2.9 | <0.001 |
| Sinus of valsalva, mm | 33.2±3.9 | 33.6±3.8 | 32.8±3.8 | 0.01 |
| LVOT, mm | 23.6±3.1 | 24.0±3.2 | 23.3±3.0 | 0.009 |
| Annulus eccentricity | 0.76±0.06 | 0.77±0.06 | 0.76±0.07 | 0.26 |
| AVC calcium volume (Total), mm3 | 322.2±308.4 | 270.7±261.9 | 369.3±339.1 | <0.001 |
| LVOT calcium volume (Total), mm3 | 15.3±38.2 | 13.0±37.0 | 17.4± 39.2 | 0.18 |

Values are mean ± standard deviation where appropriate.

AVC = aortic-valvar complex; LVOT = left ventricular outflow tract.

**Supplementary Table 2. Complications during the intervention**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 　 | Overall | **Balloon-expandable valve** |  | **Self-expandable valve** |
| LVR | HVR | p Value |  | LVR | HVR | p Value |
| N = 708 | N = 176 | N = 147 | 　 | N = 178 | N = 207 |
| Annulus rupture or aortic dissection, n (%) | 1 (0.2) | 0 (0.0) | 1 (1.1) | 0.39 |  | 0 (0.0) | 0 (0.0) |  |
| Valve embolization, n (%) | 1 (0.1) | 1 (0.6) | 0 (0.0) | 1.00 |  | 0 (0.0) | 0 (0.0) |  |
| Coronary artery occlusion, n (%) | 3 (0.6) | 0 (0.0) | 1 (1.1) | 0.39 |  | 1 (0.8) | 1 (0.9) | 1.00 |
| Conversion to SAVR, n (%) | 3 (0.4) | 0 (0.0) | 0 (0.0) |  |  | 1 (0.6) | 2 (1.0) | 1.00 |
| Valve in series, n (%) | 13 (1.8) | 1 (0.6) | 0 (0.0) | 1.00 |  | 5 (2.8) | 7 (3.4) | 0.78 |

Values are means ± standard deviations or counts (percentages %).

SAVR, surgical aortic valve replacement.

**Supplementary Table 3a. Predictor for moderate or greater post-TAVR AR in patients with balloon-expandable valve**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Univariable analysis |  | Multivariable analysis |
| OR (95% CI) | p Value |  | Adj.OR (95% CI) | Adj.p Value |
| VR ≥238 | 2.25 (0.74-6.86) | 0.16 |  | 2.19 (0.71-6.71) | 0.17 |
| Transapical access | 2.55 (0.86-7.60) | 0.09 |  | 2.48 (0.83-7.43) | 0.10 |
| COPD | 0.95 (0.21-4.38) | 0.95 |  |  |  |
| BMI ≤20 kg/m2 | 2.07 (0.44-9.79) | 0.36 |  |  |  |
| Atrial fibrillation | 0.64 (0.17-2.35) | 0.50 |  |  |  |
| Age (years) | 0.98 (0.90-1.07) | 0.67 |  |  |  |
| Female | 0.75 (0.25-2.21) | 0.60 |  |  |  |
| History of CVEs | 1.15 (0.25-5.33) | 0.86 |  |  |  |
| STS-PROM score | 1.01 (0.89-1.14) | 0.91 |  |  |  |
| Creatinine >200 μmol/L | 1.24 (0.15-10.0) | 0.84 |  |  |  |
| Peripheral artery disease | 1.88 (0.57-6.22) | 0.30 |  |  |  |
| Diabetes mellitus | 0.80 (0.24-2.60) | 0.71 |  |  |  |

Multivariable model includes stepwise variables if the p-value of entry was <0.2: one patient with missing post-TAVR AR data was not included in the analysis. Single imputation of missing values: creatinine (n=1, assumed ≤200), COPD (n=1, assumed no).

AR, aortic regurgitation; BMI, body mass index; COPD, chronic obstructive pulmonary disease; CVEs, cerebrovascular events; STS-PROM, Society of thoracic surgeons-Predicted Risk Of Mortality; TAVR, transcatheter aortic valve replacement; VR, valvular resistance.

