

**Aim:** To study the procedural success of percutaneous mitral commissurotomy (PMC) and one month outcomes in patents with mitral valvular calcification.

**Methods and results:** Over a period of 13 months we enrolled 103 patients who underwent PMC in our institution. All patients were screened for fluoroscopic calcium and divided into two groups: group 1 without significant calcium (no calcium or calcium seen in cine fluoroscopy) and group 2 with significant calcium (calcium seen in high fluoroscopy). There were 85 patients in group 1 and 18 patients in group 2 and procedural success was 91.8% and 72% respectively in two groups ( $P = 0.034$ ). Confidence interval of procedural success in calcific group was 51.5–92.9%. In this study, the presence of mitral calcium detected by echocardiography or cine fluoroscopy did not influence the immediate success of PMC. There was no procedural death and none developed severe mitral regurgitation (MR) or required mitral valve surgery within one month post procedure. Other parameter that influenced procedural success was Wilkins score  $>8$ . All patients except two improved symptoms to New York Heart Association (NYHA) I/II at one month follow-up.

**Conclusion:** PMC success rate in patients with significant fluoroscopic calcium is inferior to those without significant calcification. Still the success rate in calcific group is good without additional complication.

### Prevalence and prognostic significance of left ventricular myocardial late gadolinium enhancement in severe aortic stenosis



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**Background:** Myocardial fibrosis occurs in aortic stenosis (AS) as part of the hypertrophic response. It can be detected by late gadolinium enhancement (LGE), which is associated with an adverse prognosis in the form of increased mortality and morbidity.

**Objectives:** To assess the prevalence of LGE patterns using cardiac magnetic resonance (CMR) in severe AS patients and to study the prognostic significance of LGE pertaining to mortality, arrhythmic risk, heart failure/hospitalization and LV ejection fraction  $\geq 20\%$ .

**Methods:** Patients were enrolled into the study from June 2012 to November 2014. All the patients underwent CMR and various patterns of enhancement were studied. These patients if symptomatic were advised aortic valve replacement (AVR) and others were managed conservatively. All patients were followed up and watched for outcomes like mortality, heart failure/hospitalization for cardiovascular cause, fall in left ventricular ejection fraction (LVEF)  $\geq 20\%$  and arrhythmia.

**Results:** A total of 109 patients (mean age  $- 57.7 \pm 12.5$  yrs) underwent CMR with 63 males. These patients were followed up for a mean of 13 months. Among 38 patients who underwent AVR, 6 died (5 – cardiovascular cause, 1 – non cardiovascular). 71 patients were managed conservatively out of which 18 died (17 – cardiovascular cause, 1 – non cardiovascular cause). LGE patterns were seen in 46 patients (43%); midmyocardial enhancement was seen in 31.1% of cases (33 patients). No LGE pattern was seen in 57% (63 patients). Basal and mid regions were maximally involved with mid myocardial enhancement in 66% & 68.3% respectively. LV ejection fraction ( $p = 0.002$ ), peak aortic systolic velocity ( $p = 0.01$ ) and peak aortic systolic gradient ( $p = 0.02$ ) were the main predictors of LGE. Main predictors of primary outcome were NYHA class [OR  $- 13.4 (2.8-26.1)$ ,  $p \leq 0.001$ ], age  $- 62 \pm 9.6$  yrs ( $p = 0.001$ ), EF simpson- $50.9 \pm 13\%$  ( $p \leq 0.001$ ), LGE [OR  $2.8 (1.27-6.47)$ ,  $p = 0.01$ ], number of segments involved [ $2.37 \pm 2.1$ ,  $p \leq 0.001$ ] & CMR LV mass ( $151.73 \pm 32$  g,

$p = 0.007$ ). LGE truly predicted heart failure/hospitalization for cardiovascular cause [OR  $- 3.8 (1.2-11.9)$ ,  $p = 0.01$ ] and fall in LVEF [OR  $- 5.8 (1.5-22.5)$ ,  $p = 0.005$ ]. Patients with LGE had 2.87 times risk of adverse outcomes and patients with more than 3 segment LGE involvement had again increased chances of adverse outcomes.

**Conclusions:** LGE was detected by CMR in 43% of patients with severe AS. It predicted recurrent heart failure, hospitalization for cardiovascular cause and fall in LV ejection fraction. Our study has laid a path to larger prospective studies with long term follow-up to assess the prognostic impact of CMR in patients with severe AS.

