

## ORIGINAL ARTICLE

**Incidence of Acute Mitral Regurgitation in Patients with Severe Mitral Stenosis after Post Percutaneous Transvenous Mitral Commissurotomy**FOUZIA GOPHER<sup>1</sup>, MUHAMMAD IRFAN<sup>2</sup>, ANWAAR UL HASSAN<sup>3</sup>, MARRYAM RAUF<sup>4</sup>, KHURSHEED AHMAD<sup>5</sup><sup>1</sup>Assistant Professor Cardiology, Cardiac Centre, Bahawalpur<sup>2</sup>Assistant Professor Cardiology, Cardiac Complex/PIC, Bahawalpur<sup>3</sup>Assistant Professor Cardiology, Cardiac Centre, Bahawalpur<sup>4</sup>Senior Registrar Cardiology, University College of Medicine and Dentistry, Lahore<sup>5</sup>Senior Registrar Cardiology, Cardiac Center, BahawalpurCorresponding author: Muhammad Irfan, Email: [irfanmumtaz82@gmail.com](mailto:irfanmumtaz82@gmail.com)**ABSTRACT****Aim:** To determine the incidence of Acute Mitral Regurgitation in severe mitral stenosis patients done with Post Percutaneous Transvenous Mitral Commissurotomy (PTMC).**Methodology:** This cross-sectional study was held in the Bahawalpur Heart Center, Bahawalpur for the duration of six months from March 2022 to September 2022. The study included 80 patients, regardless of gender, between the ages of 19-80 years and who had not undergone PTMC. Those with mitral regurgitation and mitral stenosis, left atrial clots, and patients with end-stage renal disease were not included in the study. The predefined Proforma was used as a research tool to document the medical records of PTMC patients. The patient's name, age, echo results, sex, course of treatment, complications and post-procedure information are among the variables documented on the proforma.**Results:** The patients mean age recorded in this study was  $43.18 \pm 10.33$ . The maximum of the PTMC patients, were females 65(80%). The majority of PTMC patients were found to have "Trace" MR, which is a very slight leak in a heart valve. Before the procedure, there were 30 (37.5%) patients with trace MR, followed by 27 (33.8%) patients with mild MR. Before the procedure, 8 (10%) patients had no MR-related difficulties, 5 (6.2%) had moderate MR, and 4 (5%) had mild-moderate MR. After the procedure, 63 (78.8%) of the patients experienced "no complications," 12 (15%) of the PTMC patients experienced "severe mitral regurgitation," 4 (5%) experienced a local hematoma, and cardiac tamponade was seen in one patient. Post-procedure, one patient died. Post-stratification research revealed that 61.3% of patients without a prior history of commissurotomy and the majority of female patients had no complications. While 22.4% of those who never had a prior commissurotomy experienced severe MR overall**Conclusion:** Our research showed that only a small proportion of PTMC patients had severe mitral regurgitation. Overall, the treatment was successful and safe.**Keywords:** Cardiac Tamponade, Local Site Complications, Post Percutaneous Transvenous Mitral Commissurotomy, PTMC, Mitral Regurgitation, MR**INTRODUCTION**

The valvular damage that results in increased mortality and morbidity in many industrialized and developing nations is caused by rheumatic heart disease<sup>1-2</sup>. Pakistan is regarded as a third-world nation having a high RHD frequency<sup>3</sup>. Mitral stenosis is the most common cause of the RHD. Only between 50 and 70 percent of patients presents with a history of RHD, nevertheless. It is one of the main health issues facing the developing countries<sup>4-5</sup>. In individuals with hemodynamic mitral stenosis, percutaneous transvenous mitral commissurotomy (PTMC) has been considered a nonsurgical option for commissurotomy<sup>6</sup>. In comparison to surgical issues, the PTMC technique is substantially less intrusive, more expensive, and has a far lower risk of pericardial tamponade. However, the technique is linked to a wide range of problems, and the literature has reported conflicting results from numerous researches about PTMC's short- and long-term effects<sup>7</sup>. With practice, the PTMC procedure's success rate has noticeably grown while the post-complications ratio has decreased. The high tendency of patients to develop mild to moderate mitral regurgitation, which is tolerated in 25–83% of patients, remains a significant complication of the PTMC<sup>8</sup>. However, according to study, between 1.4 -7.5% of patients exhibit acute mitral regurgitation symptoms as a result of the PTMC procedure<sup>9-10</sup>. The current investigation was carried out since there aren't many research papers about the frequency of acute mitral regurgitation in patients who have undergone Percutaneous Transvenous Mitral Commissurotomy surgery and have had severe mitral stenosis. This research study's main goal was to examine how frequently acute mitral regurgitation occurred in individuals who had had post-percutaneous transvenous mitral commissurotomy procedures due to severe mitral stenosis.

