reduction was associated with a significant decrease in postoperative atrial fibrillation and greater reduction in left atrial size with improved ejection fraction, without significant differences in operative time, postoperative bleeding, ICU stay, hospital stay, or overall complication rates.

The baseline characteristics of our study cohort were comparable between patients undergoing mitral valve replacement (MVR) alone (Group A) and those receiving concomitant left atrial (LA) reduction (Group B), with no significant differences in age, sex distribution, BMI, or NYHA functional class. Rheumatic etiology was the predominant cause of mitral valve disease in both groups (Group A: 86.7%; Group B: 80.0%), consistent with findings reported in patients with giant left atrium (GLA) undergoing surgery.[5] Preoperative atrial fibrillation (AF) was highly prevalent (80.0% in Group A and 73.3% in Group B), reflecting the well-established association between GLA and AF. Operative trends, including slightly longer aortic cross-clamp and cardiopulmonary bypass times in the LA reduction group, align with observations showing prolonged operative times in patients undergoing LA volume reduction without a significant increase in early mortality or overall complications.[21] Indications for surgery were similarly distributed, including mitral stenosis, mitral regurgitation, combined MS + MR, and re-stenosis, demonstrating that LA reduction can be safely performed across various mitral pathologies while maintaining favorable baseline characteristics.

Postoperative monitoring revealed a marked reduction in AF among patients who underwent LA reduction. Preoperatively, AF was present in 80.0% of Group A and 73.3% of Group B ($p = 0.666$). At 1 month, AF persisted in 80.0% of Group A versus 53.3% of Group B ($p = 0.121$), and by 3 months, prevalence decreased to 73.3% and 33.3%, respectively ($p = 0.028$), corresponding to percentage changes of 8.7% and 54.5%. These findings are consistent with studies reporting significantly higher long-term freedom from AF in patients undergoing aggressive LA volume reduction (3-year freedom from AF: 74.3% vs ~33.2%).[21] This supports the strategy of atrial remodeling during MVR to reduce AF burden postoperatively.

Echocardiographic assessment demonstrated significant LA diameter reduction, particularly in the LA reduction group (pre-op: 62.07 ± 3.45 mm; 3 months: 43.20 ± 1.52 mm; $p < 0.001$), with concomitant improvement in left ventricular ejection fraction (pre-op: 52.67 ± 1.59%; 3 months: 63.87 ± 2.56%; $p < 0.001$). These results align with reports describing marked reductions in LA size following LA reduction during mitral valve surgery, and studies emphasizing that surgical intervention for GLA generally promotes regression of LA volume, improved hemodynamics, and enhanced functional recovery.[22,23]

Operative details in our study showed a trend toward longer aortic cross-clamp (32.1 ± 5.6 vs 28.4 ± 4.9 min; $p = 0.084$) and cardiopulmonary bypass times (57.1 ± 6.9 vs 51.7 ± 8.8 min; $p = 0.072$) in the LA reduction group, while postoperative bleeding remained within an acceptable range (411.3 ± 42.4 ml vs 385.3 ± 39.9 ml; $p = 0.095$). These findings are consistent with reports describing considerable operative times for LA reduction, and studies noting that GLA does not significantly affect early operative outcomes, confirming that MVR with LA reduction can be safely performed despite longer operative durations.[22]

The analysis of postoperative ICU and hospital stay in the present study demonstrated no significant differences between Group A (MVR only) and Group B (MVR with LA reduction), with mean ICU stays of 5.25 ± 0.46 versus 5.02 ± 0.49 days ($p = 0.195$) and hospital stays of 8.93 ± 1.22 versus 8.52 ± 1.51 days ($p = 0.420$), respectively. These findings are consistent with reports comparing various left atrial reduction techniques in patients with giant left atrium and showing that optimized volume reduction strategies are associated with reduced ICU stay and hospitalization, highlighting that carefully executed LA reduction does not adversely prolong early recovery.[24] Similarly, studies have noted that although excessive atrial enlargement is generally associated with increased postoperative morbidity, it does not uniformly extend