

Concomitant Planned Caesarean section and Mitral Valve Replacement with successful Maternal and Fetal outcome

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Abstract

A 22 year old female with severe calcified mitral stenosis with moderate PAH (grade 4 NYHA) presented at 28 weeks of gestation. Patient was referred from a cardiologist for immediate caesarean and cardiac surgery for severe pulmonary hypertension. A multidisciplinary team including cardiologist, cardiac surgeon and obstetrician decided to assist the parturient in continuing her pregnancy under close monitoring till 35-36 weeks of gestation. At term, the patient underwent a successful elective cesarean section followed by concomitant mitral valve replacement under cardiopulmonary bypass. A live healthy female child weighting 1.67 kg was delivered and shifted to NICU. It was a real challenge to continue pregnancy with critical mitral stenosis (size = 0.6 cm²), fortunately both fetal and maternal outcome were excellent. Both mother and child were discharged from the hospital after an uneventful post-operative recovery.

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Introduction

Cardiac diseases occur in 2-4% of pregnancies and rheumatic mitral stenosis is the most common acquired heart disease in pregnancy [1]. Patient is symptomatic when the size of mitral valve is less than 1cm²[2].

Valvular repair or replacement during pregnancy is indicated in selected patients who remain symptomatic despite adequate medical therapy [3]. Pregnancy with critical mitral stenosis fail to tolerate the cardiovascular demand of pregnancy (increase volume load and tachycardia) leading to pulmonary hypertension and an advancing New York heart association (NYHA) class, specially just after delivery of baby [4]. Hence a concomitant caesarean section and mitral valve replacement was planned in this case.

Background

(CPB) Cardio pulmonary bypass during pregnancy is associated with a maternal mortality rate similar to that of a non-pregnant female (3-15%), however, fetal mortality remains high at about 9-30% [5, 6, 7].

During pregnancy there is significant increase in blood volume and cardiac output (40-50%) compared to non-pregnant values. Soon after delivery cardiac output increases as much as 80% above normal state due to increase in venous return as a result of removal of aorto-caval compression as well as auto-transfusion of blood to central vein by contracted uterus. Already compromised (haemodynamically) patient with mitral stenosis, at this stage becomes more vulnerable to develop pulmonary edema.

Case Report

A 22 year old female patient was admitted at GMCH with 28 weeks pregnancy with RHD, severe calcific MS, with complains of

dyspnea at rest, chest pain, palpitations and pedal as well as facial edema since 2 months. She was referred from a cardiologist for signs of severe pulmonary hypertension to our hospital.

Obstetrical History

Gravida 3 Abortion 2 (both 1st trimester)

Physical Examination

Pulse: 76/min, B.P:110/70 mm Hg, conscious oriented

Respiratory System: Bilateral air entry present

CVS: Mid-diastolic murmur, pre-systolic accentuation? Opening snap? Present.

Investigations

HB : 13gm% ,TLC: 10,000, Platelet: 2.71 lakh/cm, S.urea: 20.6mg/dl, S.creat: 0.56mg/dl, RBS: 88mg/dl, Na: 136.0mmol/lit, K: 4.2mmol/lit, PT/INR : 1.04, SGOT: 16 I.U./litre, SGPT: 15 I.U./litre, Total proteins: 6.89 gm/dl, ASO/CRP: negative, HIV, HBsAg, HCV-non-reactive, Chest X-ray:No abnormality, ECG: Sinus Rhythm 72/min

2D Echocardiography: RHD, Severe MS with mild MR, Normal LV function, LVEF: 55%, Aortic Valve thickened, Mild AR, No AS, Dilated LA, Mitral Valve area - 0.6 cm²

Patient had consulted gynecologist in 1st trimester and was advised MTP, but she refused termination of pregnancy.

She was kept under close supervision in our hospital for a period of 45 days. Close cardiac and fetal monitoring was done by a team of cardiologist, cardiac surgeon and obstetrician. During this period she was kept on diuretic and rate controlling drugs (Diltiazem, Evabradine, Torsamide, aspirin-75mg,) iron, calcium, and protein powder.

