DYNAMIC MITRAL VALVE BEHAVIOR IN ISCHEMIC MITRAL REGURGITATION

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Background: In ischemic mitral regurgitation (iMR), ventricular remodeling results in annular dilatation and restricted posterior leaflet motion. Compensatory valvular changes occur with iMR, however such changes are poorly understood due to lack of dynamic mitral valve quantification tools. We used custom software on three-dimensional echocardiography (3DE) datasets to quantify the dynamic behavior of the mitral annulus (MA) and leaflets in patients with iMR compared to normal subjects.

Methods: Full-volume transesophageal 3DE images (Philips iE33, X7-2t probe) were obtained in 44 patients, including 27 patients with moderate to severe iMR (age 62±10) and 17 normal controls (NL; age 62±16). Prototype software (4D MVA, TomTec; MVQ, Philips) was used to analyze MA and leaflet dynamics throughout systole. The following MA parameters were measured: non-planar angle, displacement, velocity, 3D area and area fraction. The following mitral leaflet parameters were measured: tenting volume, height, anterior and posterior leaflet area.

Results: Compared to normal controls, iMR patients had larger MA areas with a flatter annulus (Figure). The annulus also had reduced displacement, velocity and area fraction. Mitral leaflet tenting volume and height were larger with iMR due to an increase in anterior leaflet area.

Conclusions: In addition to known anatomical changes, there are extensive dynamic valvular changes with iMR, which have implications for planning surgical repair.