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A Prospective Study on the Early Post Operative Outcome of Mitral Valve Repair – A Single Center Study

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ABSTRACT
Valvular heart disease is a major health problem in our country due to the increased incidence of rheumatic fever and poor compliance to penicillin. Most patients underwent mitral valve replacement for this condition but the morbidity and mortality were significant due to valve related and anticoagulation related complications. While percutaneous interventions offer acceptable results, their use is limited in mixed valvular heart disease. In our experience, mitral valve repair is superior to valve replacement across all age groups. There is decreased incidence of bleeding and thromboembolic events with an average of 7-day hospital stay and low operative mortality.

Keywords: *Mitral valve, repair, chordal shortening, neo chordae, annuloplasty*

INTRODUCTION
Sir Lauder Bruton was the first to consider surgical treatment of mitral stenosis in his "preliminary note" in The Lancet in 1902(1). Elliot Carr Cutler did experimental work on surgical approaches to mitral stenosis. In 1923, he and Samuel Levine reported an operation via median sternotomy in which a special curved knife was inserted through the left ventricular apex to cut a stenotic mitral valve (2).

Attempts at trans ventricular valvulotomy produced severe post operative mitral regurgitation which resulted in several deaths. Cutlet eventually abandoned the procedure (3). In 1925, Henry Soutar, opened a stenotic mitral valve through the left atrial appendage using his finger (4). Post World War II, Harken and Bailey polarized the method of closed mitral commissurotomy for mitral stenosis using the finger fracture technique. Until the early 1970s, closed mitral commissurotomy procedure was regarded as one of the most widely utilized techniques to treat and relieve mitral stenosis. Technical modifications subsequently added to closed commissurotomy included Tubb's trans ventricular dilator, used with digital control by finger inserted through the left atrial appendage (5).

Mitral regurgitation was also recognized to incur adverse outcomes prompting similar though more sporadic attempts at surgical correction. Few closed methods of surgical correction of mitral regurgitation were reported during the 1950s by Bailey, Davila, Nichols and colleagues (6,7,8). In 1957, an effective open approach using CPB was demonstrated by Lillie and colleagues (9) and Merendino and Bruce (10). One successful attempt to relieve mitral regurgitation was developed by Harold Kay, who obliterated the commissures using a sequence of mattress sutures. A circular technique developed by Paneth and DeVega, involving a circumferential suture around the annulus, aided in early attempts at mitral valve repair. In 1960, Dwight McGoon described an effective repair for mitral regurgitation due to ruptured chordae (11).

With the advent of prosthetic devices to replace mitral valve in the early 1960s, mitral valve replacement was emerging as the treatment of choice as opposed to mitral valve repair. It was believed prudent to cut the papillary muscle and all the chordal attachments to the mitral leaflets to ensure an anatomically secure mitral valve replacement.

The early 1980s heralded a new development in mitral valve reconstructive surgery with the invention of prosthetic remodeling annuloplasty rings. Alan Carpentier and Carlos Duran were credited with implanting prosthetic rings to refashion and remodel the mitral annulus. In 1983, Dr. Carpentier gave the classic lecture entitled, "The French Correction", outlining the basic principles of repair for the prolapsed mitral valve and emphasized the importance of an annuloplasty ring.

As a result of these contributions, mitral valve repair, if possible, has become recognized as the procedure of choice for mitral valve pathology of any etiology, even for patients with cardiomyopathy and heart failure, to the extent that mitral valve repair is always considered first in virtually any clinical situation in which mitral valve is regurgitant.

Aim

A prospective study on the immediate and early post operative outcome of mitral valve repair, a single Centre study.

MATERIALS AND METHODS

Informed and written consent was obtained from all the patients enrolled in the study

Duration of study = October 2022 to August 2024

Total patients = 59 patients. 23 male patients and 36 female patients

Inclusion Criteria

- Patients with moderate to severe mitral regurgitation
- Patients willing to enroll in the study
- Patients planned for elective surgical repair

Exclusion Criteria

- Patients with mitral stenosis, aortic stenosis or aortic regurgitation
- History of previous heart surgery
- Patients with associated coronary artery disease
- Patients planned for emergency surgical repair

