

# A Case Of Ischemic Stroke In A Patient After Percutaneous Transvenous Mitral Commissurotomy (PTMC)

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**Abstract**—Now a day Percutaneous transvenous mitral commissurotomy (PTMC) has become the procedure of choice for patients with symptomatic severe mitral stenosis (MS) who have suitable mitral valve morphology on echocardiography. Surgical commissurotomy has been replaced by PTMC as a treatment of choice in many selective cases. Out of a few adverse effects systemic embolization has considered one of the dreaded complications of PTMC. Its involvement has found around 1% of cerebral circulation and 0.5-5% cases systemic embolization has been reported so far due to PTMC. Here we report a case of ischemic stroke following PTMC in a 45 years old lady with severe rheumatic mitral stenosis.

**Keywords**—Mitral stenosis(MS), Percutaneous transvenous mitral commissurotomy(PTMC).

## I. INTRODUCTION

In developing countries like Bangladesh, rheumatic heart disease has always been considered a frequent problem; though its incidence has declined remarkably in the western world. In Bangladesh the prevalence of rheumatic fever is 0.6/1000 population and that of rheumatic heart disease is 0.3/1000 [1]. Mitral valve has found as the most frequently affected valve in the rheumatic heart disease. Around 25% cases it is affected alone and its association with other valves has been found around 40 % of patients [2]. Mitral stenosis frequently encounters in females whether as mitral regurgitation (MR) is more common among males. Rheumatic fever has always been

declared as the principle etiology for MS whether alone or in combination with other valvular heart diseases [3]. Congenital mitral stenosis is the extremely unaccustomed variety of MS which has a high mortality rate in the earlier periods of life [4].

PTMC was first discovered by Inoue K and colleagues in 1982 as treatment purpose for the symptomatic patients with moderate to severe MS who had suitable mitral valve morphology on echocardiography. A rising preference in this procedure has resulted in its diverse implementations to certain clinical conditions where surgical commissurotomy generally could not be performed such as restenosis following surgical commissurotomy, subvalvular fibrosis with MS, calcific MS in elderly population or in amalgamation with other valvular heart diseases [3]-[6]. Regarding hemodynamic stability and long term survival benefits many randomized trials have already been considered PTMC as equal or superior to surgical commissurotomy [7],[8].

Various complications can develop during or after PTMC but systemic embolization (0.5-5%) has secured the most endangered among all with the involvement in the cerebral circulation around 1% cases [9],[10]. Mobilization of preceding thrombus in the left atrial appendage has found as the main etiological factor for the development of systemic embolization following PTMC [11]. Here, we report a case of ischemic stroke in a 45 years old lady following PTMC.

## II. CASE PRESENTATION

A 45-year old diabetic lady presented to Bangladesh Medical College Hospital, Dhanmondi, Dhaka with New York Heart Association (NYHA) class II dyspnea for the past 7 years with recent deterioration of her symptoms to NYHA class III. She also frequently suffered from paroxysmal nocturnal dyspnea and several episodes of hemoptysis. She had a past history of rheumatic fever for which she was treated accordingly. She had a normal vaginal delivery 15 years ago with no peri or post-partum consequences. On physical examination she had irregularly irregular pulse rate of 86/min, blood pressure of 125/80 mm of Hg and respiratory rate of 18 breaths/min. On auscultation, 1<sup>st</sup> heart sound was loud with an opening snap, a low pitched rumbling mid diastolic murmur with pre systolic accentuation was also found. The pulmonary component of the 2<sup>nd</sup> heart sound was loud with normal splitting. All other systemic examinations revealed no abnormalities.

On routine investigations, Electrocardiogram showed atrial fibrillation, right axis deviation with the features suggestive of left atrial (LA) and right ventricular enlargement. Chest X – ray findings were double right heart border (left atrial enlargement), prominent pulmonary artery (pulmonary hypertension) and Kerly B lines. The diagnosis of severe mitral stenosis was confirmed by transthoracic echocardiogram with a mitral vulvular area of 0.83cm<sup>2</sup> by the pressure half time (PHT) and 0.76cm<sup>2</sup> by planimetry. There was no free clot in the left atrium and left atrial appendages. The score of mitral valve was found 6 according to Wilkins echocardiographic findings. The valve seemed to be extremely fibrotic but neither calcification nor any other vulvular abnormalities were detected around that area.

