The impact of aortic valve surgery on left ventricle volume and tricuspid regurgitation in patients with severe aortic regurgitation: a single center study

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Introduction: Chronic aortic regurgitation (AR) results in left ventricular (LV) volume overload, leading to compensatory changes such as LV dilatation and hypertrophy. These adaptive mechanisms enable patients with severe AR to tolerate the increased blood volume for an extended period, even after the LV becomes enlarged and its function is reduced. In recent studies, aortic valve surgery has been shown to improve LV volumes. LV dimension can be used as a predictor of impaired left ventricular functional and structural recovery during follow-up after surgery. Furthermore, severe AR patients often present with coexisting tricuspid regurgitation (TR) and combined have a higher risk of adverse outcomes.[1,2] The aim of this study was to explore the changes in LV end-diastolic volume (EDV), LV end-systolic volume (ESV), mean pulmonary artery pressure (PAP) and TR in patients with severe aortic regurgitation who underwent surgical treatment at the University Hospital Centre Zagreb.

Patients and Methods: In this study 45 patients (87% male, 13% female) with severe AR that underwent aortic valve surgery were included. The average age was 54.8 year, and the average follow-up time was 38 months. The change in EF (%), EDV (ml), ESV (ml), PAP (mmHg) and TR was compared before and after aortic valve surgery.

Results: The results show a statistically significant reduction in EDV (194.46± 80.51 vs. 142.55±56.94, p<0.001) and ESV (96.35±52.45 vs. 75.58±45.44, p<0.001) after AV surgery and change in pulmonary artery pressure (32.14 vs. 23.18). No significant differences were found in EF (53.26±10.92 vs. 52.40±12.53, p=0.612) or the degree of TR (p=0.785). The degree of TR was graded on a scale of 1-5. Prior to surgery, 13 patients (29%) had no TR (grade 0), 29 patients (64%) had grade 1 TR, 1 patient (2%) had grade 3 TR, and 2 patients (4%) had grade 4 TR, and none of the patients required surgical repair. Postoperatively, 12 patients (27%) had no TR (grade 0), 30 patients (67%) had grade 1(mild) TR, 2 patients (4%) had grade 2 (mild to moderate) TR, and 1 patient (2%) had grade 3 (moderate) TR.

Conclusion: This study confirmed that EDV and ESV improved after surgery, as predictors of impaired LV functional and structural recovery. After successful AV surgery, mild TR does not worsen when there is no elevated PAP. However, the impact of TR on the outcomes of these patients requires further research in this area with larger and longer-term follow-up studies.

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LITERATURE

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