

Case of rheumatic heart disease and severe mitral stenosis, managed by balloon mitral valvuloplasty in pregnancy

Shailendra Singh

From Specialist, Department of Anesthesia, RAK Hospital, Ras Al Khaimah, United Arab Emirates

ABSTRACT

Mitral stenosis (MS) is a progressive situation caused by obstruction of blood flow across the mitral valve from the left atrium to the left ventricle. It is one of the most common valvular heart lesions found during pregnancy. The chances of significant maternal and fetal morbidity and mortality are more in the case of severe MS. Balloon mitral valvuloplasty (BMV) is a life-saving procedure in pregnancy instead of surgical correction. We are presenting the case of a 24-week pregnant woman with severe MS. She developed pulmonary edema and had undergone successful BMV which allowed her to tolerate her pregnancy decently. It leads to a decrease in the left atrial pressure as well as pulmonary arterial pressure. The patient underwent normal delivery uneventfully. Antibiotics were used with proper consultation and the patient was treated conservatively with excellent maternal and fetal outcomes. BMV is turns out to be a life-saving therapy for severe MS complicated by pulmonary edema.

Key words: Balloon mitral valvuloplasty, Mitral stenosis, Pregnancy, Rheumatic heart disease

Mitral stenosis (MS) is the most common valvular cardiac disease found during pregnancy and one of the most common health problems in developing countries. The physiological changes occurring during pregnancy such as the increased volume and heart rate are not easily tolerated by patients having moderate to severe MS [1]. Sometimes MS is diagnosed 1st time during pregnancy when it is poorly tolerated. When the gradient of MS is severe (mitral valve area is <1.5 cm square), atrial fibrillation and congestive heart failure-like situations are seen frequently, and this situation becomes even worse when the patient has poor functional status and severe pulmonary artery hypertension. In this situation, balloon mitral valvuloplasty (BMV) turns out to be a life-saving procedure.

Since MS is a life-threatening situation, more attention should be paid to the mother after a few days of delivery due to the increased risk of pulmonary edema. This case study helps to understand the current management of pregnant females with MS and the potential of BMV in more effective management.


CASE REPORT

A 36-year-old pregnant female was admitted to the intensive care unit (ICU) with complaints of shortness of breath and cough for

4 days along with bilateral swelling of limbs. She was diagnosed as a case of MS 11 years back during her first pregnancy. At the time of admission, the patient was on furosemide 40 mg once daily with metoprolol 25 mg once daily. She has a history of hypothyroidism and was on treatment.

On examination, the heart rate was increased and the patient showed signs of anemia. 2D echocardiogram (ECHO) showed a mitral valve area of 0.8 cm square, which was complicated by left heart failure, severe pulmonary arterial hypertension, dilated left atrium, and rheumatic heart disease, but the left ventricular function was normal. Electrocardiogram (ECG) showed left atrial enlargement. Chest X-ray showed that both lungs were clear with no focal parenchymal lesions.

Mitral valve surface area (cm²), Mitral Gradient (mmHg), and left arterial pressure (mmHg) were observed before valvuloplasty as 0.8, 17, and 30 and after valvuloplasty as 1.7, 8, and 13, respectively. Transesophageal echo was done under local anesthesia, and it showed no thrombus in the left atrium and left atrium appendages. ECG showed normal sinus rhythm. The patient was taken to the catheterization laboratory for BMV. The procedure was done under sedation successfully with an expanded mitral valve area of 1.7 cm². The patient was shifted out of the catheterization laboratory with vital signs stable. Left atrial pressure was measured after BMV which showed a decrease in the left atrial pressure from 30 mmHg to 13 mmHg. 2D ECHO was done after the procedure which showed the opening of the

Access this article online	
Received - 06 January 2023 Initial Review - 31 January 2023 Accepted - 09 March 2023	Quick Response code 
DOI: 10.32677/ijcr.v9i3.3940	

Correspondence to: Dr. Shailendra Singh, Department of Anesthesia, RAK Hospital, Ras Al Khaimah, United Arab Emirates. E-mail: drssingh2007@gmail.com

© 2023 Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC-ND 4.0).

mitral valve with a split of the anterolateral commissure. No mitral regurgitation (MR) was seen. The mitral valve gradient was 8 mmHg and mild tricuspid regurgitation was detected.

During the ICU stay, the patient's vitals were stable. After 2 days of observation, the patient was discharged with no complaints. The patient was seen by obstetricians regularly and an ultrasound abdomen was repeated with no fetal complications. The patient follow-up was done regularly. Cesarean delivery underwent smoothly without any complications at 37 weeks.

