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SUCCESSFUL TERM PREGNANCY FOLLOWING PREVIOUS PERCUTANEOUS MITRAL BALLOON COMMISSUROTOMY FOR RHEUMATIC HEART DISEASE: A CASE REPORT

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ABSTRACT **Background:** Rheumatic heart disease remains an important cause of cardiovascular morbidity in women of reproductive age in many low- and middle-income countries. Pregnancy can unmask or worsen the haemodynamic consequences of rheumatic mitral stenosis because of increased blood volume and cardiac output. Percutaneous mitral balloon commissurotomy/valvuloplasty (PMBC/PMBV) is an established treatment for suitable rheumatic mitral stenosis and may substantially improve functional status before pregnancy. **Case presentation:** A 32-year-old primigravida at 38 weeks of gestation with rheumatic heart disease and previous mitral balloon valvuloplasty performed in 2023 for severe rheumatic mitral valve disease was admitted for planned institutional delivery. She had remained clinically stable throughout pregnancy under cardiology and obstetric follow-up and received aspirin and penicillin prophylaxis. Echocardiography demonstrated mild residual mitral stenosis, mild mitral regurgitation, Grade I left ventricular diastolic dysfunction, mild tricuspid regurgitation, moderate pulmonary artery hypertension and preserved left ventricular systolic function (ejection fraction 60%). Multidisciplinary assessment supported planned institutional delivery with continuous maternal cardiovascular and fetal surveillance. A male infant weighing 2.9 kg was delivered with satisfactory immediate neonatal adaptation. The mother underwent 24-hour intensive care observation and had an uncomplicated postpartum course. Mother and newborn were discharged in stable condition on the tenth postnatal day. **Conclusion:** Favourable pregnancy outcomes may be achieved after successful mitral balloon valvuloplasty in women with rheumatic heart disease when residual valve disease is clinically compensated and ventricular systolic function is preserved. Pre-pregnancy intervention, individualized risk assessment, serial echocardiographic surveillance, multidisciplinary planning and close postpartum monitoring remain central to safe care.

KEYWORDS : rheumatic heart disease; rheumatic mitral stenosis; percutaneous mitral balloon commissurotomy; pregnancy; pulmonary hypertension; multidisciplinary care; case report

INTRODUCTION

Rheumatic heart disease (RHD) remains an important cause of acquired valvular heart disease among women of reproductive age, particularly in low- and middle-income countries. Mitral valve involvement is the predominant lesion and clinically significant mitral stenosis may become poorly tolerated during pregnancy because the physiological rise in cardiac output increases transmitral flow and left atrial pressure.

Percutaneous mitral balloon commissurotomy (PMBC), also termed percutaneous mitral balloon

valvuloplasty (PMBV), is an established treatment for anatomically suitable rheumatic mitral stenosis. Contemporary guidelines emphasize intervention before pregnancy when clinically severe stenosis is present and recommend PMBC during pregnancy for selected women who remain symptomatic or have significant pulmonary hypertension despite medical treatment.

Pregnancy after successful PMBC is generally associated with improved functional status and favourable

maternal and fetal outcomes compared with untreated severe mitral stenosis. Nevertheless, residual mitral valve disease, pulmonary hypertension, left atrial enlargement and ventricular dysfunction may continue to influence maternal risk, particularly during late pregnancy and the early postpartum period.

We report the course of a 32-year-old primigravida with previous PMBV for severe rheumatic mitral disease who completed pregnancy to term despite residual mild mitral stenosis, mild mitral regurgitation, Grade I left ventricular diastolic dysfunction and moderate pulmonary artery hypertension. The case illustrates the practical importance of individualized surveillance and coordinated obstetric-cardiology care in a rural tertiary-care setting.

Case Presentation

Patient history

A 32-year-old primigravida presented to the Department of Obstetrics and Gynecology, B.K.L. Walawalkar Rural Hospital, Dervan, Ratnagiri, Maharashtra, at 38 weeks of gestation for planned institutional delivery.

She had a known diagnosis of rheumatic heart disease and had undergone mitral balloon valvuloplasty in 2023 for severe rheumatic mitral valve disease before conception. Following the intervention, she remained under regular cardiology follow-up and had satisfactory functional recovery.

During pregnancy, she received aspirin and penicillin prophylaxis under cardiology supervision. The antenatal course was uneventful, without reported symptoms suggestive of heart failure, worsening dyspnoea, syncope or arrhythmia, and pregnancy progressed to term.

