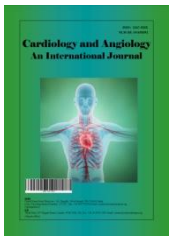

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Anterior Mitral Leaflet Tear during Balloon Mitral Valvotomy in a Case of Juvenile Mitral Restenosis

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Authors' contributions

This work was done in collaboration among all authors. Author RR managed the patient, did the initial literature search and wrote the first draft of the manuscript. Author GDG managed the patient. Author SSS assisted the case, supervised the management and reviewed the study. Author NOB performed the case and supervised the management. All the authors managed the literature search and writing of the final manuscript. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Recurrent attacks of rheumatic fever can lead to mitral stenosis. In a country like India mitral stenosis can develop in the first decade of life. Our patient presented with recurrent mitral stenosis at twelve years of age. He had undergone balloon mitral valvotomy at the age of seven. However this time he developed anterior mitral valve leaflet tear after balloon mitral valvotomy and had to be taken for mitral valve repair. Due to severe fibrosis of mitral valve the patient underwent mitral valve replacement. He was started on warfarin and dose titrated according to PT / INR. Patient was discharged but has to be on lifelong anticoagulation from the age of twelve.

Keywords: Anterior mitral leaflet tear; juvenile mitral stenosis; mitral valve replacement; rheumatic heart disease.

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ABBREVIATIONS

ECG : Electrocardiogram
PT/INR : Prothrombin Time / International Normalized Ratio
ASO : Anti Streptolysin O
CRP : C Reactive Protein
MR : Mitral Regurgitation
AML : Anterior Mitral Leaflet
BMV : Balloon Mitral Valvotomy

1. INTRODUCTION

Mitral stenosis was thought to evolve over decades as a part of rheumatic heart disease. However, the course in developing countries differs from that in developed countries. Studies from developed countries showed mitral stenosis to be a delayed manifestation of rheumatic heart disease and was supported by slow echocardiographic decline in valve area [1,2]. Congenital mitral stenosis is rare with high mortality in first few years of life with serious circulatory disturbances [3]. The worldwide prevalence of Rheumatic heart disease is 15.6 million with 282,000 new cases and 233,000 deaths each year [4,5]. Prevalence of rheumatic heart disease in India is 1 to 5.4 per 1000 school going children [6]. This case had presented with rheumatic mitral stenosis at the age of seven when he had undergone balloon mitral valvotomy and presented five years later at the age of 12 years with recurrent mitral stenosis.

2. PRESENTATION OF CASE

A 12-year-old male child presented with gradual onset, progressive breathlessness for 6 months associated with orthopnea and paroxysmal nocturnal dyspnea for 15 days. On admission, patient had blood pressure of 90/70 mm Hg and pulse rate of 90/min in normal sinus rhythm. The patient had fever with cough and sore throat on the day of admission which got relieved with medications within 3 days. On chest X ray, there was straightening of left heart border with right ventricular type cardiomegaly. On ECG, right ventricular hypertrophy with strain pattern was seen (Fig. 1).

On echocardiography, right atrium and right ventricles were dilated, peak/mean transmitral gradient was 37/18 mm Hg and mitral valve area by planimetry was 0.71 cm^2. Valve was mobile with restriction of leaflet tips, mid leaflet to margin thickening with minimal thickening of chordae just below the valve with scattered areas of calcification confined to leaflet margins resulting in a Wilkin's score of 6. Pulmonary artery systolic pressure by tricuspid regurgitation jet velocity was 96.3 mm Hg (Fig. 2). The tricuspid annular plane systolic excursion was 12.4 mm. His ASO titers were negative but CRP was positive.

The patient was taken for balloon mitral valvotomy using an Accura balloon no. 24, as patient's height was 129 cm and weight was 29 kg. Femoral artery and vein puncture were taken and venous and arterial sheaths were inserted. 5F Pig tail catheter was inserted into the aorta and aortic shoot was taken. Aortic pressure was 85/36 mm Hg with a mean of 60 mm Hg. Left ventricular systolic pressure was 85 mm Hg with end diastolic pressure of 10 mm Hg and left atrial pressure was 45/16 mm Hg with a mean of 24 mm Hg. Using multipurpose catheter pulmonary artery pressure was measured and found to be 70/45 mm Hg with a mean of 55 mm Hg. The valve was crossed with the balloon and was dilated with 23 ml diluted contrast following which the patient developed moderate MR with AML tear and the left atrial mean pressure increased to 30 mm Hg (Fig. 3). Post operatively patient was having a blood pressure of 76/60 mm Hg and pulse rate of 110/ min with no crepitations in the chest.