**Supplementary Table 3b.** **Predictor for moderate or greater post-TAVR AR in patients with self-expandable valve**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Univariable analysis |  | Multivariable analysis |
| OR (95% CI) | p Value |  | Adj.OR (95% CI) | Adj.p Value |
| VR ≥238 | 2.22 (1.15-4.30) | 0.02 |  | 2.42 (1.22-4.80) | 0.01 |
| COPD | 2.12 (1.03-4.38) | 0.04 |  | 2.36 (1.10-5.05) | 0.03 |
| BMI ≤20 kg/m2 | 2.52 (1.11-5.73) | 0.03 |  | 2.37 (1.00-5.63) | 0.051 |
| Diabetes mellitus | 0.38 (0.15-1.00) | 0.05 |  | 0.39 (0.14-1.07) | 0.07 |
| Coronary artery disease | 0.40 (0.12-1.35) | 0.14 |  | 0.33 (0.10-1.14) | 0.08 |
| Atrial fibrillation | 1.46 (0.78-2.71) | 0.24 |  | 1.61 (0.84-3.08) | 0.15 |
| Age (years) | 1.00 (0.94-1.06) | 0.98 |  |  |  |
| Female | 0.82 (0.45-1.52) | 0.53 |  |  |  |
| History of CVEs | 1.69 (0.66-4.33) | 0.28 |  |  |  |
| STS-PROM score | 1.04 (0.98-1.09) | 0.17 |  |  |  |
| Peripheral artery disease | 1.24 (0.55-2.81) | 0.61 |  |  |  |
| Creatinine >200 μmol/L | 1.62 (0.34-7.76) | 0.54 |  |  |  |

Multivariable model includes stepwise variables if the p-value of entry was <0.2: one patient with missing post-TAVR AR data was not included in the analysis. Single imputation of missing values: creatinine (n=1, assumed ≤200), COPD (n=1, assumed no).

AR, aortic regurgitation; BMI, body mass index; COPD, chronic obstructive pulmonary disease; CVEs, cerebrovascular events; STS-PROM, Society of thoracic surgeons-Predicted Risk Of Mortality; TAVR, transcatheter aortic valve replacement; VR, valvular resistance.

**Supplementary Table 4.** **Predictor of moderate or greater post-TAVR AR in patients with CT measurements**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Univariable analysis |  | Multivariable analysis |
| OR (95% CI) | p Value |  | Adj.OR (95% CI) | Adj.p Value |
| VR ≥238 | 2.39 (1.25-4.56) | 0.008 | 　 | 2.30 (1.12-4.71) | 0.02 |
| Use of Self-expandable valve | 3.34 (1.63-6.86) | 0.001 | 　 | 3.62 (1.73-7.58) | 0.001 |
| BMI ≤20 kg/m2 | 3.12 (1.45-6.74) | 0.004 | 　 | 3.09 (1.33-7.18) | 0.009 |
| Female | 0.86 (0.48-1.55) | 0.62 | 　 | 0.56 (0.28-1.11) | 0.10 |
| Pre-dilatation | 2.12 (0.83-5.43) | 0.12 | 　 | 2.29 (0.87-6.01) | 0.09 |
| AVC calcium total per 100mm³ | 1.11 (1.02-1.20) | 0.01 |  | 1.03 (0.93-1.14) | 0.56 |
| LVOT calcium total per 100mm³ | 1.99 (1.15-3.44) | 0.01 |  | 1.75 (0.91-3.39) | 0.10 |
| Diabetes mellitus | 0.40 (0.16-0.95) | 0.04 | 　 | 　 | 　 |
| Peripheral artery disease | 1.39 (0.66-2.90) | 0.38 | 　 | 　 | 　 |
| COPD | 2.25 (1.14-4.47) | 0.02 | 　 | 　 | 　 |
| Atrial fibrillation | 1.16 (0.62-2.18) | 0.64 | 　 | 　 | 　 |
| Age (years) | 1.00 (0.95-1.06) | 0.88 | 　 | 　 | 　 |
| History of CVEs | 1.85 (0.82-4.17) | 0.14 | 　 | 　 | 　 |
| Coronary artery disease | 0.91 (0.49-1.67) | 0.76 | 　 | 　 | 　 |
| STS-PROM score | 1.05 (0.99-1.13) | 0.12 | 　 | 　 | 　 |
| Creatinine >200 μmol/L | 1.78 (0.39-8.18) | 0.46 | 　 | 　 | 　 |

Multivariable logistic regression models include variables included stepwise if the p-value of entry was <0.1.

AVC, aortic-valvar complex; AR, aortic regurgitation; BMI, body mass index; COPD, chronic obstructive pulmonary disease; CVEs, cerebrovascular events; LVOT, left ventricle outflow tract; STS-PROM, Society of thoracic surgeons-Predicted Risk Of Mortality; TAVR, transcatheter aortic valve replacement; VR, valvular resistance.

One patient with missing post-TAVI AR are not in these analyses. Single imputation of missing values: creatinine (n=1 assumed ≤200), COPD (n=1 assumed no).