Tricuspid regurgitation does not impact right ventricular remodeling after percutaneous pulmonary valve implantation

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The aim of the study was to investigate the impact of tricuspid regurgitation (TR) on right ventricular size after percutaneous pulmonary valve implantation (PPVI). We compared patients with pulmonary stenosis (PS) and TR (PS/TR+ group) to patients with PS and without TR (PS/TR- group) as well as patients with pulmonary regurgitation (PR) with and without TR (PR/TR+ and PR/TR- groups), respectively.

Method: In a retrospective study among all patients treated by PPVI (n = 173) those with moderate or severe TR were selected. Indication for PPVI was PS (n=11) and PR (n=9). For all patients included in the study, matched pairs were selected considering cardiac diagnoses, age at implantation, functional state and number of previous surgeries. We analyzed hemodynamic parameters by CMR, the degree of TR by echo and data of exercise testing in all patients before PPVI and 6 months after.

Results: None of the patients had significant post-procedural PS or PR. Regardless of the presence of TR the RV size decreased significantly in all groups (mean end diastolic volume index before and after PPVI in ml/m2: PS/TR+ group: 113 vs. 95 (p=0.01); PS/TR- group: 87 vs. 74 (p=0.01); PR/TR+ group: 133 vs. 112 (p=0.02) and PR/TR- group: 116 vs. 104 (p=0.008); mean end systolic volume index before and after PPVI in ml/m2: PS/TR+ group: 62 vs. 45 (p=0.02); PS/TR- group: 39 vs. 29 (p=0.02); PR/TR+ group: 85 vs. 70 (p=0.05); PR/TR- group: 69 vs. 45 (p=0.01)). There was no statistically significant difference in the reduction of RV Volume indexes between PS/TR+ and PS/TR- groups and PR/TR+ and PR/TR- groups, respectively. The degree of TR improved in 72% of the PS/TR+ group (p=0.002) and 77% of the PR/TR+ group (p=0.001). The improvement in exercise capacity after PPVI did not differ significantly in any of the groups.

Conclusion: Tricuspid regurgitation does not impact right ventricular remodeling after percutaneous pulmonary valve implantation, neither in patients with prevailing PS nor in those with PR.