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Left atrial contractile function improves shortly after transcatheter aortic valve replacement. A speckle tracking echocardiography study

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Background. Transcatheter aortic valve replacement (TAVR) reverses LV remodeling and improves overall cardiac function, but data regarding its effect on left atrial (LA) function is scarce. Our aim was to evaluate the short-term effect of TAVR on LA myocardial deformation parameters and the relationship between the improvement of LA function and baseline echocardiographic parameters.

Methods. Fourty-eight consecutive pts (75 ± 6 yrs, 28 men) considered to be at increased risk for surgical aortic valve replacement were enrolled and examined before and 30 days after TAVR. All pts underwent a comprehensive echocardiogram, including speckle tracking echocardiography (STE) for deformation analysis. Longitudinal LA strain parameters were assessed from the apical 4-chamber view. Peak values of global longitudinal LA strain (LAε) and LA systolic strain rate (SSr, reservoir function) and early diastolic strain rate (ESr, conduit function) were measured in all. Contractile LA function (late diastolic strain rate, ASr) was assessed in patients in sinus rhythm (39 pts).

Results. Compared with baseline, the mean indexed LV mass was significantly reduced after TAVR (141 ± 26 vs 160 ± 37 g/m2, p = 0.009) but the mean increase in LVEF was not statistically significant (51 ± 14% vs 47 ± 15%, p = 0.2). There was a significant reduction in systolic pulmonary pressure after TAVR (34 ± 12 vs 42 ± 13, p = 0.004). Although there was no significant decrease in indexed LA volume (51 ± 22 vs 56 ± 20 ml/m2, p = 0.3), the contractile LA function significantly improved 30-days after TAVR (mean ASr, -1.1 ± 0.5 vs -0.8 ± 0.4 %, p = 0.02). There was a tendency of improvement in global longitudinal LA strain (15 ± 7 vs 12 ± 6%, p = 0.06) and global longitudinal LV strain (-13 ± 4 vs -11 ± 5%, p = 0.06) as well. Parameters of LV diastolic function, including TDI derived e' and E/e' ratios were not significantly improved 30 days after TAVI. While LA volumes and function parameters were not significantly different between genders at baseline, the improvement of LA function was more frequently found in male pts (p = 0.05). There were no significant correlations between the improvement of LA function parameters and baseline echocardiographic parameters in our study group. The only predictor of LA booster function improvement was the baseline value of ASr (p = 0.01).

Conclusions. TAVR is associated with a significant recovery of LA function as assessed by STE, suggesting a reverse cavity remodeling. This was accompanied by a significant reduction in LV mass and systolic pulmonary pressure. Men seem to show a more significant improvement in LA contractile function, suggesting a gender-related LA response to chronic afterload reduction.