Clinical examination

At admission, she was conscious, cooperative and haemodynamically stable, with no clinical evidence of respiratory distress or peripheral signs of cardiac failure. Obstetric examination showed a term-size uterus with longitudinal lie and cephalic presentation. The fetal head was floating and fetal heart rate was 146 beats/minute. Vaginal examination showed a fingertip-dilated cervix with approximately 10–20% effacement, consistent with the latent phase of labour.

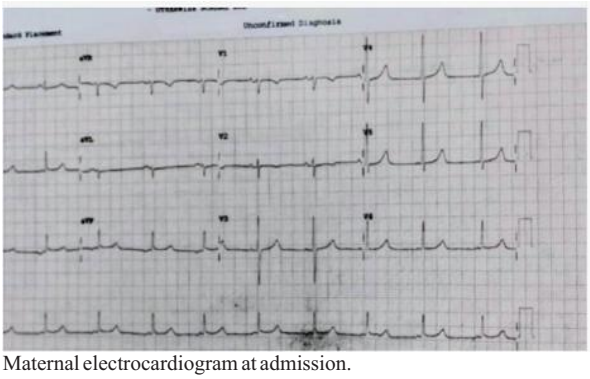
Cardiac assessment

Transthoracic two-dimensional echocardiography demonstrated mild residual mitral stenosis with mild mitral regurgitation. The left atrium was dilated and a minimal pericardial effusion was present. Grade I left ventricular diastolic dysfunction was noted, while left ventricular systolic function was preserved with an ejection fraction of 60%. Mild tricuspid regurgitation and moderate pulmonary artery hypertension were also reported. Despite these residual abnormalities, there was no clinical evidence of cardiac decompensation.

Investigations

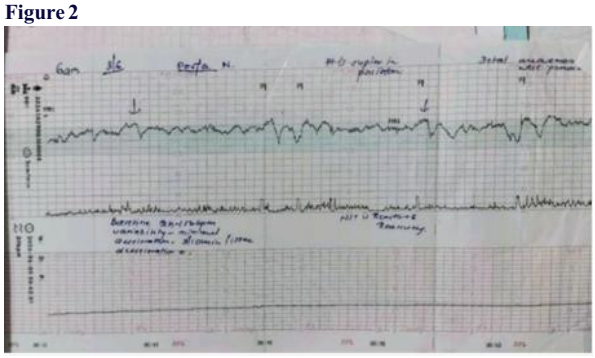
Routine antenatal laboratory investigations, electrocardiography, transthoracic echocardiography and obstetric ultrasonography were performed. Continuous fetal surveillance during labour demonstrated reassuring fetal status without evidence of compromise.

figure 1



Maternal electrocardiogram at admission.

Figure 2



Non-stress test demonstrating reassuring fetal status at term.

Final diagnosis

Term singleton pregnancy at 38 weeks in a primigravida with rheumatic heart disease status post mitral balloon valvuloplasty, residual mild mitral stenosis and mild mitral regurgitation, Grade I left ventricular diastolic dysfunction, mild tricuspid regurgitation, moderate pulmonary artery hypertension, preserved left ventricular systolic function (ejection fraction 60%), and clinically compensated maternal cardiac status.

Multidisciplinary management and delivery

Management was coordinated among the obstetric, cardiology, anaesthesiology and neonatal teams. A planned institutional delivery was undertaken with continuous maternal cardiovascular and fetal monitoring. Cardiac medications were continued during the peri-partum period and close haemodynamic observation was maintained to detect cardiovascular instability. The patient remained haemo-dynamically stable throughout labour and delivery without documented cardiac or obstetric complications.

Maternal and neonatal outcome

A male infant weighing 2.9 kg was delivered with satisfactory immediate neonatal adaptation. The mother was observed in the intensive care unit for 24 hours because of her underlying rheumatic heart disease and previous mitral balloon valvuloplasty. The postpartum course was uncomplicated, with no documented heart failure, arrhythmia, thromboembolic event or worsening valvular dysfunction. The neonate remained clinically stable. Mother and newborn were discharged in stable condition on the tenth postnatal day.

DISCUSSION

The principal clinical message from this case is that successful term pregnancy is possible after effective treatment of rheumatic mitral stenosis, even when residual valve abnormalities and pulmonary hypertension persist. The patient's favourable outcome was associated with preserved LV systolic function, clinical compensation, absence of reported heart failure or arrhythmia, prior correction of severe mitral stenosis, and coordinated multidisciplinary surveillance.