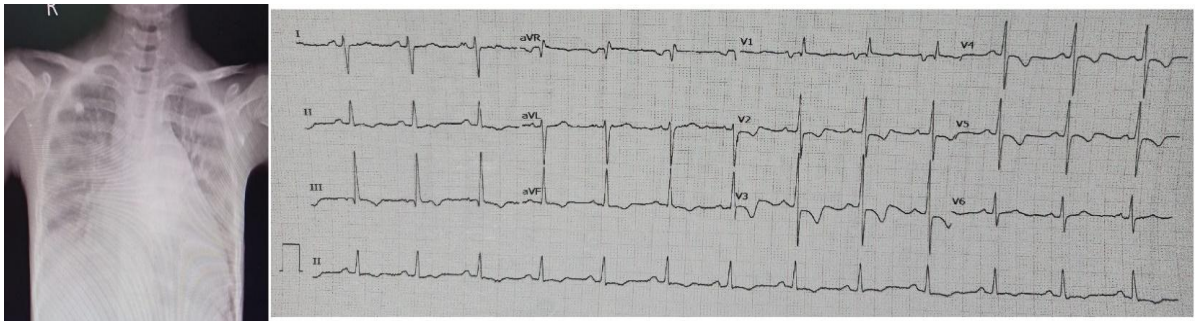

Fig. 1. Chest X ray showing straightening of left heart border with right ventricular type cardiomegaly and ECG showing right ventricular hypertrophy with strain pattern

