

Case Report

Mitral Valve Replacement After 10 Years of Closed Mitral Commissurotomy: A Case Report

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Abstract

Rheumatic mitral valvular heart disease is common in developing countries although its incidence is decreasing in western countries. Closed mitral commissurotomy (CMC) was the first effective intervention in valvular heart disease which provides excellent long-term hemodynamic and clinical improvement. In this study we are presenting a successful mitral valve replacement in reoperation of a case who had CMC operation 10 years ago. It shows when symptomatic deterioration occurs late after CMC, MVR restores clinical and hemodynamic improvement in many patients.

Introduction

Rheumatic mitral stenosis is a major public health problem in developing countries. It is usually encountered following streptococcal infections in the socio-economically poor communities. Mitral stenosis may require surgical intervention when the lesion is severe. The choice of operative technique is also very important like medical, surgical options. In patients with eligible mitral valve pathologies, closed mitral commissurotomy (CMC) may be a successful treatment option. But when symptoms are severe and mitral valve apparatus is grossly deformed MVR restores clinical and hemodynamic improvement in many patients.

Case Presentation

Our patient Salma khatun, 23 years old woman, normotensive, nondiabetic, nonalcoholic housewife, was admitted to Cardiac surgery department with palpitation, respiratory distress and increasing fatigue for last 4 months. Her symptoms were progressive and she was in New York Heart Association (NYHA) functional class III during admission. She suffered from rheumatic fever in her childhood. She also developed rheumatic mitral stenosis (MS) for which she underwent Close Mitral Commissurotomy 10 years ago in NICVD, Dhaka. Physical examinations showed she was ill looking, anxious, cooperative with average body built and nutrition. She had no anaemia, cyanosis, jaundice, clubbing, koilonychia, leuconychia, oedema and dehydration. Her pulse was 80 beats/min, irregular, low volume, Blood pressure 100/70 mm of Hg, respiratory rate 16/min, temperature normal. Cardiovascular system examination revealed a curvilinear incision mark in left 4th intercostal space. On palpation there was palpable mid diastolic thrill present in mitral area, left parasternal heave and palpable P2 in pulmonary area. On auscultation 1st heart sound loud in mitral area, 2nd heart sound loud in pulmonary area, there was a mid diastolic murmur best heard in mitral area. Investigation showed Hb 10 gm/dl, ESR- 25mm in 1st hour, WBC- 10,000/cmm, S.bilirubin- 0.6mg/dl, SGPT- 30U/L, S. Creatinine- 1.0mg/dl. ECG showed atrial fibrillation. Transthoracic echocardiography (TTE) showed a severe mitral stenosis with 1.1cm² mitral orifice area and 36 mm mitral valve annulus. Left atrium was dilated and left ventricular diameter was normal. Her pulmonary arterial pressure (PASP) was 60 mmHg. Both mitral valve leaflets were thickened & mildly calcified. AML showed diastolic doming. Posteromedial commissure was fused, anterolateral commissure was partially fused. Severe subvalvular changes were seen. There was mild Mitral regurgitation. Left ventricle EF was 68%. Aortic valve cusps were mildly thickened. But both Pulmonary & Tricuspid valves were normal in morphology & motion.

She was operated under general anaesthesia. Following median sternotomy, pericardiotomy was done. Adhesiolysis was sequentially done over aorta, RA, LV, LA, RV.

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The mitral valve was approached via left atriotomy. The entire valvular apparatus was carefully examined in order to assess the feasibility of reconstructive surgery. Both anterior and posterior mitral leaflet were thickened and calcified. Both cords were thickened and shortened. There was a fusion defect in both anterolateral and posteromedial commissures.

The native mitral valve was excised and valve replacement was done with 25 mm St. Jude's bileaflet mechanical valve. She required minimum inotropic support during weaning from cardiopulmonary bypass and early postoperative period. She was extubated after an intubation period of 10 hours and stayed in the intensive care for 3 days. Her post operative hospital stay was 12 days. There were no post operative complications. The functional capacity of our patient improved dramatically and she was in NYHA functional class I. 03 months after surgery her echocardiography revealed no functional dysfunction.

Discussion

Rheumatic mitral stenosis is a major public health problem in developing countries. Rheumatic heart disease is usually encountered following streptococcal infections in the socioeconomically poor communities. In mitral stenosis, the hemodynamic changes are seen due to the obstruction of left ventricular filling, and this leads to pulmonary hypertension, heart failure, pulmonary vascular disease and if untreated death ensues.¹

In developed countries CMC has been largely replaced in favour of percutaneous mitral balloon valvuloplasty (PMBV), despite the later method is very costly. But, CMC has been recommended in developing countries, like Bangladesh as it is simple and safe procedure with good outcome, economical, less invasive, short duration of operation and hospital stay, preserves native valve, avoidance from cardiopulmonary bypass and lack of any need for anticoagulation.^{2,3} CMC can be done in patients with stenotic mitral valves with pliable and uncalcified leaflets and no thrombus in left atrium. Reoperation is performed generally 5-20 years after first CMC operation. Mitral restenosis is the most frequent cause of reoperation.⁴

Our patient underwent CMC for rheumatic mitral stenosis. After operation her NYHA functional class improved to class I. There were no immediate post operative complications, like atrial fibrillation, mitral regurgitation, congestive heart failure, or thromboembolism. Patient was symptom free for more than 09 years. These findings are consistent with studies of Rutledge R, et al. Salerno et al. Ates et al.^{5,6,7} Rutledge R, et al. Showed 92% of patients improved one or more functional classes after closed mitral commissurotomy (CMC).

Actuarial survival was 95%, 82% and 70% at 5, 10 and 15 years respectively after CMC.⁵ Salerno et al., in their study with 139 patients showed the primary indication for CMC was mitral stenosis. Postoperative complications occurred in 3%, and operative mortality was 2.0%. Our patient was free from post CMC complications.⁶ Ates et al. studied 36 patients after CMC, with 14 years follow-up. After surgery, NYHA functional classification was improved in 94% patients.⁷ These findings are similar with our patients post CMC NYHA functional class improvement.

Our patient developed features of mitral restenosis after 09 years of symptom free life. She underwent MVR after 10 years of CMC. Duration between CMC and MVR and indications for MVR for our patient are similar with following studies. Rutledge R, et al. Showed 18% patients required MVR, a mean of 9.6 years after commissurotomy.⁵ Toumbouras et al. Showed 11% patients needed a repeat CMC. In all, 19.3% patients required MVR a mean of 17.0 years after commissurotomy.⁸ The indications for MVR were residual stenosis, restenosis and moderate-to-severe regurgitation.^{5,8}

Our patient was free from post operative complications after MVR. The functional capacity of our patient improved dramatically and she was in NYHA functional class I. Echocardiographic follow up after 3 months of MVR surgery revealed no functional dysfunction. Salerno et al.⁶ and Toumbouras et al.⁸, both showed 82% and 88% patients improved at least one functional class after MVR and the majority was free of congestive heart failure respectively.^{6,8}

So it can be concluded that closed mitral commissurotomy is a safe, simple, cost effective and also provides excellent long term hemodynamic and clinical improvement in appropriately selected patients in highly skilled hand. The mean time interval between CMC and late MVR reveals the efficacy of CMC to achieve satisfactory long term results. When symptomatic deterioration occurs late after CMC, MVR restores clinical and hemodynamic improvement in many patients.

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