Conclusions: In patients with moderate to severe organic mitral regurgitation, normal cardiopulmonary functional capacity and low NT-proBNP level, E velocity, E/Em ratio, LV mass index, and time interval between echo test less than 42 days (OR 1.52, p=0.059) were associated with impaired LV contractility, probably due to fibrosis of the myocardium.

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Effects of left atrial strain on functional capacity in severe organic mitral regurgitation
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Purpose: Decreased Left Atrial (LA) strain was noted in patients with severe organic Mitral Regurgitation (MR). However, effects of LA deformation on functional capacity of patients with severe MR were not fully studied. The aim of this study was to investigate the effects of LA deformation on severity of symptoms in patients with severe organic MR.

Methods: This study recruited 110 (55% men, 57±16 years) consecutive patients with severe organic MR and preserved left ventricular systolic function who underwent echocardiography in the outpatient clinic. LA deformation including strain and strain rate were assessed by two-dimensional speckle tracking echocardiography with commercialized software. Global peak LA Longitudinal Strain (LAS), peak strain rate in reservoir phase (LSRr), and in conduit phase (LSRc) were identified from strain and strain rate curves. Severity of heart failure symptoms were evaluated by New York Heart Association (NYHA) functional classification.

Results: There were 35 (32%) patients in NYHA I, 62 (56%) in NYHA II, and 13 (12%) in NYHA III. Age (50±13, 60±17, 65±16 years; p=0.04), presence of atrial fibrillation (0%, 13%, 31%; p=0.007), left ventricular mass index (102±28, 106±29, 128±33 g/m²; p=0.017), estimated pulmonary artery systolic pressure (31±15, 38±18, 50±30 mmHg; p=0.011), LAS (29.9±8.9, 25.2±10.1, 18.8±6.4; p=0.002), LASRr (2.5±0.5, 2.3±0.7, 2.0±0.8 s-1; p=0.055), and LASRc (2.1±0.8, 1.7±0.5 s-1; p=0.015) were changed gradually in respective to NYHA functional class I to III. There were no differences in left ventricular ejection fraction, left atrial volume index, left atrial emptying fraction, effective regurgitant orifice area, and regurgitant fraction of MR between NYHA functional classes. After multivariate logistic regression analysis controlling age and status of atrial fibrillation, only LAS (OR 0.891, 95% CI 0.796-0.997, p=0.046) was an independent factor for predicting severe symptoms of heart failure (NYHA III). Furthermore, we found that age (OR 1.081, 95% CI 1.033-1.132, p=0.001) and diabetes mellitus (OR 10.379, 95% CI 1.008-106.83, p=0.049) were independent factors for a decreased LAS in these patients.

Conclusions: In patients with severe organic MR, LAS correlates with the severity of heart failure symptoms. Age and diabetes mellitus were independent factors for a decreased LAS in these patients.

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Left atrial strain and strain rate before and after restrictive anoplasty for ischaemic mitral regurgitation evaluated by two-dimensional speckle tracking echocardiography
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Purpose: We retrospectively evaluated left atrial (LA) strain and strain Rate (SR) before and after undersized mitral ring anoplasty (UMRA) for chronic ischemic mitral regurgitation (CMR) with two-dimensional speckle-tracking echocardiography (2D-STE).

Methods: LA volumes, LA reservoir, conduit, and contractile phases and LA ejection fraction (LAEF) were measured in 30 CMR patients who underwent coronary bypass grafting (CABG) and UMRA. Left atrial peak global strain and reservoir (SRp), conduit (SRE) and contractile phase (SRA) strain rates were obtained at baseline and at follow-up (median 11±5 months, interquartile range 23-41). Based on the recurrence of mitral regurgitation (MR) at the follow-up, the patients were divided into 2 groups: patients with Group MR+, n=30 or without (Group MR-, n=0) recurrent MR. Twenty age- and gender-matched healthy subjects were controls.

Results: In the MR- Group baseline: (p<0.001), SRp (p=0.001), SRE (p<0.001) and SRA (p=0.001) were enhanced while in MR+ Group: p=0.019, SRp (p=0.003), SRE (p=0.003) and SRA (p=0.003) were worse compared to controls. Follow up none of these indices changed in the MR+ group while all returned to normal values in patients belonging to the MR- group. LA deformation correlated with corresponding volumetric parameters. Furthermore, we found a direct correlation between SRE and early peak diastolic velocity (E) (r=0.52, p=0.02) and E-wave deceleration time (DT) (r=0.50, p=0.02). Finally, there was a strong correlation between SRE, SRA, and SRE- SRA (r=0.59, p=0.001) and SRP and SRA (r=0.72, p=0.001 and r=0.78, p=0.001, respectively) and SRE (r=0.69, p=0.001 and r=0.71, p=0.001, respectively).

Conclusions: Left atrial peak global strain, peak systolic strain rate, and peak early diastolic strain rate were cofactors associated to recurrent MR. The assessment of LA strain and strain rate, in addition to other echocardiographic parameters, can be helpful in detecting patients undergoing UMRA who are unlikely to benefit from anoplasty.

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Mitrval regurgitation improvement after conversion of atrial fibrillation to sinus rhythm
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Background: Presently there is limited data on the effect of atrial fibrillation (AF) on the severity of mitral regurgitation (MR).

Objective: To determine whether in patients with significant MR, conversion of AF to sinus rhythm might reduce the severity of MR.

Methods: Between 1992-2011, 446 patients (52% females, mean age 74.0±12.3 yrs) with significant MR and AF underwent cardioversion to sinus rhythm. All had follow up echocardiography within 6 months. We compared the severity of MR during AF to that during sinus rhythm. Improvement was regarded if MR was reduced by at least 2 grades. MR severity was graded as 1-no or minimal, 2-mild, 3-moderate, 4-severe.

Results: After 6 months, 278 (62.3%) patients remained in sinus rhythm (group 1) and 168 (37.7%) were in AF (group 2). There was no difference between the groups with regard to hypertension, diabetes, stable or unstable coronary artery disease.

In 122 (27.4%) patients, MR severity improved by more than two grades and it was more pronounced in males 32.5% vs females 22.6% (p=0.019). Significant MR improvement was seen in 115 (32.2%) comparing to group 1 (19.9%, p=0.002). Left ventricular diameter improved significantly (left ventricular end diastolic (LVEDD) from 5.13 cm to 4.98cm, p<0.036, left ventricular end systolic (LVESD) from 3.62cm to 3.40cm, p=0.034) compared to group 2 (LVEDD 5.18 cm to 5.25cm, p<0.3410, LVESD 3.69cm to 3.71cm, p<0.2955). Univariate analysis revealed sinus rhythm (OR 1.73, p=0.024), male gender (OR 1.55, p=0.046) and time interval between echo test less than 42 days (OR 1.52, p=0.059) were predictors for significant MR improvement. Multivariate analysis revealed sinus rhythm remained an independent factor for significant MR improvement (OR 1.9, p=0.007).

Conclusions: In 27% of patients with paroxysmal AF, MR improves significantly after cardioversion to sinus rhythm. Final assessment of MR severity should be based on echocardiographic data when the patient is in sinus rhythm.