



## THE CLINICAL PROFILE AND TREATMENT OF PROSTHETIC VALVE THROMBOSIS

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### Abstract

**Background:** Prosthetic valve thrombosis is one of the most well-known life-threatening complications after valve replacement surgery. A poor antithrombotic status causes this thrombotic condition.

**Objective:** The purpose of this study to examine how prosthetic valve thrombosis was treated at our institute. Furthermore clinical characteristics of the patients were also assessed.

**Methodology:** This observational study was conducted at the cardiology department of Lady reading hospital Peshawar. The study covered 20 patients who consulted the cardiology unit from October 2022 to October 2023. The patients who were recently diagnosed with PV thrombosis were selected. Each patient's clinical characteristics and demographic profile were noted. In-hospital results were also examined. All the data was analyzed by using SPSS 23.

**Results:** This observational study was conducted on 20 patients. The majority were female patients (55%) in this study. Fluoroscopy was used to confirm the diagnosis further. The patients with PV thrombosis ranged in age from 12 to 70, with an average age of 36 years. After one week of symptoms, 90% of patients were allowed to admission in the hospital. Ninety percent of the patients reported difficulty breathing and other symptoms. Thrombolysis was the most usually utilized treatment, administered to 92% of the patients.

**Conclusion:** A significant mortality rate is linked to PV thrombosis in a clinical emergency. Poor anticoagulation therapy compliance is a consequence of low socioeconomic levels. Daily updates to the PV thrombosis treatment recommendations need proper disease management to improve medication compliance. The use of thrombolysis in the treatment of prosthetic valve thrombosis is thought to be beneficial.

**Keywords:** Prosthetic valve thrombosis, clinical profile, treatment.

### Introduction

Across the world, valvular heart disorders impact more than 100 million people. This condition is linked to more excellent rates of death and morbidity. The frequency of degenerative valve disease has significantly grown in recent years <sup>1, 2</sup>. The predicted prevalence of mitral valvular heart disorders is 2.5%. In the following years, the majority of these illnesses are expected to increase

significantly. Patients with valvular diseases often have surgical valve replacement as their first line of therapy, but over the last ten years, transcatheter technologies have become more popular as an alternative to operations<sup>3</sup>. The range of PV thrombosis incidence annually is between 0.1<sup>4</sup>.

Transcatheter valve treatments are the recognized therapy choices for people with aortic stenosis. This pathogenic situation known as prosthetic valve (PV) thrombosis is characterized by the thrombus development and consequent prosthetic valve dysfunctions<sup>5</sup>. It ranks among the most frequently seen side effects following heart valve surgery. In developing nations, mortality rates are often higher. Patients with mechanical heart valves are more likely to have thromboembolic events. They are frequently observed in the position of the mitral valve. The two most commonly reported side effects after valve replacement are PV thrombosis and hemorrhage. Various studies point to several therapeutic options for PV thrombosis. However, there is ongoing debate regarding the appropriate approach to take<sup>6</sup>.

The size, location, and other factors, including the patient's clinical state, significantly influence the therapy choice. The most difficult patients for cardiac surgeons to treat are those who have both rheumatic illness and post-valve thrombosis. The condition is primarily seen in rural and isolated locations because of a lack of infrastructure for routine PT/INR monitoring<sup>7, 8</sup>. Thrombolytic therapy is the most frequently utilized therapy for treating such patients. The vast majority of people live in poverty in developing nations like Pakistan. Thus, thrombolytic therapy is widely used since it is much more affordable than other forms of treatment.

This study analyzed the short-term results and clinical profile management tactics for patients with PV thrombosis in the hospital<sup>9, 10</sup>.

### **Material and method**

This observational study was conducted at the cardiology department of Lady reading hospital Peshawar. The study covered 20 patients who consulted the cardiology unit from October 2022 to October 2023. The study has received approval from the hospital's ethics and review board committee. All patients who voluntarily agreed to participate in the study gave informed consent.

Based on the inclusion criteria, the patients who had been diagnosed with PV thrombosis were selected for further investigation. Each patient's clinical profile, echocardiography results, and demographic details were noted. Effects and complications that occurred in the hospital were also examined. Patients' complaints and problems were also reported. The patients who participated were monitored for six months. The statistical analysis was performed using SPSS version 23. For the purpose of assessing the data, several tests have been conducted. The threshold of significance was 0.05. Although percentage and number were employed to indicate categorical variables, Both the mean and standard deviation were presented as continuous variables.

The need for the cross valve to be reduced by 50% while hemodynamics significantly improved was critical to the effectiveness of the thrombolysis. Failure of the TT was seen as a surgical failure.

### **Results**

In the current study 20 patients who had confirmed PV thrombosis and were admitted to the cardiology unit from October 2022 to October 2023 were enrolled. The doctor gave each patient a thorough clinical examination before using echocardiography to determine each patient's diagnosis. Fluoroscopy was used to confirm the diagnosis further. The patients with PV thrombosis varied in age from 12 to 70, with a mean age of 36 years.