Methods

Surgical fitness is obtained from the cardiac anesthesiologist. Under general anesthesia, patient placed in supine position. Parts (chest and abdomen) are painted with povidone iodine solution and draped with sterile surgical sheets. Conventional midline sternotomy is done. Thymus is dissected and excised. Pericardium is opened and pericardial stay sutures are taken. Transesophageal 2D echocardiogram is inserted and the valve is analyzed by the surgeon and cardiac anesthesiologist. Systemic heparinization is given, 4mg/kg body weight. Wire reinforced cannula is used for aortic cannulation. Right angled metal tipped DLP cannula is used for superior vena cava (SVC) and inferior vena cava (IVC) cannulation. Target activated clotting time (ACT) of 480 seconds was achieved. Patient is initiated on cardiopulmonary bypass (CPB). Patients core body temperature is cooled down to 28^{o}C. Aortic cross clamp is applied. Cold blood antegrade root Delinda cardioplegia is used for myocardial protection. Interatrial groove is dissected. Left atrial approach is preferred for our patients and left atrium is entered. Detailed analysis of valve morphology; the annulus, commissures, pliability of leaflets, chordae, sub valvar apparatus is done. Depending on the morphology, one or more procedures is/are chosen for the repair; namely, commissurotomy, copal thickening, quadrangular or triangular excision, neo chordae, chordal shortening, annuloplasty. If annuloplasty is chosen, Teflon ring mitral annuloplasty, Carpentier Edwards (CE) classic or physio ring annuloplasty was done using interrupted 3-0 ethion sutures. CV 5 PTFE sutures was used if neo chordae creation is the chosen surgery for the patient. Saline test is done to check the competency of the mitral valve after repair. If there is minimal leak, patient is slowly rewarmed to 36^{o}C. Left heart is deaired through the left atrium and aortic root. Left atriotomy is closed with 4-0 proline sutures. Aortic cross clamp is released. Patient is gradually weaned off cardiopulmonary bypass once sinus rhythm is attained. Intra-operative transesophageal 2D echocardiogram is used to check the efficacy of the repair. After securing hemostasis, chest was closed with No. 6 steel wires.

RESULTS

Statistics:

Continuous or interval-based variables were expressed as mean ± standard deviation. Categorical variables were expressed as variables. Chi-square test was used to calculate the p value as applicable.

This study of Mitral valve repair had a total of 60 patients. In this group, 23 patients (38.3%) were male and 37 patients (61.7%) were female.

Table 1: Gender

	Frequency	Percent
MALE	23	38.3

FEMALE	37	61.7
Total	60	100.0

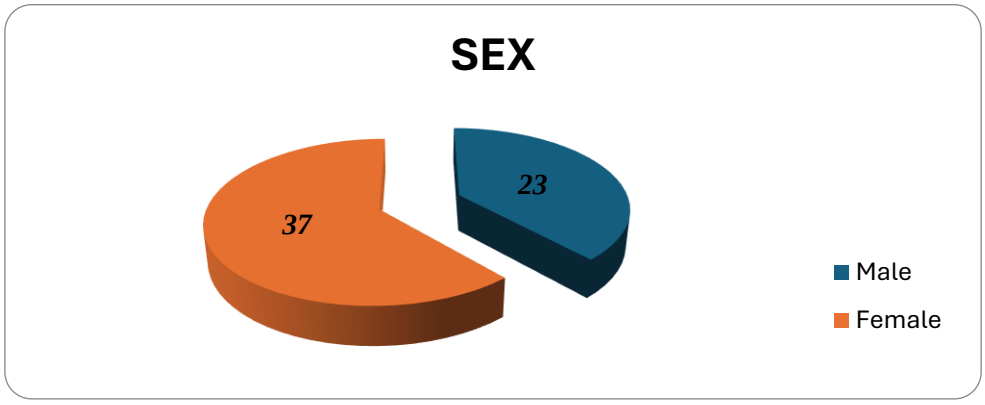

Figure 1. The mean age at surgery was 36.67 years with a minimum age of 10 years and a maximum age of 75 years

Table 2: Age

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	60	10	75	36.67	16.695

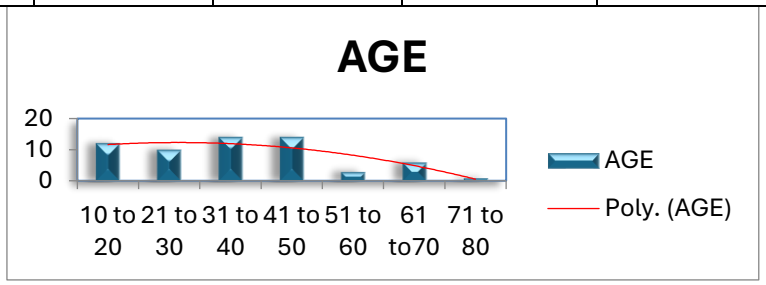

Figure:2

Pre-operative trans-thoracic echo cardiogram was performed in all patients. MS was graded with the Peak gradient and Mean gradient across the mitral valve. MR was graded by Doppler Echo cardiography.

Echocardiographic assessment included the annulus, leaflet thickening, mobility, commissural and chordal fusion, presence of calcification, regurgitant jet, presence of clots in left atrium, gradient across the mitral valve.
Of the 60 patients, 39 patients (65%) had only MR, and 19 patients (31.7%) had only MS. 2 patients (3.3%) had mixed lesions with MS and MR.

Table 3: Type of Lesion

	Frequency	**Percent**
MS	19	31.7
MR	39	65.0
BOTH	2	3.3
Total	60	100.0

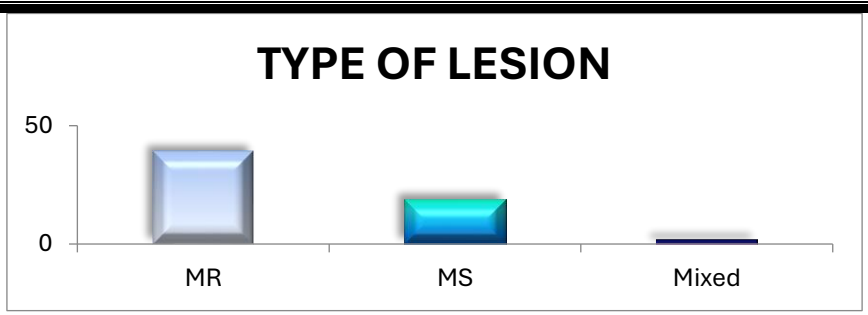

Figure:3

Majority of patients, 39 (65%) had pure MR and 2 patients (3.3%) had mixed lesions out of which 27 patients (65.9%) had severe MR and 14 patients (34.1%) had Moderate MR.

