

## A Retrospective Study of Outcome of Prosthetic Heart Valve Occlusion Cases at JIPMER

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**Abstract:** Valvular heart disease requires prosthetic valve replacement in order to improve survival and quality of life. With the advent of transcatheter valve replacement, the scope for valve replacement even in inoperable patients has increased. This Retrospective study was conducted with an objective to study the outcome of prosthetic valve occlusion cases managed in our institution, and to assess the impact of clinical presentation, thrombus size, type of prosthetic valve used and time interval since valve implantation followed by echo findings on the outcome. In the end, it was evident that thrombolysis and surgical management of prosthetic valve occlusion patients has almost equally favorable outcome in majority of the patients. Both thrombolysis and surgery are good life saving procedures.

**Keywords:** Pannus, Stuck valve prosthesis, Thrombolysis, Valvular heart disease

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### I. Introduction

Valvular heart disease requires prosthetic valve replacement in order to improve survival and quality of life. And now with advent of Trans catheter valve replacement the scope for valve replacement even in inoperable patients has increased. Though valve replacement is one of the lifesaving procedures for patients with valvular heart diseases it has the risk of life threatening complications either related to the prosthetic valve or related to anticoagulation<sup>1</sup>

Prosthetic valve obstruction occurs due to thrombus, pannus formation or both on the mechanical valve resulting in restricted valve opening or stuck valve in open position<sup>2</sup>. Incidence of prosthetic valve obstruction is between 0.1% to 6% in patient years for left-sided prosthetic valves and incidence for prosthetic tricuspid valves is up to 20%. PVT depends on valve type, anticoagulation status, valve position, the presence of atrial fibrillation, and/or ventricular dysfunction<sup>3</sup>. The clinical presentation depends on the degree of occlusion of the valve and may manifest as dyspnea of varying degrees, embolism, pulmonary oedema, heart failure, shock and death. The modalities of treatment include thrombolysis, surgical thrombectomy of the valve or replacement of the valve<sup>4</sup>. The appropriate management of prosthetic valve obstruction is further challenged by the paucity of relevant studies in the literature.

#### Primary Objective

To study the outcome of prosthetic heart valve occlusions cases managed at our institution.

#### Secondary Objective

To assess the impact of clinical presentation, thrombus size, type of prosthetic valve, time interval since valve implantation, & echo findings on the outcome of management.

### II. Indentations And Equations

A. Study design : Retrospective study

B. Study participants Inclusion criteria: All cases of prosthetic valve occlusion admitted under cardiothoracic and vascular surgery department from January 2010 to December 2015.

C. Number of groups to be studied : One group

Identify groups with definition Study group – All cases of prosthetic valve occlusion admitted under cardiothoracic and vascular surgery department from January 2010 to December 2015.

D. Sampling

a. Sampling population: patients admitted under CTVS department between January 2010 to December 2015.

b. Sampling size calculation: All patients referred to the department of cardiothoracic and vascular

surgery meeting the inclusion and exclusion criteria between January 2010 to December 2015. The estimated sample size was approximately 50 to 60 patients based on previous records.

c. Sampling technique: All patients meeting the inclusion criteria were recruited into the study.

d. Brief procedure of the study

All patients meeting the inclusion & exclusion criteria patients were enrolled in the study. Data was collected from the admission records of patients with diagnosis of prosthetic valve thrombosis

Outcome of the management was recovery and discharge of the patient with or with out morbidity & mortality. Complications of management of stuck valve patients include cerebrovascular accidents, peripheral embolism, multiorgan dysfunction, infection.

All the data was analyzed using SPSS version 16 for Windows (SPSS, Inc., an IBM company, Chicago, Illinois, USA).

Study design and end points: Retrospective study

End point was outcome of the management

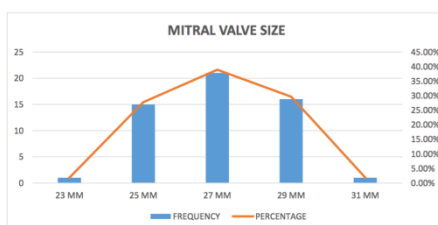
Data was collected from the previous admission records secured in Medical Records Department.

### III. Figures and Tables

	FREQUENCY	PERCENTAGE
MITRAL	49	75.38%
AORTIC	11	16.92%
MITRAL+AORTIC	5	7.69%
TOTAL	65	100%

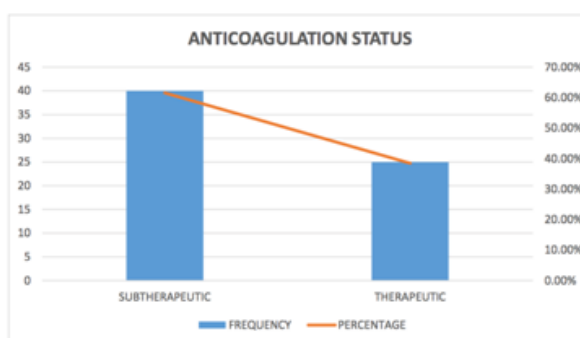
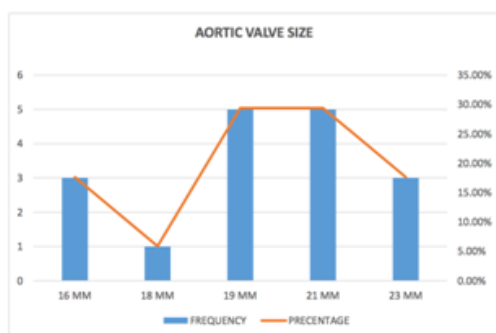
**IV. MITRAL VALVE**

