Abstract: P753

Impact of transcatheter aortic valve implantation on concomitant mitral regurgitation in patients with severe aortic stenosis

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Topic(s):
Echocardiography: Valve Disease

Citation:
Background: Severe aortic stenosis (AS) and functional mitral regurgitation (MR) frequently coexist. There is no consensus about the optimal therapeutic strategy for patients with combined valve disease. Evidence has shown that double valve surgery is associated with high complication rates and mortality, whereas MR severity may improve after transcatheter aortic valve implantation (TAVI).

Purpose: Aim of our study was to evaluate hemodynamic parameters and cardiac function in patients with severe AS and concomitant MR undergoing TAVI.

Methods: We prospectively enrolled consecutive TAVI patients with concomitant MR. Exclusion criteria were primary cardiomyopathies, prior valve surgery, permanent atrial fibrillation and inadequate echocardiographic imaging. Echo-Doppler assessment, including global longitudinal strain (GLS) and peak atrial longitudinal strain (PALS) (absolute value), was performed before TAVI and after 1-3 months. MR grading was assessed according to quantitative methods (vena contracta and/or PISA). Changes (?) of the main echo parameters before and after intervention were computed. On the basis of MR grading changes, the study population was divided in two groups: no improvement in MR grading (NIMR) and improvement in MR grading (IMR).

Results: Of 49 included patients (M/F=20/29, age 80.7±5.6 years), 23 had mild MR and 26 moderate to severe MR before TAVI. After the procedure, MR grading improved in 11 (IMR) and remained stable in 38 (NIMR) patients. The two groups were comparable for sex, age, body mass index, blood pressure and heart rate. After TAVI, both groups showed an improvement in GLS (17.8±4.7 to 20.1±4.4%, p<0.0001 and 16.8±3.8 to 19.0±3.1%, p<0.01, in NIMR and IMR respectively) and in PALS (20.4±7.4 to 24.2±7.3%, p<0.0001 in NIMR and 19.5±4.5 to 26.7±6.1%, p<0.001, in NIMR and IMR respectively), without significant changes in ejection fraction (p=0.12). Only in IMR group, a significant decrease of systolic pulmonary arterial pressure (sPAP) (45.5±10.6 to 36.3±6.9 mmHg, p<0.001) and left atrial volume index (54.9±14.8 to 48.9±13.3 ml/m², p<0.01) was observed after TAVI. Changes of sPAP (?sPAP) (9.1±6.4 vs. -0.07±6.7, p<0.0001) was higher and ?PALS (-7.2±5.1 vs. -3.8±4.3, p<0.03) lower in IMR compared with NIMR group (Figure). By a multiple linear regression analysis performed in the pooled population, after adjusting for ?PALS, ? aortic valve area and ?GLS, the association between ?sPAP and MR grading improvement remained significant (beta=0.53, p<0.001) (cumulative R²=0.31, SEE=6.9 mmHg, p=0.007).

Conclusion: Afterload reduction following TAVI may induce hemodynamic changes determining also a reduction in MR severity. This mechanism implies a reduction in left atrial pressure, whose PALS is a reliable marker, and a consequent reduction of post-capillary pulmonary hypertension. The association between MR improvement and ?sPAP reduction is independent on echocardiographic confounders.

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