**METHODS**

This cross-sectional study was held in the Bahawalpur Heart Center, Bahawalpur for the duration of six months from March

2022 to September 2022, after ethical approval from the hospital. Prior to the data collection, informed consent was gained from each patient. The study included 80 patients, regardless of gender, between the ages of 19-80 years and who had not undergone PTMC. The patients with mitral stenosis and mitral regurgitation, left atrial clots, and patients with end-stage renal disease were not included in the study. The predefined Proforma was used as a research tool to document the medical records of PTMC patients. The patient's name, age, echo results, sex, course of treatment, complications and post-procedure information are among the variables documented on the proforma. Transthoracic echocardiography (TTE) was done to determine mitral regurgitation pre- and post-procedural. IBM SPSS (statistical package for social sciences software) 23 version was used to analyze the data. Age, height, weight, body mass index, and other continuous data were all presented as means and SDs. All categorical data, including gender, age groups, past commissurotomies, etc., were presented as frequency and percentages. The patients were stratified according to gender, age groups, past commissurotomies, and NYHA classification to determine the post-procedural complications relationship.

**RESULTS**

The patients mean age recorded in this study was  $43.18 \pm 10.33$ . The maximum of the PTMC patients, were females 65(80%). The majority of PTMC patients were found to have "Trace" MR, which is a very slight leak in a heart valve. Before the procedure, there were 30 (37.5%) patients with trace MR, followed by 27 (33.8%) patients with mild MR. Before the procedure, 8 (10%) patients had no MR-related difficulties, 5 (6.2%) had moderate MR, and 4 (5%) had mild-moderate MR (Table 1 and 2).

After the procedure, 63 (78.8%) of the patients experienced "no complications," 12 (15%) of the PTMC patients experienced "severe mitral regurgitation," 4 (5%) experienced a local

hematoma, and cardiac tamponade was seen in one patient. Post-procedure, one patient died.

Table-1: shows the patients clinical features

Variable	Frequency	%
Gender		
Male	15	18.7
Female	65	81.3
Age Groups		
≤ 30	17	21.3
31- 40	26	32.5
41 - 50	20	25
51 - 60	10	12.5
61 - 70	5	6.2
71 - 80	2	2.5
Previous Commissurotomy		
Yes	7	8.8
No	73	91.2
New York health association (NYHA) Class		
II	5	6.3
III	69	86.2
IV	6	7.5
Mitral regurgitation (MR)		
Mild	27	33.8
Mild-Moderate	4	5
Moderate	5	6.2
Moderate-Severe	2	2.5
Severe	1	1.3
Trace	30	37.5
No Regurgitation	3	3.8
No Mitral valve related issue	8	10

Table-2: shows the patients Descriptive statistics

Parameters	Mean	Standard Deviation
Age	43.18	10.33
Weight	69.74	12.64
Height	160.91	6.42
Body Mass Index	29.72	7.42
Pre-procedure Parameters		
Mitral valve area (Preprocedure)	1.1	0.12
Reference Balloon size	25.65	0.65
Peak pressure gradient (PG)	23.91	5.68
Mean pressure gradient (MG)	14.24	3.11
Peri- & Post-procedure Parameters		
Balloon size used in procedure	26.85	1.2
Balloon max inflated up to	27.20	0.9
Mean pressure gradient (post procedure)	5.94	1.65
Mitral valve area (post procedure)	1.75	0.33
Peak pressure gradient (post procedure)	13.79	3.325

