

LV Hypertrophy and Geometry Playground in TAVI Patients: From Pressure to Volume Overload

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Introduction:

Myocardial hypertrophy and remodeling process have different patterns based on the timing and nature of the provocative stimulus. Both pressure and volume overload are associated with a compensatory increase in LV mass, the pattern of hypertrophy is distinct in each case. We try to investigate impact of aortic regurgitation in previous severe aortic stenosis in patients after transcatheter aortic valve implantation (TAVI).

Methods:

Consecutive patients with symptomatic, severe, and calcified aortic valves stenosis (aortic valve area ≤ 1 cm²) and an excessive risk for surgical aortic valve replacement were referred to our department for TAVI. Two groups are formed based on level of aortic regurgitation, less than moderate AR (AR < 2+) and moderate or more AR (AR $\geq 2+$). Timeline of left ventricular mass index, relative wall thickness and left ventricular end-diastolic diameter were evaluated baseline, month and year after valve implantation using ANOVA with post-hoc test for repeated measures.

Results:

Out of 134 patients, a total of 76 were identified with one year clinical follow-up. Mean age was 80.3 \pm 6.9 years in AR < 2+ and 80.4 \pm 5.3 years in AR $\geq 2+$ (p=0.73). Mean Euroscore was 20.7 \pm 14.2 in AR < 2+ and 24.6 \pm 18.9 (p=0.34). Mean gradient falls from 45 mmHg to 8 mmHg in AR < 2+ (p<0.001) and 49 mmHg to 9 mmHg in AR $\geq 2+$ (p<0.001). In AR < 2+, left ventricular mass index fall from 130 \pm 33 g/m² to 100 \pm 25 g/m² (p= 0.001) after one year and in AR $\geq 2+$ from 136 \pm 30 g/m² to 96 \pm 26 g/m² (p= 0.001). Relative wall thickness falls from 0.52 \pm 0.14 to 0.40 \pm 0.10 in AR < 2+ (p< 0.01) and from 0.46 \pm 0.10 to 0.36 \pm 0.12 in AR $\geq 2+$ (p<0.01) without significant change in left ventricular end diastolic diameter in time.

Conclusion:

Significant aortic regurgitation in patients underwent TAVI did not slow regression of left ventricular mass and has low impact on left ventricular geometry in a first year after procedure.