Table 4: MR Severity Pre-Op

	Severity in MR		
PREOP	MODERATE	Count	14
		% of Total	34.1%
	SEVERE	Count	27
		% of Total	65.9%
Total		Count	41
		% of Total	100.0%

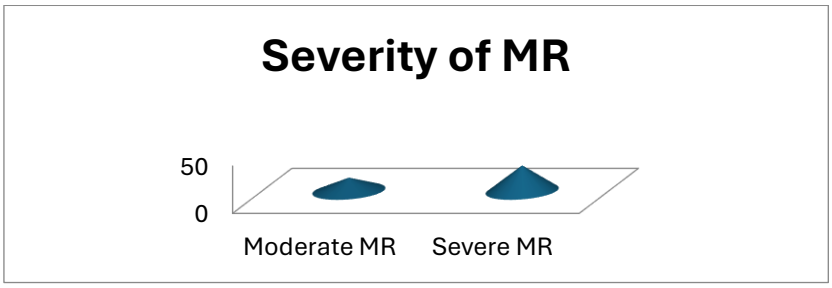

Figure:4

19 patients (32.7%) had only MS with varying degrees of severity. Of these patients 17 patients underwent only open mitral valvotomy (OMV) and two patients underwent chordal release along with OMV.

In the group of patients who had mixed lesions, detailed intraoperative study of the valve morphology including annulus, leaflets, commissures, and sub valvular apparatus were done and suitable repair was done accordingly.

Pre op Nyha Class

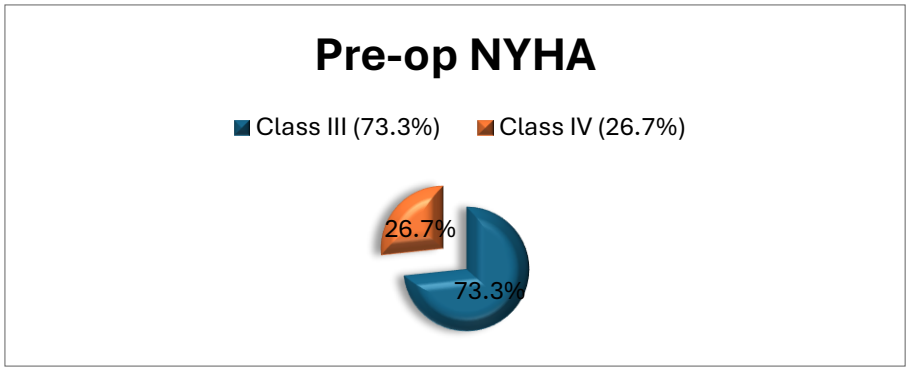

Figure:5

The clinical features were classified according to NYHA class. In the study population 73.3 % of patients had NYHA class III symptoms and 26.7% of patients had NYHA class IV symptoms

In our study population, 39 patients had MR we noted annular dilatation, prolapsed leaflets, chordal elongation and chordal rupture with regard to the prolapsed leaflet.

AML prolapsed was found to be most common with 23 (38.3%) patients having to undergo repair to the AML. A2 and A3 segments were mostly involved. A1 segment was involved only in 6 patients
13 (21.6%) patients had PML prolapse which involved P2 segment and in those 8 patients had involvement of P3 segment also.

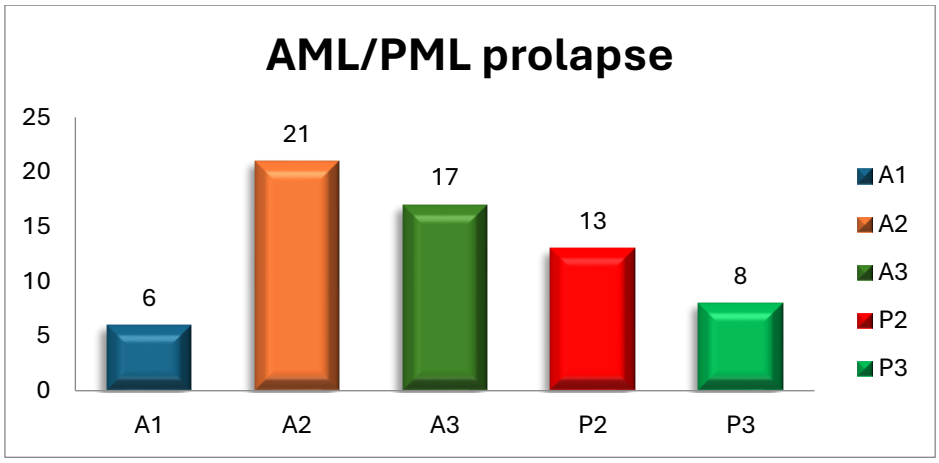

Figure:6

Restricted leaflet mobility was found in the PML for 6 patients and in AML for 4 patients for whom chordal release was done to the appropriate segment.
In the 19 (31.7%) patients with isolated mitral stenosis, Open mitral valvotomy was done for 18 patients and one patient had chordal release of the P2, P3 segments. Annuloplasty ring was used for 10 patients and 9 patients underwent only OMV without any annuloplasty ring.

