



## A STUDY OF CLOSED MITRAL COMMISSUROTOMY IN THE CURRENT CONTEXT

<b>Dr. R. Meenakshisundaram</b>	MS, MCh, Formerly Senior Asst.Professor, Dept.of Cardiothoracic Surgery, Madras Medical College
<b>Dr. Josephrajan*</b>	MS, MCh, Formerly Senior Asst.Professor, Dept.of Cardiothoracic Surgery, Madras Medical College *Corresponding Author
<b>Dr. Shivanraj</b>	MS, MCh, Formerly Senior Asst.Professor, Dept.of Cardiothoracic Surgery, Madras Medical College

**ABSTRACT**

This study is a hospital based retrospective analysis in a teaching hospital.

**AIMS AND OBJECTIVES:** 1.To study the efficacy of closed mitral commissurotomy in rheumatic isolated mitral stenosis patients 2.To compare the long term outcome of balloon mitral valvotomy and closed mitral commissurotomy.

**MATERIALS AND METHODS:** Our study is a retrospective study of adult rheumatic mitral stenosis patients who underwent closed mitral commissurotomy between Feb 2007 and Feb 2012. 458 patients underwent closed mitral commissurotomy in the Department of Cardiothoracic Surgery, Government General Hospital, Chennai. We made five year followup study between Jan 2017 to Jan 2019 to assess the long term outcome of surgical correction in the study population during the study period. We made an assessment of postoperative improvement of symptomatology and exercise tolerance. We made a periodic assessment of mitral valve function and development of mitral regurgitation and mitral restenosis by echocardiography.

**CONCLUSIONS:** Closed mitral commissurotomy still remains a surgical palliation for selected cases of rheumatic mitral stenosis, with or without atrial fibrillation even in the era of BMV with comparable results.

**KEYWORDS :** c procedures/intervention/echocardiography/methods/heart valve diseases/surgery/mitral valve/surgery/mitral valve stenosis/

**INTRODUCTION**

With the advent of percutaneous interventions, closed mitral commissurotomy has become an almost obsolete procedure in many cardiac centres. But in a state sponsored, non profit hospital like ours, where due to non availability of balloons at all times and high inflow of patients, closed mitral commissurotomy still plays a significant role offering better outcomes for rheumatic heart disease with isolated mitral stenosis. Mitral commissurotomy is among the oldest cardiac operations reported in the world medical literature. In 1924, Cutler and associates reported the first closed mitral commissurotomy (CMC). In 1948 Harken and coworkers further developed the technique of closed commissurotomy. In 1959 Logan and Turner used a mechanical dilator for the surgical treatment of mitral stenosis. After the introduction of cardiopulmonary bypass, open mitral commissurotomy (OMC) under direct vision became feasible. Today technical advances have lowered the risks of cardiopulmonary bypass, which in turn has drastically reduced the frequency of CMC procedures in most major cardiac centers. In 1984, Inoue and associates first described percutaneous balloon mitral valvuloplasty for use in patients with symptomatic mitral stenosis. Since then, the use of percutaneous balloon mitral valvuloplasty has increased. In addition, echocardiographic scoring of mitral valve characteristics has been introduced. Mitral valve characteristics were evaluated according to an echocardiographic scoring system devised by Wilkins and associates. The score was determined by assigning a maximum of 4 points for severity with regard to each of 4 mitral valve variables: leaflet mobility, leaflet thickening, subvalvular thickening, and calcification. The score of mitral valve characteristics out of 16 possible points was then calculated and based on it the feasibility of CMC/BMV was decided, if the scores remain less than or equal to 4. Along with this there was advent of single- and double-balloon techniques in BMV.