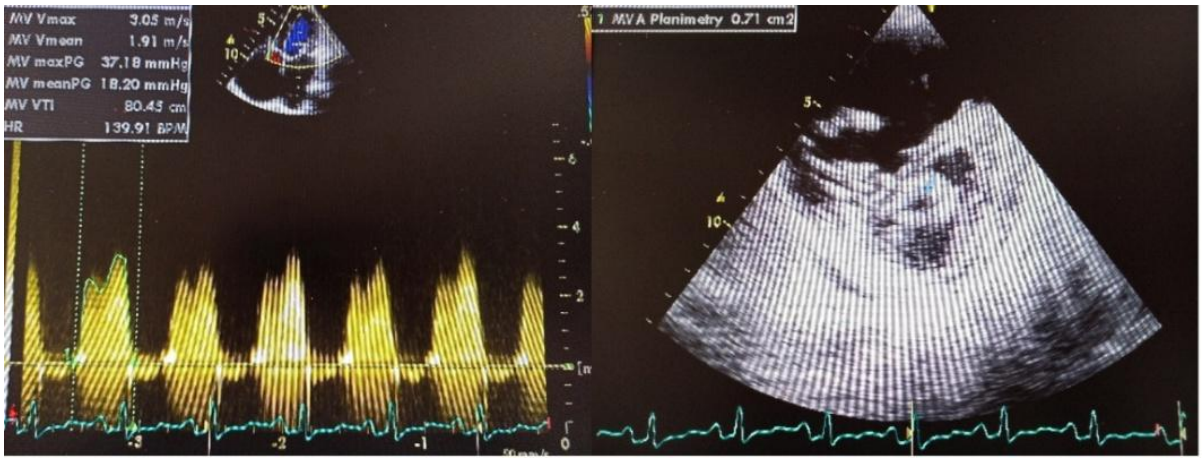

Fig. 2. Mitral valve trace and mitral valve area by planimetry pre BMV

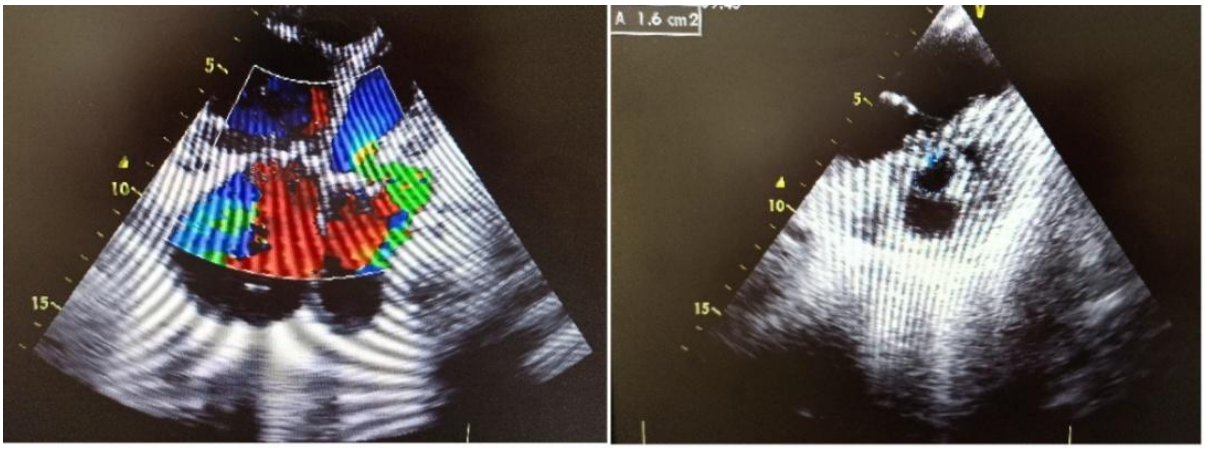

Fig. 3. Post BMV eccentric MR due to AML tear and mitral valve area by planimetry post BMV

In view of the AML tear and patient hemodynamically stable, he was semi emergently transferred for mitral valve repair to cardiothoracic and vascular surgery department but as the valve had severe fibrosis, mitral valve replacement was done with St Jude Medical 25 bileaflet valve. Post operatively patient recovered and was discharged on oral anticoagulant warfarin titrated to optimal PT/INR.

3. DISCUSSION

Rheumatic heart disease is the most common cause of mitral stenosis in India. Other less common causes include congenital mitral stenosis, carcinoid syndrome, mitral annular calcification, Fabry's disease, mucopolysaccharidoses, methysergide therapy, Whipple's disease and Amyloidosis. Rapid progression of mitral stenosis in developing countries is due to recurrent episodes of rheumatic fever, lack of secondary prophylaxis, unavailability of prophylactic penicillin and delayed detection of disease progression [7]. Initial attack of rheumatic fever usually manifests as mitral regurgitation due to temporary malfunction of mitral valve-papillary muscle-chordal apparatus. According to traditional view it takes 2-8 years for development of mitral stenosis from an attack of carditis. However, Bland and Jones showed that it usually takes longer than a decade for development of mitral stenosis with an asymptomatic latent period of fully developed mitral stenosis [8,9]. Our patient presented with recurrent mitral stenosis at the age of 12 years.

Juvenile mitral stenosis is characterized by severe mitral stenosis with severe pulmonary hypertension but without left atrial dilation or atrial fibrillation. It is also characterized by recurrence [10]. Our case was a diagnosed case of rheumatic heart disease and had recurrence at a very young age.

In a country like India, juvenile mitral valve disease essentially mitral stenosis is not uncommon and hence many patients may be diagnosed and treated for mitral stenosis in the first decade of life, like in the present case, the patient required balloon mitral valvotomy at the age of seven years. Since these patients develop recurrent rheumatic fever, they are prone to recurrent inflammation involving mitral valve apparatus exacerbating the process of restenosis. Regular penicillin prophylaxis can prevent recurrent attacks and decrease the morbidity [11,12].

Our patient was unfortunate to have developed restenosis of mitral valve at an early age of 12 years warranting a second procedure and that to a complicated mitral balloon valvotomy which ultimately ended up with a mitral valve replacement at a tender age of 12 years and to be on oral anticoagulants from this tender age.

4. CONCLUSION

Recurrent attacks of rheumatic fever can lead to early presentation of mitral stenosis. Our patient presented with restenosis of mitral valve post BMV at the age of 12. However, during BMV he developed AML tear and underwent mitral valve replacement instead of repair due to severe fibrosis.

CONSENT

All authors declare that 'written parental written consent for publication of this case report and accompanying images has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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