### Prognostic importance of exercise brain natriuretic peptide in asymptomatic chronic organic mitral regurgitation



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**Background:** Early surgery could be advisable in selected patients with chronic severe mitral regurgitation, but there are no criteria to identify candidates who could benefit from this strategy. In patients with primary mitral regurgitation (MR), BNP is known to be a good surrogate marker of MR consequences on the left ventricle, left atrium, and systolic pulmonary arterial pressure (PAP), and is a powerful predictor of outcome. It is hypothesized that the measurement of BNP at exercise could provide incremental value as compared with standard resting BNP for the risk stratification of patients with asymptomatic MR.

**Methods and results:** Comprehensive resting and exercise transthoracic Doppler echocardiography was performed in 50 consecutive asymptomatic patients with moderate to severe MR and preserved left ventricular (LV) function enrolled over a period of 12 months from October 2013 to October 2014. Blood samples were collected both at rest and during exercise. Follow-up was done every 3 months for 1 year. The BNP level significantly increased from rest to exercise in 16 patients. There was a significant graded relationship between increasing BNP level at exercise (according to tertiles) and increased incidence of cardiac events (death, heart failure, mitral valve surgery driven by symptoms, or LV dilatation/dysfunction onset) (1 year,  $10 \pm 5\%$  vs.  $20 \pm 6\%$  vs.  $40.5 \pm 9$  in tertiles 1, 2 and 3, respectively). On multivariable analysis, after adjustment for demographic and echocardiographic data and for resting BNP level, exercise BNP remained significantly associated with increased risk of cardiac events during the follow-up (hazard ratio 2.6 and 3.8,  $P = 0.040$  and  $0.020$ , for tertiles 2 and 3, as compared with tertile 1).

**Conclusions:** In asymptomatic patients with primary MR, exercise BNP level provides incremental prognostic value beyond what is achieved by demographic and echocardiographic data and resting BNP level. Patients with elevated exercise BNP should be considered at high risk of reduced cardiac event-free survival.

### Balloon mitral valvuloplasty in situs inversus dextrocardia with rheumatic mitral stenosis



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**Objective:** To demonstrate the safety and efficacy of balloon mitral valvuloplasty in patients of rheumatic mitral stenosis and situs inversus with dextrocardia.

**Background:** Distorted cardiac anatomy and cardiac malpositions increase the complications of interatrial septal puncture and left ventricular entry during balloon mitral valvuloplasty.

**Methods:** Five patients with rheumatic mitral stenosis and situs inversus with dextrocardia were included in this study. Mean transmitral gradient before balloon mitral valvuloplasty ( $18 \pm 6$  mmHg) was significantly higher, while mitral valve area (MVA) ( $0.68 \pm 0.4$  cm<sup>2</sup>) was significantly lower. All the five patients were young (mean age of 32 years) and symptomatic (mean pulmonary artery pressure  $60 \pm 10$  mmHg). Left femoral venous and arterial approach was used. Fluoroscopic imaging was performed without inverting the images although the software for the same was available. The interatrial septum was approached using fluoroscopy guide with needle directed towards the spine and keeping the pointer of Brockenbrough needle at seven to eight O' clock position followed by transatrial puncture in left lateral view. The transit across the mitral valve was done in left anterior oblique view without using pseudo right anterior oblique imaging with just clockwise or counter clockwise guidewire movement. Simultaneous transthoracic echocardiography guidance was used.

**Results:** Pre and post balloon mitral valvuloplasty hemodynamic parameters were compared. Mean transmitral gradient before balloon mitral valvuloplasty ( $18 \pm 6$  mmHg) was significantly higher, while mitral valve area (MVA) ( $0.68 \pm 0.4$  cm<sup>2</sup>) was significantly lower. All the five patients were young (mean age of 32 years) and symptomatic (mean PA pressure  $60 \pm 10$  mmHg). After balloon mitral valvuloplasty, mean PA pressure was significantly reduced [ $33.5 \pm 12$  mmHg], with a significant reduction in transmitral gradient ( $8.2 \pm 3.5$  mmHg), with an increase in mitral valve area ( $2.1 \pm 0.6$  cm<sup>2</sup>).