There were 2 patients with mixed lesions in the study population and both patients underwent OMV with annuloplasty ring placement.

Our surgical techniques include ring annuloplasty – Teflon ring which is prepared on table and commercially available classic and physio ring. The other technique was open mitral valvotomy, chordal shortening, chordal release, neo chordae creation.

On the whole, 51 patients underwent annuloplasty. Classic ring was used in 35 patients, Teflon ring was used in 12 patients and physio ring was used in 4 patients

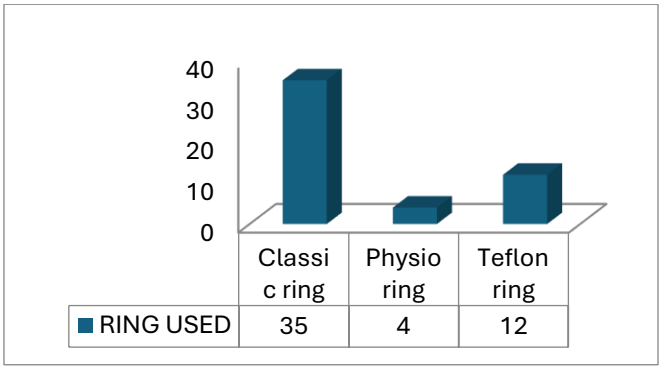

Figure:7

Neo chordae was created in 19 patients (31.6%) using CV 5 PTFE sutures. Majority of the neo chordae were to the A2, A3 segments (12 patients) and in one patient, the complete chordal support was reconstructed using neo chordae.

Chordal shortening was done for 15 patients (25%). We used 5-0 proline for shortening of chordae.

Chordal release/ sub valvular release was done for 13 patients (21.6%).
OMV was done for 20 patients (33.33%)

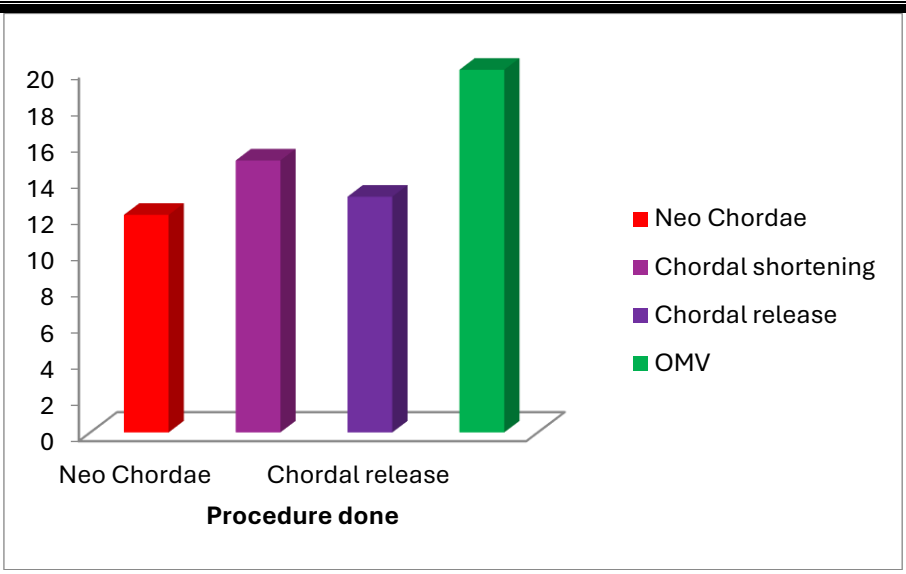

Figure:8

Cuscal thinning or debulking was done for some patients who had mild to moderate calcification of the leaflets. This is performed by gently peeling of the matrix over the leaflets

The duration of CPB ranged from 38 minutes to 210 minutes with a mean of 95.13min ± 35.162 minutes.

Aortic cross clamp time ranged from 20 minutes to 156 minutes with a mean of 65.53 minutes ± 28.812 minutes.

All patients were on ventilator support while shifting from the OR. Patients were ventilated in the ICU from 6 hours to 12 hours based on the ABG reports, awakens and respiratory rate.

Our inotropic strategy was to start the patient on In Dobutamine 5mcg/kg/min while weaning off CPB. Some patients were also started on In Noradrenaline and/or In Adrenaline if the cardiac output was low.

ICU stay was between 27 hours to 62 hours with a mean of 41.62 hours ±8.057. The patients were extubated and then inotropes were tapered. Once all inotropes were stopped, patients were shifted out of ICU after removing the drain tubes if hemodynamically stable.