MITRAL VALVE SIZE	FREQUENCY	PERCENTAGE
23 MM	1	1.85%
25 MM	15	27.78%
27 MM	21	38.89%
29 MM	16	29.63%
31 MM	1	1.85%
TOTAL	54	100%



AORTIC VALVE SIZE	FREQUENCY	PERCENTAGE
16 MM	3	17.65%
18 MM	1	5.88%
19 MM	5	29.41%
21 MM	5	29.41%
23 MM	3	17.65%
TOTAL	17	100%

ANTICOAGULATION STATUS	FREQUENCY	PERCENTAGE
SUBTHERAPEUTIC	40	61.54%
THERAPEUTIC	25	38.46%
TOTAL	65	100%



LV DYSFUNCTION	FREQUENCY	PERCENTAGE
SEVERE	4	6.15%
MODERATE	16	24.62%
MILD	9	13.85%
NORMAL	36	55.38%
TOTAL	65	100%

**E.) VALVE OPENING BASED ON ECHO**

VALVE OPENING	FREQUENCY	PERCENTAGE
SEVERLY RESTRICTED	30	46.15%
PARTIALLY RESTRICTED	35	53.85%

**F.) PRESENCE OF THROMBUS/PANNUS BASED ON VALVE POSITION**

POSITION	THROMBUS	PANNUS	BOTH
MITRAL	25	0	24
AORTIC	4	5	2
DOUBLE VALVE	4	0	1

POST INTERVENTION MITRAL GRADIENT mmhg	FREQUENCY
≤ 5	48
6 TO 10	2
11 TO 15	2

CPB TIME	FREQUENCY
< 150 MINS	14
151- 200 MINS	9
200-300 MINS	6
> 300 MINS	6
TOTAL	35

**XXIII. POST INTERVENTION AORTIC GRADIENT**

POST INTERVENTION AORTIC GRADIENT mmhg	FREQUENCY
15	7
18	1
20	3
25	1

**XXX. ACC TIME**

ACC TIME	FREQUENCY
< 100 MINS	18
101 - 150 MINS	11
151- 200 MINS	3
> 200 MINS	3
TOTAL	35

**XXIV. OUTCOME OF PVO MANAGED AT OUR INTERVENTION**

OUTCOME	FREQUENCY	PERCENTAGE
DISCHARGED	51	78.46%
EXPIRED	12	18.46%
PREINTERVENTION DEATH	2	3%
TOTAL	65	

**XXXI. CANNULATION SITE**

CANNULATION	FREQUENCY
CENTRAL	28
FEMORO-FEMORAL	7
TOTAL	35

**IV. Conclusion**

There are no randomized control trials available in the literature till date for prosthetic valve obstruction. What ever available in literature is observational studies or case studies .

The reported mortality in various literatures ranges from 30 % to as high as 100% in patients with prosthetic valve obstruction. Cheung et al, Bjork et al, Morano cabral et al, Marshal et al have reported such mortality rates. Copans and associates have reported 8% Mortality and 11 % mortality has been reported by

George konton et al. our study has reported overall mortality of 21.5 % in patients with prosthetic valve obstruction which is similar to others in literature.

In the surgical arm Deviri et al & Roudat et al have projected mortality rates of 12.5% & 10.3% respectively<sup>2</sup>. Our study shows 22 % mortality in patients directly subjected to surgery. And when patients with post thrombolysis failure are included in surgical arm then the mortality reaches 28%.

Analysis of our study patients revealed that they were more hemodynamically unstable than the thrombolysis arm. One of the major factors that correlated with mortality was the perioperative event. Almost 90% of patients experiencing either cardiac arrest or severe hypotension necessitating urgent bypass had a very poor post surgical outcome.

So the preoperative hemodynamic stability, urine output and perioperative events determines the outcome of our patients in surgical arm.

In thrombolysis arm various studies such as castilo et al, Lengye e al have projected the following results- 82 % success rate in thrombolytic arm, 12 % embolic risk, 10% mortality<sup>7,8</sup>

Our study shows 7 % mortality in patients subjected only to thrombolysis, when patients who where converted to surgery in view of failed initial thrombolysis are included the mortality goes up to 15% which is same as that reported in other studies<sup>5,6</sup>. Complication rater in our study in thrombolysis arm is around 25% and success rater is 81.5 % . These crude analytical values are similar to other studies mentioned in the literature.

From our study it is visible that thrombolysis arm has similar outcomes<sup>6</sup> as other international studies mentioned in literature but eh surgical arm has 10 % more mortality. It has been clearly pointed out that the perioperative events & preoperative hemodynamics plays a major role in post-surgical outcome. This association has not been found in other literatures.

In our study it is evident that thrombolysis and surgical management of prosthetic valve occlusion patients has almost equally favorable outcome in majority of the patients when the criteria for choosing the mode of management as per our protocol. Both thrombolysis and surgery are a good life saving procedure for potentially life-threatening complication of mechanical prosthetic valve.

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