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Residual functional mitral regurgitation post-MitraClip is associated with worse hemodynamics and predicts poor outcome at 2-year follow-up

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Background: Percutaneous mitral valve repair using MitraClip offers symptomatic benefit and improves rest and exercise hemodynamics in patients with severe functional mitral regurgitation (MR). Recent randomized trials have shown contradictory results regarding the impact of MitraClip on mid-term survival in functional MR. It is unknown whether improved hemodynamics are related to patients" outcome.

Purpose: To assess whether residual MR and altered resting and exercise hemodynamics are predictors of outcome in patients with functional MR treated with MitraClip.

Methods: Consecutive patients (n = 45, 72 ± 10years, left ventricular ejection fraction (LVEF) 34 ± 9%) with symptomatic severe functional MR were prospectively evaluated by Doppler echocardiography at rest and during symptom-limited exercise on a semi-supine bicycle pre- and 6 months post-MitraClip procedure. LVEF, MR severity, cardiac output (CO), systolic pulmonary artery pressure (SPAP) and a flow-corrected SPAP/CO ratio were assessed at rest and peak exercise. 2-year follow-up clinical data were collected from patient records.

Results: During 2-year follow-up post-MitraClip, 15 patients (33%) experienced major cardiac events (hospitalization for heart failure (n = 14) and/or cardiac death (n = 5)). Age, gender, a history of coronary artery disease, diabetes, baseline MR severity and baseline SPAP/CO ratio at rest and during exercise were not related to a worse event-free survival. In contrast, patients with events at 2-year follow up had more often a history of hospitalization for heart failure (73 vs. 37%, p = 0.029), lower baseline LVEF (30 ± 8 vs. 36 ± 10%, p = 0.041), more residual MR at 6 months post-MitraClip (MR jet area/left atrial area 27 ± 14 vs. 15 ± 10%, p = 0.004) and higher SPAP/CO ratios at rest and during exercise 6 months post-MitraClip (13.9 ± 5.3 vs. 9.9 ± 3.4mmHg/L/min, p = 0.007 and 13.6 ± 4.9 vs. 9.4 ± 4.6mmHg/L/min, p = 0.009, respectively). When corrected for baseline LVEF, residual MR 6 months post-MitraClip remained an independent predictor for worse 2-year outcome. Residual MR was moderately correlated to a worse SPAP/CO ratio 6 months post-MitraClip (Pearson Rho 0.518, p < 0.001).

Conclusions: In patients with functional MR treated with MitraClip, residual MR at 6-month follow-up is associated with impaired hemodynamics, and is an independent predictor of cardiac events at 2-year follow-up.