Nearly all patients had two chest drains and some patients had three drains if necessary. The total drain amount was ranging from 100ml to 200ml with a mean of 129.50 ml ± 23.894

After the patients were shifted to ward, epicardial pacing wires were removed the next day. Chest x-ray, ECG and ECHO were taken on the same day. IV Antibiotics were continued for up to five days and stopped. In some patients who had signs of wound infection or increased Total WBC counts, IV antibiotics were continued till discharge and then oral antibiotics were used if needed. The duration of hospital stays ranges from 6 days to 9 days with a mean of 7.47 days ± 0.833.

Table: 5

	N	Minimum	Maximum	Mean	Std. Deviation
CPB TIME (mins)	60	38	210	95.13	35.162
AORTA CROSS CLAMP (mins)	60	20	156	65.53	28.812
Ventilation time (hours)	60	6	12	9.12	1.767
ICU (hours)	60	27	62	41.62	8.057
ICD (ml)	60	100	200	129.50	23.894
DURATION OF HOSP. STAY	60	6	9	7.47	.833
Valid N (listwise)	60				

Comparative Results

The statistical data was collected from the pre-operative echo, the echo taken at the time of discharge and the early outcome was determined by the echo taken during the three month follow up of the patient.

The comparisons were made between

Pre-op and post-op NYHA class
Change in severity of MR (pre-op, post-op and 3 month)
Change in gradient (Peak and Mean Gradient) in MS (pre-op, post-op and 3 month)
Change in PA pressures (Pre-op and post-op)
Change in ejection fraction (pre-op, post-op and 3 month)

The results were analysed using Chi-square test and P-value was determined for each and is given below.

NYHA class

			Severity in MR - POSTOP					**Total**
			TRIVIAL	**MILD**	**MODERATE**	**SEVERE**	**NO**	
Severity in MR – PREOP	MODERATE	Count	4	10	0	0	0	14
		% of Total	9.8%	24.4%	.0%	.0%	.0%	34.1%
	SEVERE	Count	6	8	6	2	5	27
		% of Total	14.6%	19.5%	14.6%	4.9%	12.2%	65.9%
Total		Count	10	18	6	2	5	41
		% of Total	24.4%	43.9%	14.6%	4.9%	12.2%	100.0%

Table:6
NYHA class pre-op Vs post-op

			POST OP NYHA		**Total**
			I	**II**	
PRE-OP NYHA	**III**	Count	34	10	44
		% of Total	56.7%	16.7%	73.3%
	IV	Count	10	6	16
		% of Total	16.7%	10.0%	26.7%
Total		Count	44	16	60

Table:7
Severity in MR – PREOP Vs Severity in MR – POSTOP

Table:8
NYHA class pre-op Vs post-op

			POST OP NYHA		**Total**
			I	**II**	
PRE-OP NYHA	**III**	Count	34	10	44
		% of Total	56.7%	16.7%	73.3%
	IV	Count	10	6	16
		% of Total	16.7%	10.0%	26.7%
Total		Count	44	16	60

P-Value = 0.253

Severity of MR

P-Value = 0.032

The severity of Mitral regurgitation of pre operative and post operative was compared. Of the 60 patients, 14 (34.1%) had moderate MR pre-op and in the post op echo, 10 had mild MR and 4 had trivial MR. 27(65.9%) patients had severe MR pre operatively out of whom 6 had moderate MR, 8 had mild MR, 6 had trivial MR and 5 had

no MR. Two patients were found to have severe MR on POD 1 during screening echo in the ICU. Both patients were immediately shifted to the OR and re-explored. both patients, the neo-chordae were found to have given way. Fresh neo-chordae were placed and the procedure was completed.

The P- value was 0.032, which was clinically significant.

Table:9. Table:11

Severity in MR – POSTOP Vs Severity in MR - 3 MONTHS							
			Severity in MR - 3 MONTHS				Total
			TRIVIAL	MILD	MODERATE	NO	
Severity in MR - POSTOP	TRIVIAL	Count	8	2	0	0	10
		% of Total	19.5%	4.9%	.0%	.0%	24.4%
	MILD	Count	0	18	0	0	18
		% of Total	.0%	43.9%	.0%	.0%	43.9%
	MODERATE	Count	0	0	6	0	6
		% of Total	.0%	.0%	14.6%	.0%	14.6%
	SEVERE	Count	0	2	0	0	2
		% of Total	.0%	4.9%	.0%	.0%	4.9%
	NO	Count	0	0	0	5	5
		% of Total	.0%	.0%	.0%	12.2%	12.2%
Total		Count	8	22	6	5	41
		% of Total	19.5%	53.7%	14.6%	12.2%	100.0%

Comparison of the severity of MR in immediate post-op and during three month follow up showed no change in the mild, moderate and no MR groups. Of the 10 (24.4%) patients with trivial MR, 2 had mild MR, the other 8 remained unchanged.