The study included a total of 20 patients with 55% female and 45% male. 90% of the patients selected for the study were admitted to the hospital within a week of presenting symptoms. The delay between the patients' operation and the onset of their symptoms was considerable. The earliest instance recorded among all of this data was at 2 months, while the presentation's average age was 60 months. 90% of patients reported having difficulty breathing and other associated symptoms. Just 3 patients reported having chest pain.

Thrombolysis was the most frequently utilized kind of therapy administered to 92% of the patients. Whereas four patients had direct surgical intervention. 84% of patients had some prosthetic mitral

valve thrombosis. 15% of patients were found to have an isolated aortic valve thrombosis, it was found. The prosthetic mitral valve was constructed with an average gradient between 15 to 30 mmHg, with an average of 21.53 mmHg.

**Table 1: Patients' demographics**

Characteristics	No of Patients (n=20)
Gender	
Male	9 (45%)
Female	11 (55%)
Age	
Max	70 years
Min	12 years
Average age	35.5 ±7.4

**Table 2: The patient's clinical characteristics**

Features	No. of patients (%)
Indications	
Shortness of breath	18 (90%)
Chest pain	3 (15%)
NYHA level	
CII	2 (10%)
CIII	13 (65%)
CIV	5 (25%)
ECG (rhythm)	
Sinus	9 (45%)
Atrial fibrillation	8 (40%)
Pacing	1 (5%)
Hypertension	2 (10%)
Physical examination	
DMC	16 (80%)
DMC along with crepitation	4 (20%)
Value of INR	
Sub-therapeutic	13 (65%)
Maximum	6 (30%)
Supra level	1 (5%)
Complications	
Serum sickness	5 (25%)
Mortality	3 (15%)
Bleeding	2 (10%)

## Discussion

Twenty patients with PV thrombosis were hospitalized for this investigation. All patients provided written permission and were fully informed about the study. Most of the patients were female, and their average age was 36. Data from their retrospective investigation revealed comparable female dominance to studies by Hiranchan et al. moreover, 36 years were also chosen as the analyses' average age <sup>11</sup>.

The average age in various international studies was greater than 40, in other instances, 50 was the average age used in the retrospective study. The data also revealed a similar female majority. Yet, studies conducted in India show more male than female participants in their data, with an average age of 40 years <sup>12</sup>.

Similar studies were identified in our analysis, and the mitral valve was most frequently correlated

with thrombosis, while the aortic valve was only involved in 15% of cases, According to previous research, this study indicated that the incidence of mitral PV thrombosis was 2–3 times greater than the frequency of aortic prosthesis. These results were consistent with those of Gupta et al.<sup>13</sup>. that indicated that 84% of patients with mitral position had PVT episodes. 92% of patients had practical completion of thrombolysis, which was a great result<sup>14</sup>. These results were consistent with those of earlier investigations, which discovered that streptokinase was the enzyme employed as a thrombolytic agent. Nevertheless, urokinase was the protein used for thrombolysis, according to experiments conducted by Feng et al. Moreover, 70% of patients had perfect success rates.

In this study, 20 patients had undergone TT, representing a mortality ratio of 15% throughout the whole TT group<sup>15-16</sup>. Its mortality rate was known to be much lower than the many other studies done in the same area. Yet, according to further research, the TT patients' mortality rate was the same, at 15–17%. One of the characteristics mentioned by many patients in our sample was poor medication compliance; this was anticipated by a lower INR value simply during the presentation period since it was discovered that most patients had sub-therapeutic INR levels. These instances are more prevalent in undeveloped countries with poor social and economic situations<sup>17</sup>.

According to studies on INR levels, PV thrombosis was caused by several factors, including poor medication compliance and inadequate anticoagulation. The length of the procedure and the severity of the PV thrombosis varied greatly, and the community's socioeconomic standing mainly influenced this difference. Our investigation showed that the time between surgery and PV thrombosis from a low of 2 to 145 months, with a typical 60-month duration.

The development of thrombosis was shown to be influenced by atrial fibrillation as well as insufficient anticoagulation (PV). 46% of the people involved in this study reported having an AF, which was in line with other studies. Nonetheless, PV thrombosis was present frequently in certain patients<sup>18</sup>.

According to Karthikeyan's investigations, there were no significant differences in the outcomes, such as improvements in the pressure gradient of the transvalvular or other grave problems associated with the interval between surgery and thrombolysis. Yet, medical professionals recommended against thrombolysis in favor of an urgent check-up by the doctors and an appropriate surgical surgery<sup>19</sup>.

According to studies conducted by Sabahattin et al., In surgical cases, the mortality ratio was as high as 70%, and in TT cases, it was as high as 16%. It was accruing to the shortage of surgical equipment and the high prices<sup>20</sup>. Most people start to hesitate about having the operation again<sup>21, 22</sup>. One of the drawbacks of this study is that it only used data from one center; if data from other centers had been combined, it would be simpler to understand the findings

## Conclusion

According to this study, prosthetic valve thrombosis is an emergency medical situation and is associated with a significant mortality rate. Poor anticoagulation therapy compliance is a consequence of low socioeconomic levels. Daily updates to the PV thrombosis treatment recommendations need adequate disease monitoring to improve medication compliance.

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