PREOPERATIVE LEFT VENTRICULAR SYSTOLIC FUNCTION DEPENDS ON ETIOLOGY OF DEGENERATIVE MITRAL VALVE DISEASE

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Background: Preoperative left ventricular (LV) systolic function is an important prognostic factor in patients undergoing mitral valve surgery. Myocardial strain and strain rate (SR) help identify subclinical LV dysfunction in patients with severe mitral regurgitation (MR) and correlate with contractile reserve. The purpose of this study was to determine the impact of the underlying etiology (Barlow's disease or fibroelastic deficiency, FED) on LV function in degenerative mitral valve disease.

Methods: We studied 233 patients (mean age: 53.8±12.9) undergoing surgery for severe MR due to degenerative mitral valve disease at Almazov Federal Heart, Blood and Endocrinology Centre between 2009 and 2011. Pathologic diagnoses for valvular tissue specimens were provided by experienced pathologist. Preoperative longitudinal strain and strain rate (SR) were determined from three standard apical views, using spackle tracking, for each LV wall (Vivid 7 Dimension, EchoPAC’08) with grey-scale frame rate 50-55/sec.

Results: Barlow’s disease was identified by pathologist in 60 patients (25.8%), FED in 173 patients (74.2%). There were no significant differences between groups in preoperative MR volume (65.9±6.1 ml vs. 62.3±5.7 ml), in global systolic (EFsimpson: 52.7±6.6% vs. 52.0±7.4%, p=0.53) and diastolic (E/e’: 12.2±3.9 vs. 12.8±4.2, p=0.35) LV function. Despite the lack of difference in EF, in Barlow’s disease group compared to FED were detected significant decrease in LV longitudinal systolic (-13.5±2.2% vs. -16.6±2.3%, p=0.008) and diastolic (1.14±0.20 s-1 vs. 1.34±0.18 s-1, p=0.04) strain and SR (-0.89±0.15 s-1 vs. -1.14±0.15 s-1, p=0.002). In the univariate linear regression analyses longitudinal deformation indices were affected by BD diagnosis (p<0.001), sex (p=0.006), fibrosis of excised valve tissue (p=0.01) and maximal depth of mitral leaflet prolapse (p=0.01).

Conclusions: Patients with Barlow’s disease have a lower preoperative LV systolic function that may affect their postoperative long-term survival. This deterioration can be explained by damage of the intramyocardial extracellular matrix in myxomatous Barlow’s disease.