**Conclusion:** This case series demonstrates the safety and efficacy of balloon mitral valvuloplasty without inverting the images on fluoroscopy.

## Mitral valve repair – Is replacement not an ideal operation anymore?



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**Introduction:** MV repair remains standard of care in the world today. It is different in India with RHD. MV repair summary data by a single surgeon is presented here.

**Methods:** Prospective data on all MV repairs since 01/2004. Patients were regularly followed up and those unable to come were subject to a telephonic interview along with review of their latest ECHO report.

**Results:** 163 patients underwent MV repair between 01/2004 and 06/2015. The mean age of patients was 40 years (range 8–81). 58 (36%) were female patients. 70 (43%) were RHD patients, 40 (25%) degenerative mitral valve disease, 34 (21%) ischemic MR, 15(9%) congenital MV disease, 2(1%) with SBE and 2(1%) with other aetiologies. Majority (144, 88%) patients had NYHA class III and above symptoms. The mean EF was 53% (min 25% and max 79%). 10(6%) patients had incidental mild to severe MS while the rest had Grade 3 and above regurgitation. Mean preop mitral annulus diameter was 38 mm (Min 23, Max 50). More than moderate PA pressures were present in 69 (42%) patients. All procedures were performed via median sternotomy. The complexity of the repair was reflected on the number of techniques needed to achieve competence. On an average, at least 2 techniques were necessary, while some patients needed as many as 6. Average follow up was 18 months in the cohort. The maximum follow up time was 96 months. 44 patients were lost to follow up.

There were 2 deaths in the whole dataset, 1 was post operative mortality and one at 12 months follow up. Three patients had significant mitral regurgitation on follow up, one of whom has been reoperated. All of these patients were RHD.

**Conclusion:** Mitral valve repair, in expert hands provides good long term outcome, free from reoperation. Moreover morbidity and mortality related to anticoagulant therapy was significantly minimized

## Acute and short term effect of balloon mitral valvuloplasty on p wave dispersion and atrial electro-mechanical delay in subjects of mitral stenosis



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**Background:** The predisposition to atrial fibrillation (AF) in mitral stenosis (MS) has been demonstrated with several electrocardiographic (increased P-wave dispersion) and echocardiographic parameters (atrial electromechanical delay). The effect of percutaneous balloon mitral valvuloplasty (PBMV) on these parameters and the onset of AF later have not been studied in detail till now.

**Aim of the study:** Acute (within 48 h) and short term (at 6 months) effect of PBMV on P-wave dispersion (PWD) and atrial Electro-Mechanical Delay (EMD) in patients of Mitral Stenosis and sinus rhythm.

**Method:** 34 patients of MS have been studied till date with follow up of 8 patients (study is ongoing and full data will be presented in conference). 12 lead ECG and detailed Echocardiographic evaluation was done for each patient one day before, at 48 hours after PBMV and at 6 months. The P-wave dispersion was calculated from 12-lead ECG. Interatrial and intra-atrial EMDs were measured by tissue Doppler echocardiography. These ECG and echocardiographic parameters after PBMV were compared with baseline values. Additionally at 6 months 24 hour Holter monitoring has been planned to rule out paroxysmal AF.

**Result:** 34 patients of critical MS who underwent successful BMV have been studied till date (24 females and 10 males, aged mean  $28.74 \pm 8.55$  years, with a mean MVA of  $0.75 \pm 0.15$  cm<sup>2</sup>). After PBMV, there was significant improvement in the interatrial EMD ( $46.03 \pm 18.36$  ms vs.  $62.00 \pm 28.11$ ,  $p < 0.01$ ) and left-sided intra-atrial EMD ( $34.65 \pm 16.94$  vs.  $49.32 \pm 30.14$ ,  $p < 0.01$ ) compared to baseline with no significant change in right sided intraatrial EMD ( $16.41 \pm 17.86$  vs  $15.65 \pm 13.34$ ,  $p = 0.854$ ). There was also significant decrease in PWD following PBMV compared to baseline ( $34.12 \pm 12.74$  vs  $41.88 \pm 15.82$ ,  $p < 0.01$ ). In 8 patients who have completed 6 months follow up, there was tendency of further decrease in left sided EMD with no patient developing AF.

## Study role of echocardiographic TDI (tissue Doppler imaging) and strain imaging for detection of subclinical LV dysfunction in patients of rheumatic mitral valve disease



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