Fetus showed signs of mild IUGR and early uteroplacental insufficiency at the time of admission, close fetal monitoring was done by regular NST, color Doppler and DFMR.

She was put on complete bed rest, head end elevated, decreased fluid intake, once fetal maturity reached 36 weeks of gestation, she was planned for concomitant LSCS with mitral valve replacement after obtaining an informed consent. LSCS was done first and an alive female child, weight 1.67 kg was delivered and shifted to NICU followed by mitral valve replacement. Main concern from obstetrical point of view was uterine and intraoperative bleeding

as massive dose of heparin is being used during MVR procedure. We decided to keep abdomen open after uterine closure to watch closely for any hemorrhage during MVR surgery. Continuous IV oxytocin infusion was given to check uterine bleeding.

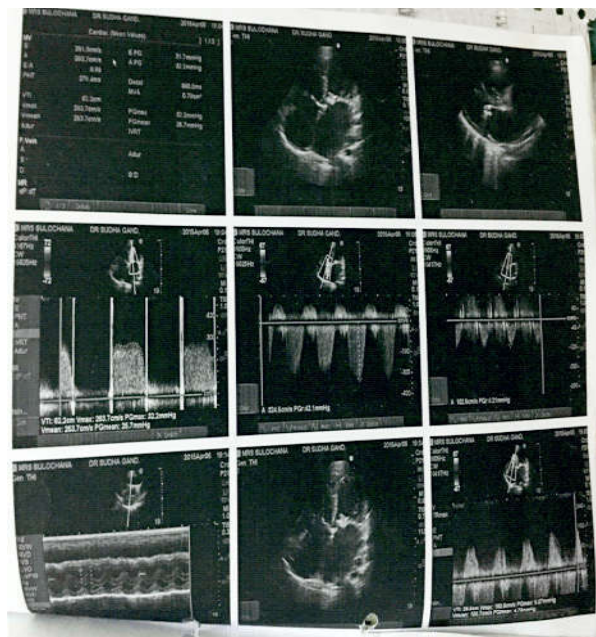


Image 1: Showing cardiac status of patient pre operatively.

Operative Findings

Normal systemic and pulmonary drainage.

Pulmonary artery: Severely tense.

Mitral Valve: Thickened cusps, Fused Commissures, Moderate subvalvular fusion present.

No Left atrium clot. Pericardium loosely approximated after surgery, Right pleura opened and right pleural drain was placed.

Course in Hospital

Postoperatively the patient was electively ventilated for 4-6 hours and then extubated. Her inotropic support was weaned off on the second postoperative day while her drains were removed on 4th post-operative day, she was ambulated on 5th day of surgery and after an uneventful recovery both mother and baby were discharged on 15th post-operative day.

Follow up Advice

On discharge, she was instructed to continue with deep breathing exercises and report back to hospital for regular check-ups.

Conclusion

Asymptomatic women with mild mitral stenosis can successfully carry pregnancy to term and have vaginal deliveries. However severe MS (Valve area < 1.0cm²) can result in rapid clinical deterioration and maternal and fetal mortality.

Cardiac surgery is usually not required during pregnancy and is best planned before conception or delayed until after delivery. Surgical intervention is required in patients refractory to medical management and can sometimes be lifesaving. An experienced team of cardiologist, cardiothoracic surgeon, obstetrician anesthesiologist, perfusionist and neonatologist is absolutely necessary to decrease maternal mortality and fetal mortality [8].

When planning concomitant caesarean section and mitral valve replacement issues which needs to be considered are risk of hypoxia to the fetus as a result of pre-existing intrauterine hypoxia and hypoxia secondary to placental transfer of general anesthetic drugs and muscle relaxants that decrease uterine blood flow or depress fetal respiration and risk of uterine bleeding (PPH) thereafter.

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