**MATERIAL AND METHODS**

Between Feb 2007 to Dec 2011 458 cases underwent closed mitral commissurotomy in the Department of Cardiothoracic Surgery, Government General Hospital, Chennai. Of these 182 patients were

in NYHA class 2 and 276 patients were in NYHA class 3. 85 patients were in atrial fibrillation with controlled ventricular rhythm. Two had history of CVA at least 6 months before the surgery without any residual neurological deficit. Whenever TTE shows suspicion of LA or LAA clot TEE was performed to rule out LAA clot. Mitral valve morphology was also assessed based on Wilkins scoring and suitability of valve morphology for BMV/CMC. All suitable patients underwent CMC in the conventional manner through left anterolateral thoracotomy incision, with right index finger introduced through the left atrial appendage and Tubbs dilator introduced through stab incision in left ventricular apex between pursestrings, mitral valve orifice dilated with Tubbs dilator. Qualitative assessment of the mitral valve after split was made to look for residual stenosis and regurgitation. Then chest was closed with tying of the pursestrings in LAA and LV apex, approximating the pericardial edges and leaving a left intercostal drainage tube in the 5<sup>th</sup> space. All patients were extubated on the table. The ICD was removed 24-48 hrs after surgery. Patient was discharged on 8<sup>th</sup> postoperative day with echocardiography done. On follow up, the incidence of restenosis, post procedure mitral regurgitation, development of neurologic complications were documented by followup clinical examination and echo cardiography every 6 months for the first year and then annual echo cardiography. Any preoperative risk factors for complications in the form of age, pregnancy, NYHA class, echocardiographic score of mitral valve were analysed. Waheed Attmann et al from the Department of Cardiac surgery Alexandria University Egypt had documented a modified technique of CMC. It advocates smaller anterolateral thoracotomy incision, preoperative insertion and positioning of TEE probe, TEE probe guidance of Tubbs dilator through a left ventricular stab incision without opening the left atrial appendage. We tried the technique in 3 patients with successful commissurotomy in all three patients. But the nonavailability of TEE probe at all times limited our usage of this technique to all patients. The results of conventional CMC were also compared with outcomes of patients undergoing percutaneous balloon valvotomy elsewhere. The avoiding of LAA opening precludes many complications associated with conventional CMC with smaller incisions.

**TABLE 1 FOLLOWUP DATA**

	CMC our series	BMV FARHAT et al	BMV FAUZY et al
Procedure mortality	1.8%	nil	nil
Postprocedure morbidity	15(7%)	-	10(1.5%)
Procedure costs	100-150 \$	-	2000\$
Need for re intervention	2.75%	-	-
Incidence of Restenosis	14(6%)	6.6%	22%(15 yrs)
Incidence of Regurgitation	7(3%)		9(1.6%)
Post procedure NYHA class1/2	90%	93%	-
Postprocedure echo results	2.1±0.4 cm2	1.95±0.4 cm2	2.2±0.4 cm2

**RESULT AND ANALYSIS**

Except five patients whom had severe pulmonary hypertension all patients were extubated on the operating room. Postoperative clinical assessment showed 407 patients were in NYHA class 1 or symptom free. Immediate postoperative period, 11 patients had mild to moderate MR. There were 4 deaths. Two patients developed left atrial appendage laceration, bleeding and could not be revived before attempting to go on emergency sternotomy and cardiopulmonary bypass. Two other patients developed severe pulmonary edema and mitral regurgitation and could not be extubated. They were taken up for mitral valve replacement but could not be saved. 11 patients developed postoperative neurological complication during the followup. 12 patients were found to develop restenosis. One was offered redo CMC. Other four underwent either BMV or mitral valve replacement. 2 of our patients underwent CMC for the third time, 19 patients underwent CMC for the second time. 17 cases were pregnant and underwent CMC in the second trimester. Our results were comparable to other high volume centers. (table 2) Closed mitral commissurotomy offers excellent short term and intermediate term surgical palliation in selected patients with low operative mortality and complications.

**TABLE 2 COMPARISON OF CMC/BMV**

	CMC our series	BMV FARHAT et al	BMV FAUZY et al
Procedure mortality	1.8%	nil	nil
Postprocedure morbidity	15(7%)	-	10(1.5%)
Procedure costs	100-150 \$	-	2000\$
Need for re intervention	2.75%	-	-
Incidence of Restenosis	14(6%)	6.6%	22%(15 yrs)
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**CONCLUSION**

- When the valve morphology is suitable, where there is inadequate supply of balloons, this procedure is still practiced with low operative mortality and comparable long term results.
- It also offers good surgical palliation for pregnant women and patients with involvement of aortic and mitral valves.
- It can also be done as a repeat procedure with safety in select subgroup of patients.
- Improving the technique of CMC with incorporation of imaging modalities like TEE and avoiding the LAA finger insertion and smaller incisions may offer CMC as better palliation and adaptable in more centres.

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