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Title: LEFT ATRIAL STRAIN OF LOW GRADIENT SEVERE MITRAL STENOSIS FOLLOWING BALLOON MITRAL VALVULOPLASTY

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Background & Aims: Low gradient severe mitral stenosis (LGMS) is defined as mitral valve area (MVA) less than ≤ 1.5 cm² and mitral valve gradient (MVG) < 10 mmHg. Functional changes in the left atrium (LA) are one of the mechanisms that follow LGMS. Balloon Mitral Valvotomy (BMV) is the treatment of choice for suitable mitral stenosis patients without contraindications. This study compared changes in Left Atrial Reservoir Strain (LARS) following BMV between low- and high-gradient severe MS patients.

Methods: We included MS patients who underwent a successful BMV and divided into LGMS group and high-gradient mitral stenosis (HGMS) group. Using speckle tracking echocardiography, LARS was assessed 24-48 hours before and 7-14 days after BMV procedure. Then, the LARS values were compared between those two groups using Mann-Whitney.

Results: There were 32 patients (46%) in the low-gradient MS group and 39 patients (54%) in the high-gradient MS group. Subjects with LGMS were older, had more atrial fibrillation, had a larger baseline MVA, and had higher net atrioventricular compliance (Cn). The LARS values were low in both groups and improved significantly following BMV [8% (2-23) vs. 11% (3-27), $p < 0.0001$]. There were no differences in LARS values before, after BMV, and its absolute changes between the groups. Subgroup analysis in subjects with sinus rhythm revealed differences between low and high-gradient MS pre ($15 \pm 4\%$ vs. $11 \pm 5\%$, $p = 0.030$) and post-BMV ($19 \pm 4\%$ vs. $15 \pm 4\%$, $p = 0.019$).

Conclusions: Left atrial reservoir function, as assessed by LARS, was reduced in patients with severe MS and was increased following BMV, irrespective of their baseline MVG. However, in patients with sinus rhythm, the LGMS group had higher LARS before and after BMV compared to those in HGMS group.