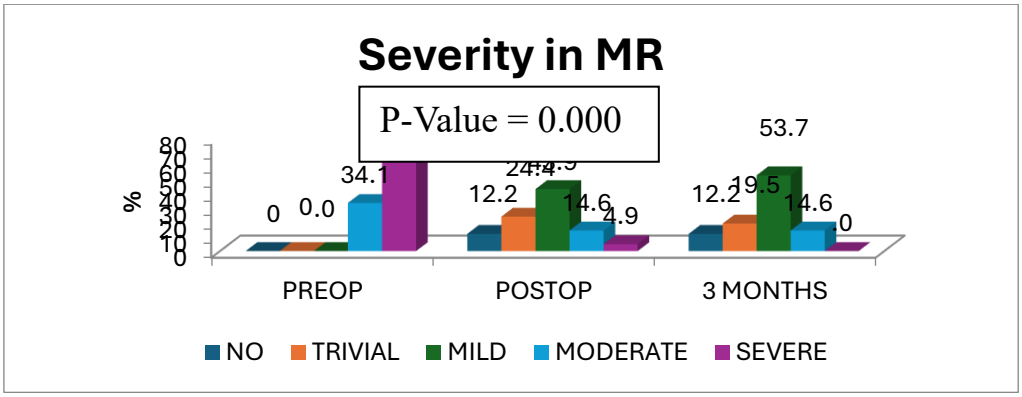

Figure:9

The above bar diagram shows the comparison between the severity of MR in pre-op, post-op and three-month follow-up echo.

Post-operative MR of moderate severity was accepted given the fact the patient was symptomatically in NYHA class I or II. These patients were monitored closely for any increase in symptoms or echocardiography changes.

Change in Gradient (Peak and Mean gradient)

Table:10
Peak gradient

	Mean	N	Std. Deviation
PG - PREOP	20.52	21	4.708
PG - POSTOP	7.00	21	1.817
PG - 3 MONTHS	7.05	21	1.830

P- Value
Pre – op Vs Post –op = 0.000
Post- op Vs 3 month = 0.329

The change in peak gradient from pre-op echo to post-op echo had a P-Value of 0.000 which is statistically very significant. Also, the change in peak gradient from the post-op and 3-month echo had a P-Value of 0.329, which was statistically not significant. This also means that there was no significant increase in the gradient during the 3 moths follow up. This is clinically significant.

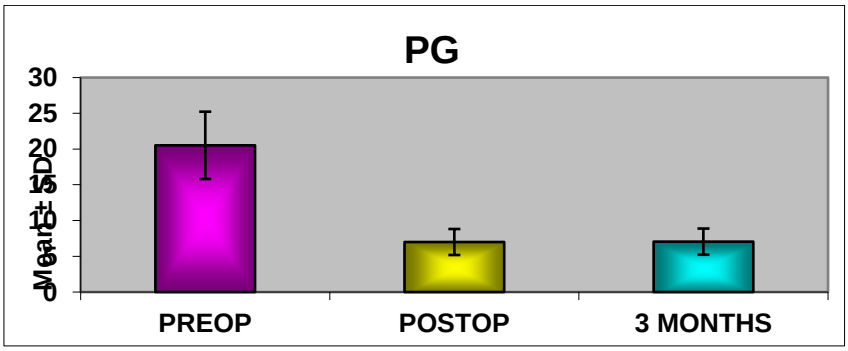

Figure:10

Table:11
Mean gradient

	Mean	N	Std. Deviation
MG - PREOP	13.86	21	3.719
MG - POSTOP	3.52	21	1.327
MG - 3 MONTHS	3.57	21	1.363

P-Value
Pre-op Vs Post-op = 0.000
Post-op Vs 3 month = 0.576

The change in Mean gradient from pre-op to post-op echo had a P-Value of 0.000 which is statistically very significant. The change from post-op to 3-month echo had a P-Value of 0.576 which even if not statistically significant, was clinically significant for the same reason stated earlier for the peak gradient.

Figure:11

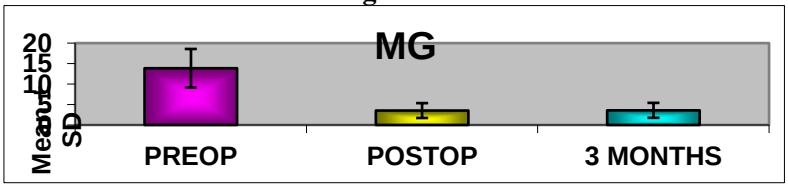

Table:12
Mean PA pressures

	Mean	N	Std. Deviation
Mean PA Pressure(mmHg) - PREOP	35.30	60	12.071
Mean PA Pressure - POSTOP	30.73	60	6.666

P-Value = 0.000

The Mean PA pressures had a significant decrease in the post operative period from a mean of 35.30mmHg to 30.73mmHg. The P-Value was 0.000 which is statistically significant.