Table-3: shows the patients complications ratio and comparison with various variables

Variables	Cardiac Tamponade	Local Site Hematoma	Severe Mitral Regurgitation	No Complication	Death
Gender					
Male	1	3	2	9	0
Female	0	1	10	54	1
Previous Commissurotomy					
Yes	0	2	2	11	1
No	3	2	11	49	0
Age Groups					
≤ 30	1	0	8	8	0
31 - 40	0	4	1	21	0
41 - 50	0	1	1	18	0
51 - 60	0	1	3	7	1
61- 70	0	0	2	3	0
71 - 80	0	0	1	1	0
NYHA Class					
Class I	0	0	0	0	0
Class II	1	0	0	4	0
Class III	0	3	15	51	0
Class IV	0	0	1	5	1

Post-stratification research revealed that 61.3% of patients without a prior history of commissurotomy and the majority of female patients had no complications. While 22.4% of those who never had a prior commissurotomy experienced severe MR overall (Table 3). The cross-tabulation table shows the relation between extreme age ranges and Severe MR. The balloon size and post-procedure complication rates did not significantly correlate.

## DISCUSSION

A number of important facts about acute mitral regurgitation (MR) in PTMC patients are revealed by the thorough quantitative study<sup>11</sup>. The maximum of the patients were females (81.3%) and maximum patients were in 31 to 40 years of age range (32.5%), according to the study's findings. The post-procedure statistics showed that the technique used an average balloon size of 26.85 cm3, which was larger than the typical size to be used (25.65 cm3). The majority of patients did not experience any complications following the treatment, with mitral regurgitation being the most frequent problem. Local site hematoma, cardiac tamponade, and mortality were among additional problems seen in the study. The findings also show that after the surgery, significantly more men than women experienced "severe MR." Elderly people were more likely to experience severe mitral regurgitation after the surgery, suggesting a connection between extreme age groups and severe MR. The results of the present investigation are consistent with the previous academic literature. According to a study by Kothari et al, PTMC is a safe operation that may be carried out without an increased risk for complications; however, patients who were diagnosed with severe mitral stenosis reported restenosis more frequently than patients in the control group<sup>11-12</sup>. According to Kubota et al., PTMC has a good long-term outcome with a 71% 20-year survival rate<sup>13</sup>. It was suggested that people with poor immediate outcomes following PTMC should be closely monitored because they had a lower survival rate than people with positive early outcomes<sup>14</sup>. In another study by Bhardwaj et al., the quality of life of MS patients was assessed before and after PTMC<sup>15</sup>. It was found that PTMC was not only a safe and effective surgery but also greatly improved patients' QOL, underscoring the significance of providing this procedure at an earlier stage of the disease. According to a local study done in 2019 at the Combined Military Hospital in Pakistan, the authors did not notice any post-PTMC problems such as localized hematoma, mitral regurgitation, or circulatory compromise<sup>16-17</sup>. The patients' success rate with PTMC (mean age, 40.3 ±2.8) was very high. The PTMC technique has a high success rate in patients with severe mitral stenosis, according to the current analysis and previously published literature<sup>18-19</sup>. According to multiple studies, maintaining mean valvular area and mean gradient pressure in the mitral valve may increase the incidence of postoperative mitral regurgitation<sup>20-21</sup>.

In this study, there were few limitations. First, only the short-term procedure problems were noticed because the patients did not maintain a long-term follow-up. Second, because it was a single-centered study with an undiversified sample population, we are unable to extrapolate our findings to a larger population. Planning should be done for additional extensive research projects with a diverse fraction of the population.

## CONCLUSION

Only a small number of patients who received PTMC had significant mitral regurgitation, according to our findings. Overall, the treatment was successful and safe. In order to investigate the genetic, environmental, and hospital-associated factors connected to post-procedural problems in patients with severe mitral regurgitation who received PTMC, a multiethnic, multicenter, and multicity study should be carried out in Pakistan.

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