

Global Constructive Work predicts left ventricular reverse remodeling one year after MitraClip implantation in patients with functional mitral regurgitation

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Background: Percutaneous edge-to-edge mitral valve repair (PMVr) has recently been identified as an effective method for treating patients with functional mitral regurgitation. However, it is still unknown which patients will benefit by showing clinical improvement and left ventricular reverse remodeling.

Purpose: The purpose of this study is to analyze novel echocardiographic markers and identify markers of LV reverse remodeling after MitraClip implantation.

Methods: We retrospectively analyzed 58 high surgical risk (logistic EuroSCORE 23±15%) consecutive patients (aged 72±10yrs) with functional moderate-to-severe and severe mitral regurgitation (EROA 29±14mm²) and reduced LV contractility (EF 32±8%, GLS -8.6±3.7%). At baseline and 1-year after PMVr we assessed echocardiographic parameters such as MR severity, EF, Global Longitudinal Strain (GLS), Global Work Index (GWI), Global Constructive Work (GCW), Global Wasted Work (GWW) and Global Work Efficiency (GWE).

Results: In patients with MitraClip implantation there was a significant reduction of MR (3.7±0.4 vs 1.7±0.8, p<0.001) one year after the inter-

vention. The EF and GLS did not improve after the implantation (32±8 vs 33±10%, p=0.178 & -8.6±3.7 vs -8.6±3.7%, p=0.922 respectively) but Global Work Index (GWI) and Global Constructive Work (GCW) demonstrated significant improvement (607±282 vs 650±260mmHg%, p=0.04 & 854±288 vs 949±325mmHg%, p<0.001 respectively). The baseline EF, GLS, GWI, GCW and EROA were the factors that were significantly associated with more than 20% reduction of LVEDV one year after intervention (p<0.02 for all). To be more specific, left ventricles with better performance and contractility combined with worse mitral regurgitation were the ones that responded better. Further, baseline GCW was the only factor that was significantly associated with reduction of the LVESV. A ROC curve analysis identified a cut-off value of 846mmHg% (AUC 0.759, 95% CI: 0.588–0.930; p=0.007) to be associated with 10% reduction of LVESV, with a sensitivity and specificity of 79% and 74% respectively.

Conclusions: Transcatheter edge-to-edge repair is an effective method for treating patients with FMR and improves LV performance one year after intervention. A preserved baseline GCW seems to be a good predictor of LV reverse remodeling after MitraClip implantation.