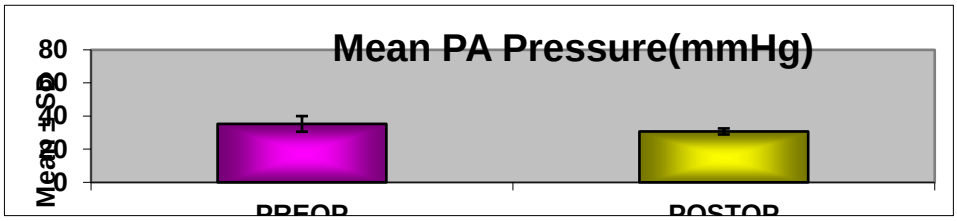

Figure:2

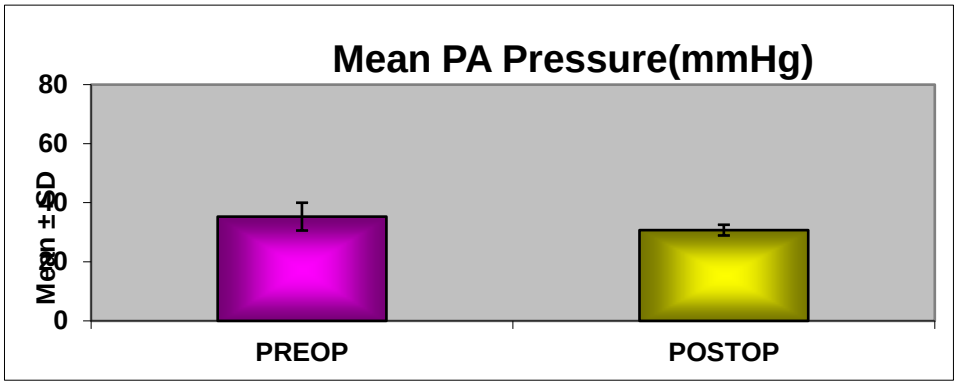

Table:13
Ejection Fraction

	Mean	N	Std. Deviation
EF% - PREOP	54.38	60	7.850
EF % - POSTOP	55.92	60	6.413
EF% - 3 MONTHS	58.32	60	5.721

P-Value
Pre-op Vs Post-op = 0.006
Post-op Vs 3 month = 0.000

The Ejection fraction had a significant increase in the post operative and also in the 3-month follow-up echo. The P-Value of Pre-op Vs Post-op EF% was 0.006 and that of Post-op Vs 3-month Echo was 0.000. Both were statistically significant and also proving that the left ventricular remodelling was significant and function improved in the immediate and early post operative periods

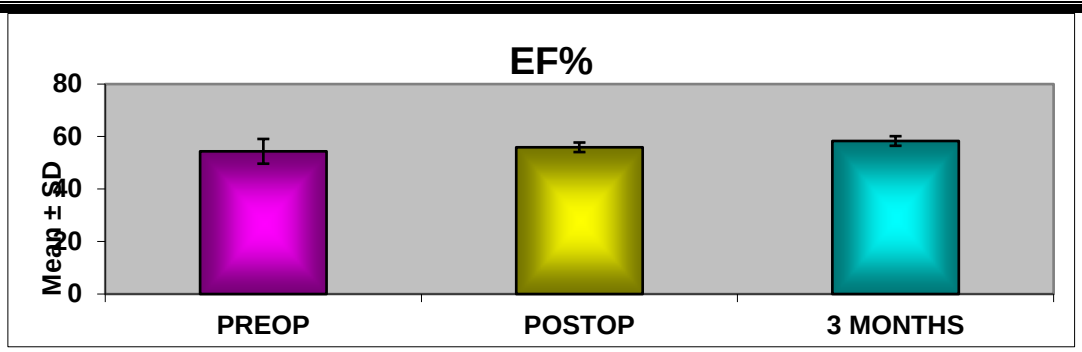

Figure:13

DISCUSSION

Mitral valve repair is preferred whenever technically feasible over valve replacement. Mechanical and biologic prosthetic heart valves have distinct disadvantages. Anticoagulation is required to prevent thromboembolic complications for mechanical valves, and porcine valves have a relatively short life expectancy (7 to 14 years) [49]

Mitral valve repair has become the standard of care for degenerative lesions of the mitral valve. However, in developing countries like India, Rheumatic valvular disease is the most common aetiology.

Rheumatic valves present with a complex morphology with fibrosis, retraction, calcification, sub valvular disease etc. In addition to this they also pose the threat of progressive deterioration of the valve and sub valvular apparatus with time. This poses a major problem during valve repair.

In patients with mitral stenosis, conservative surgery—that is, commissurotomy—provides both low operative risk and excellent late survival, with a low incidence of valve-related complications [21].
Thus, in this setting, conservative surgery, if feasible, has always been the preferred option. Conservative surgery (valve repair) has also been attempted for mitral regurgitation since the early days of cardiac surgery [50,51] but the results have been more inconsistent because the lesions of mitral regurgitation are more complex and difficult to correct as described above. The techniques of repair of regurgitant lesions have progressively improved. The durability of valve repair also has been well demonstrated [52,53,54].

Our study aims at determining the immediate post operative outcome and also early post operative outcome of mitral valve repairs done in our institution during the study period by comparing certain prognostic indicators like NYHA class, mean PA pressures, EF% etc.

In a Multivariate analysis by Maurice Enriquez-Sorano et al [55] they showed valve repair was an independent predictor of higher postoperative ejection fraction (*P*=.001; odds ratio of ejection fraction ≥50%, 2.72; 95% confidence interval, 1.43 to 5.16). This was consistent with our study with a P value of 0.006 for pre op and post op EF% and a P value of 0.000 for post op and 3 month follow up EF%.