DISCUSSION

The incidence of infective endocarditis during pregnancy is rare with an incidence of approximately 0.006% and 0.5% among known valvular and congenital heart disease patients [2]. The pregnant patients associated with MS and falling under the categories of the New York Heart Association class III-IV have a mortality rate of approximately 5–15% [3]. In such circumstances, the mortality rates are high both in the mother (22.1%) and fetus (14.7%) [4].

Closed commissurotomy has a lesser mortality rate of 21%, while the fetal death rate is 1.2–8% along with the miscarriage rate of 5–15% [5]. Open valvotomy with extracorporeal circulation has a fetal mortality rate of 15–30% [6]. Pregnancy leads to a physiologic increase in blood volume and cardiac output around 30–50% at the beginning of the first trimester which peaks at 20–24 weeks of gestation [7,8]. During that time, untreated MS becomes symptomatic and carries high maternal risk.

In general, the complication rates of BMV are associated with a mortality rate of 0.5%, along with several other complications such as cerebrovascular accident (1%), cardiac perforation (1%), MR requiring surgery (2%), MR of any kind (15%), and atrial septal defect (10%) [8]. As seen in this case, BMV is comparatively easy and safe during pregnancy [1]. As surgical treatment done under general anesthesia can lead to a high fetus mortality rate of up to 33% [1], BMV is designated as a life-saving procedure, particularly when it is complicated by refractory pulmonary edema. In such cases, BMV is done as the patient had a recurrent episode of pulmonary edema.

After a successful balloon valvotomy, infective endocarditis should be managed very carefully as these antibiotics are very harmful to the fetus. Conservative medical management of symptomatic MS includes bed rest, sodium restriction, and medications. Beta-blockers are used to slow the heart rate and as prophylaxis for tachyarrhythmias. Diuretics are administered cautiously to treat volume overload. BMV is usually considered when medical management is unsuccessful. In many case reports,

we observed the safety and efficacy of this procedure during pregnancy.

After successful BMV, the management of infective endocarditis exposed many therapeutic challenges as the majority of antibiotics is harmful to the fetus. In this case, we used successfully selected antibacterial against coagulase-negative. Antibiotics such as vancomycin, imipenem, and rifampicin should be used very carefully as they lie in Group C of the food and drug association classification. Group D drugs such as aminoglycosides, quinolones, and tetracyclines have a definite risk during pregnancy; hence, they should be used only for real indications.

CONCLUSION

MS is the most commonly affecting cardiac condition in women during pregnancy. Medical management with selective beta-blockers and cautious use of diuretics is usually recommended for symptomatic relief in patients with MS. BMV is a life-saving procedure for patients with severe MS which is complicated by refractory pulmonary edema. It is also effective in controlling symptoms of congestive heart failure in severe MS who do not respond to medical management.

REFERENCES

1. Kannan M, Vijayanand G. Mitral stenosis and pregnancy: Current concepts in anaesthetic practice. *Indian J Anaesth* 2010;54:439-44.
2. Franklin WJ, Gandhi M. Congenital heart disease in pregnancy. *Cardiol Clin* 2012;30:383-94.
3. Anthony J, Osman A, Sani MU. Valvular heart surgery during pregnancy. *Cardiovasc J Afr* 2016;27:111-8.
4. Campuzano K, Roqué H, Bolnick A, Leo MV, Campbell WA. Bacterial endocarditis complicating pregnancy: Case report and systematic review of the literature. *Arch Gynecol Obstet* 2003;268:251-5.
5. Pavankumar P, Venugopal P, Kaul U, Iyer KS, Das B, Sampathkumar A, *et al*. Closed mitral valvotomy during pregnancy: A 20-year experience. *Scand J Thorac Cardiovasc Surg* 1988;22:11-5.
6. Bernal JM, Miralles PJ. Cardiac surgery with cardiopulmonary bypass during pregnancy. *Obstet Gynecol Surv* 1986;41:1-6.
7. Spaanderman ME, Meertens M, van Bussel M, Ekhart TH, Peeters LL. Cardiac output increases independently of basal metabolic rate in early human pregnancy. *Am J Physiol Heart Circ Physiol* 2000;278:H1585-8.
8. Thornburg KL, Jacobson SL, Giraud GD, Morton MJ. Hemodynamic changes in pregnancy. *Semin Perinatol* 2000;24:11-4.

Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Singh S. Case of rheumatic heart disease and severe mitral stenosis, managed by balloon mitral valvuloplasty in pregnancy. *Indian J Case Reports*. 2023;9(3):63-64.