The Inoue techniques were applied for performing PTMC, the description of the whole procedure was narrated elsewhere. After the fruitful LA entry and septal puncture, the patient was given 2500 units of unfractionated heparin. A single Inoue balloon dilatation successfully reduced the LA pressure from 34 mm Hg to 12 mm Hg. Successful opening of both the mitral commissures were observed by immediate post dilated echocardiography. Without acquiring any significant mitral regurgitation (MR), the mitral vulvular area was expanded to 1.50cm<sup>2</sup> with mild pulmonary hypertension (37mmHg) [Figure 1].

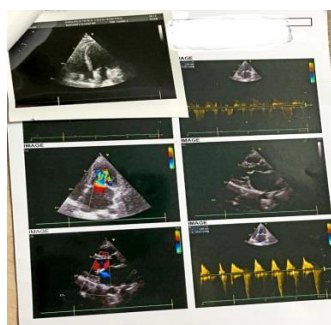


Figure 1: Post PTMC status on echocardiography

4 weeks following the procedure the patient suddenly developed slurring of speech with weakness of right upper half of the body. Our suspicion went towards systemic embolization from the mitral valve fragments as there was no clot in the LA and left atrial appendages. The highest possible cause to cerebral embolism could be due to mitral valve disruption following balloon dilation.

As the right hemiparesis and the altered sensorium status was persisting an urgent CT scan of brain was arranged which revealed acute infarcts at the left parieto-temporal lobe and basal ganglia in the territory of left middle cerebral artery [Figure 2].

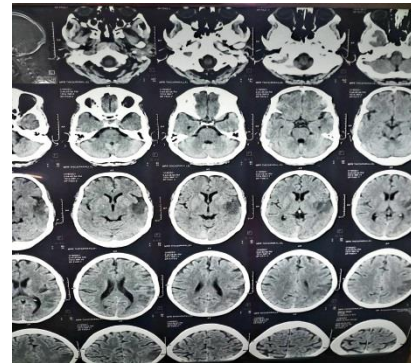


Figure 2: CT scan of brain

The patient was managed by the help of the multi-disciplinary team including Neurologist, Neurosurgeon, Physiotherapist, Cardiologist and Cardiothoracic surgeon. The patient gradually improved with grade II/V power in the right upper and lower limbs, became fully oriented and conscious. She was discharged 4 weeks following this presentation and scheduled for subsequent follow-ups.

## III. DISCUSSION

In developing countries like Bangladesh the main offender for MS is rheumatic fever. Due to the poor socioeconomic status and overpopulation it remains quiescence for many years and usually diagnoses at the advanced stage among younger females. After the first mitral valvuloplasty done by Inoue in 1982 PTMC has become the treatment of choice for symptomatic MS.

Many factors are responsible for its success and fruitful results. It mainly relies upon morphology of mitral vulvular area, severity of MS, presence of MR before PTMC, calcification around valve and vulvular apparatus, previous history of commissurotomy, age, NYHA functional classification and pulmonary hypertension.

Mitral regurgitation has considered as the most frequent complication (around 2-19%) of PTMC [12]. Controversial opinions are present for the development of MR during PTMC [13]. In our patient no significant MR was found. Other vulvular complications were also not detected.

Systemic embolization following PTMC can result in permanent disability or even death. Its incidence

has found 0.5-5% during PTMC with the involvement of cerebral circulation around 1% [9],[10]. Patients suffering from TIA or stroke, atrial fibrillation should have undergone Trans esophageal echocardiography beforehand the procedure along with proper heparinization afterwards.

Systemic embolization has always regarded as a case of emergency with urgent cerebral imaging need to be done to exclude intracranial hemorrhage and prompt revascularization should be undertaken.

There are various forms of revascularization like systemic thrombolysis with tissue plasminogen activator, intra-arterial thrombolysis, surgical thrombectomy, intracranial angioplasty and stent retriever thrombectomy [14].

All the submitted case reports regarding systemic embolization after PTMC had significant mitral valve calcification [15],[16] which was not found on echocardiography in our patient. Following balloon dilatation of mitral valve tissue embolization could be a factor for cerebral embolization which is the prime suspicion in our case. Mechanical revascularization plays the pivotal role for its management rather than systemic or intra-arterial thrombolysis.

#### IV. CONCLUSION

PTMC has secured as the safest and successful intervention for certain group of patients suffering from severe MS. However, systemic embolization has become one of its dreadful complications which needs to be monitored carefully. Necessary steps should be taken for its prevention and immediate management to prevent permanent disability and mortality among these patients.

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