Pregnancy increases plasma volume, stroke volume and heart rate, thereby increasing transmitral flow and potentially worsening symptoms in women with mitral stenosis. Clinically significant rheumatic mitral stenosis is therefore associated with substantial maternal risk. In the ROPAC cohort of women with rheumatic mitral valve disease, approximately half of women with severe mitral stenosis developed heart failure during pregnancy, underscoring the importance of pre-pregnancy optimization and close follow-up.

Contemporary European guidance recommends pre-pregnancy intervention for clinically severe rheumatic mitral stenosis when appropriate. During pregnancy, percutaneous mitral commissurotomy remains the principal intervention for selected patients who remain in NYHA functional class III/IV or have significant pulmonary pressure elevation despite medical therapy. Vaginal delivery is generally preferred when the clinical condition permits, while delivery planning should be individualized in women with severe stenosis, pulmonary hypertension or refractory heart failure.

Previous PMBV can materially alter the trajectory of pregnancy by relieving the fixed mitral obstruction before conception. Published series have demonstrated substantial improvement in functional status after PMBV and generally favourable pregnancy outcomes. Contemporary data also continue to support the effectiveness of PMBC in appropriately selected pregnant women with severe rheumatic mitral stenosis.

In the present case, the residual mitral stenosis was described as mild and LV systolic function remained preserved at 60%. Nevertheless, the presence of left atrial dilatation, Grade I LV diastolic dysfunction and moderate pulmonary artery hypertension justified continued specialist surveillance. The absence of clinical decompensation despite these findings highlights the importance of integrating echocardiographic abnormalities with functional and clinical status rather than using a single parameter in isolation.

The postpartum period deserves particular attention in women with rheumatic mitral disease because rapid haemodynamic shifts after delivery can precipitate heart failure. The decision to provide 24-hour intensive care observation in this case reflects this recognized period of vulnerability. No postpartum cardiovascular complication was documented.

The case also illustrates the relevance of specialist cardiac care in rural tertiary healthcare. Access to pre- pregnancy intervention, continued cardiology follow-up and coordinated peripartum planning can permit women with previously severe rheumatic valve disease to achieve favourable pregnancy outcomes even when residual abnormalities remain.

STRENGTHS AND LIMITATIONS

The strength of this report lies in the complete clinical trajectory from previous mitral balloon valvuloplasty through term pregnancy and postpartum recovery in a rural tertiary-care setting. It provides a practical example of multidisciplinary management in a patient with residual valve disease and pulmonary hypertension.

The report is limited by its single-patient design and therefore cannot establish the safety or efficacy of a particular management strategy. The available record also does not provide serial quantitative mitral valve area, transmitral gradient, exact pulmonary artery pressure, detailed right ventricular parameters, or a formal longitudinal functional-class assessment. These limitations should be acknowledged when interpreting the case.

Clinical Learning Points

- Successful pregnancy may occur after effective pre-pregnancy treatment of severe rheumatic mitral stenosis.
- Residual mitral valve disease and pulmonary hypertension warrant continued specialist surveillance even when the patient is clinically asymptomatic.
- Pregnancy risk assessment should integrate symptoms, functional status, echocardiographic findings and previous cardiac inter-vention.
- Multidisciplinary Pregnancy Heart Team planning is central to safe peripartum care in women with significant rheumatic valve disease.
- The early postpartum period remains a haemodynamically vulne-rable interval and merits structured cardiovascular observation.

CONCLUSION

This case demonstrates that a favourable maternal and neonatal outcome can be achieved after mitral balloon valvuloplasty for rheumatic mitral stenosis when residual disease is clinically compensated and ventricular systolic function is preserved. The case

reinforces the importance of pre-pregnancy optimization, individualized risk stratification, serial cardiovascular surveillance, multidisciplinary delivery planning and structured postpartum monitoring. In settings where rheumatic heart disease remains prevalent, strengthening access to specialist cardiac intervention and coordinated pregnancy-heart-team care may have substantial implications for maternal health.

Declarations

- **Ethics approval:** Institutional Ethics Committee approval was obtained for publication of the case.
- **Consent for publication:** Written informed consent was obtained from the patient for publication of anonymized clinical information.
- **Conflict of interest:** None declared.
- **Funding:** None.
- **Authors' contributions:** All authors contributed to clinical care, interpretation of the case, manuscript preparation and approval of the final manuscript.

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