Abstract: P1489

Intraventricular flow patterns after percutaneous mitral valve repair with MitraClip implantation in patients with functional MR

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Topic(s): Contrast Echocardiography

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Background: Percutaneous Mitral Valve (MV) repair using MitraClip implantation has become a useful tool for patients with moderate-to-severe and severe mitral regurgitation (MR) and high surgical risk. It is already known that vortex reversal flow occurring after MV replacement with mechanical prosthesis is related with an increase in energy dissipation (ED) and with left ventricular remodelling (LVR). After MV repair (both surgical and percutaneous), vortex reversal flow is not detected and the usefulness of flow assessment in predicting LVR is debated.

Purpose: Aim of the present study was to study intraventricular fluid-dynamics in patients with significant functional MR undergoing Mitraclip implantation and to find if there are differences in cardiac vortices considering different etiologies.

Methods: From May 2015 to December 2017, 23 consecutive patients with severe functional MR undergoing MitraClip implantation were enrolled. All pts underwent contrast echocardiography before and after the procedure (2±1 days) for Echo-PIV analysis and vortex quantification. The following parameters were evaluated by 2D/3D transthoracic echocardiography (TTE): etiology of MR (ischemic and non-ischemic), MV anatomic characteristics, tricuspid regurgitation (TR), pulmonary artery systolic pressure (PASP), LV volumes and function. The following parameters were evaluated by Echo-PIV analysis: vortex area, intensity and geometry, ED, and flow force momentum angle (f°). Acute procedural success (APS) was defined as successful clip implantation with residual MR grade =2+. All patients underwent TTE after 6-month for LV dimension and function assessment. Reverse LVR (rLVR) was defined as a reduction >10% in end systolic volume (ESV) at follow-up.

Results: The study population was divided in two groups according to MR etiology (ischemic 60%, non-ischemic 40%). No differences in baseline TTE and flow analysis were found. Both APS and rLVR rate at follow-up were similar in the two groups. By comparing vortex data before and after the procedure, in all patients, vortex area and intensity decreased after the procedure (0.33±0.13 vs 0.31±0.11; p=0.003 and -0.46±0.16 vs -0.29±0.27; p=0.013) while significant increment in both ED (0.5±0.2 vs 0.9±0.5; p=0.016) and f° (35±7 vs 41±8; p=0.027) was detected. Sub-group analysis showed that ischemic patients were more likely to have a significant vortex area reduction, (0.39±0.04 vs 0.31±0.11; p=0.018) and significant f° increase (43±7 vs 47±4; p=0.027). No significant changes in those parameters were observed in non-ischemic group, in which a trend towards a reduction in LV end diastolic volume (EDV), assessed at FU, was detected.

Conclusion: The results of this study showed significant changes in intraventricular flow patterns following MitraClip implantation in patients with functional MR, with different characteristics between etiologies.
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