In the same study the overall survival after valve repair was significantly superior to that after valve replacement (*P*=.0004), with 5- and 10-year survival rates, respectively, of 83±3% and 68±6% (repair) compared with 69±3% and 52±4% (replacement). At 10 years, the survival after valve repair represents 100% (*P*=.64) of the expected survival, and after replacement it is 77% (*P*=.0001) of expected. With multivariate analysis, valve repair was an independent favourable predictor of overall survival (*P*=.00001; hazard ratio, 0.39; 95% confidence interval, 0.26 to 0.60). In our study we did not have any in hospital mortality or early mortality for up to three months. However, the study was limited to a follow up period of three months and long-term survival rates could not be calculated.

Steven F. Bolling et al [56] showed that the NYHA failure class significantly fell for every patient individually and from a mean of 3.9 ± 0.2 to 1.8 ± 0.4 for the entire group. This was contrasting to our study as we did not have a statistically significant P value for the change in NYHA class. (P-Value = 0.253)

In the same study the average duration of cardiopulmonary bypass was 124 ± 24 minutes (range 66 to 198 minutes), with an aortic cross clamp time of 71 ± 11 minutes (range 51 to 123 minutes). This was also comparable to our study with a CPB time of 95± 35 minutes (range 38 to 210 minutes) and aortic cross clamp time of 65± 28 minutes (range 20 to 156 minutes)

A Marc Gillion et al [57] in a study of 1072 patients undergoing isolated mitral repair showed 30 patients required late reoperation for recurrent mitral valve regurgitation. 16 of these (53%) had repair failure because of progression of degenerative valve disease. 13 patients (43%) had reoperation within 1 year. In our study, 2 patients had re-operations on the first post operative day both of which was due to a neo chordae getting detached.

The study by A Marc Gillion et al [57] also showed valve pathology influenced the risk of reoperation only during

the early hazard phase. Patients with isolated anterior leaflet prolapse had an increased early risk of reoperation when compared with those with posterior leaflet prolapsed however, after 1 year, the instantaneous risk of valve failure was similar between patients with anterior leaflet prolapse and those with posterior leaflet prolapse. Valvular calcification had no impact on the risk of reoperation. Repair techniques influenced the risk of reoperation in both the early and late hazard phases. The risk of early repair failure was increased by chordal shortening and the requirement for additional sutures in the valve leaflets to increase leaflet coaptation. When compared with all other procedures, the technique of ring annuloplasty and leaflet resection was associated with decreased risk of reoperation in the late hazard phase. Correspondingly, the risk of reoperation was increased in those patients who had chordal procedures without leaflet resection, annuloplasty alone, or leaflet resection without annuloplasty. Late durability was enhanced by intraoperative echocardiography.

This finding was also true in our study as both the reoperations were done on patients who underwent chordal procedures and both had anterior leaflet prolapse.
The lower operative mortality after valve repair in the present study is consistent with previous observations [(58)]. However, since left ventricular dysfunction is the major cause of late death after mitral valve surgery [(59)], the lower mortality rate in patients with valve repair is readily understandable: after valve repair, postoperative ejection fraction is significantly higher and the incidence of death due to left ventricular dysfunction is reduced. Although this phenomenon is in part related to a better preoperative function, it also is an intrinsic effect of valve repair.

Our study also has compared the change in mean PA pressures in the pre operative and post operative period. This also showed a significant decrease of mean PA pressures post operatively (P-Value = 0.000) indicating the efficacy of the procedure.

CONCLUSION

Valvular heart disease has become a major health problem in our country, owing to the increased incidence of rheumatic fever as an aetiology. Rheumatic fever is still endemic in rural India, causing 25-40% of all acquired heart disease in children & adolescent. RHD is the commonest cause of acquired heart disease in children and mitral valve most commonly affected valve.

Traditionally most patients underwent mitral valve replacement for this condition but the morbidity and mortality was significant due to valve related and anticoagulation related complications.

Balloon mitral valvotomy (BMV) was also done, but it had its own restriction in mixed lesions where mitral valve repair became necessary, also BMV could not be performed in patients with mitral regurgitation.

Most surgeons have started adapting mitral valve repair techniques due to the fact that preservation of valve helps in improved cardiac function. Also marked progress in the surgical techniques has proved to be more and more effective in increasing the outcome of the procedure.

Mitral valve repair has proved to have lower incidence of bleeding or thrombo-embolic events and hence significantly reducing morbidity and mortality.

Mitral valve repair has proved to be superior to mitral valve replacement in all age groups and any underlying aetiology.
In our experience, we have seen that mitral valve repair can be done in all age groups with any underlying aetiology to most patients. It can be performed with low operative mortality and is easily reproducible. Incidence of valve related complications and sudden death is significantly reduced, although there was some incidence of reoperation. Also with a mean ventilation time of 9 hours and mean hospital stay of 7 days, the patients also have a faster recovery time and return to normal activity sooner. Valve repair could not be performed only for patients with severe calcification of the leaflets and with severe sub-valvular fusion
.
We conclude the study by saying that mitral valve repair can be successfully performed for nearly all types of lesions and age groups with good outcomes and also preserving the native valve so that post operative complications are reduced.
Valve preservation surgery is always better than valve replacement surgery.

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