

Outcome of Bioprosthetic Aorticvalvular Replacement: A Single Centre Experience

Parth Solanki

Authors Affiliation
Assistant Professor, Department of Cardio vascular and Thoracic Surgery, U.N. Mehta Institute of Cardiology and Research Center, (Affiliated to B.J. Medical College), Civil hospital Campus, Asarwa, Ahmedabad, Gujarat 380016; India.

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Parth Solanki
Assistant Professor
Department of Cardio vascular and Thoracic Surgery,
U. N. Mehta Institute of Cardiology and Research Center,
(Affiliated to B. J. Medical College), New Civil Hospital Campus, Asarwa, Ahmedabad, Gujarat 380016, India.
Email: parthdoc@yahoo.co.in

Received on 17.05.2017,
Accepted on 13.06.2017

Abstract

Context: Use of bioprosthetic valves instead of mechanical valves is increasing even in young patients apparently because of its advantages. *Aims:* We aimed to report a single centre experience of bioprosthetic valvular replacement and the complications in Western Indians. *Settings & Design:* Prospective, observational. *Methods & Material:* We have enrolled 54 patients undergoing AVR using biological valve implantation from May 2012 to April 2016 in a Medical college at Ahmedabad, Gujarat. Demographic, clinical and operative details of the patients were collected. *Statistical Analysis Used:* The statistical calculations were performed using SPSS software v 20.0 (Chicago, IL, USA) Quantitative data was expressed as mean \pm SD whereas qualitative data was expressed as percentage. Kaplan Meier was performed to assess survival of the population. *Results:* Overall 22.22% mortality was observed in the study cohort. The probability of freedom from a survival event at 5 years was 77.8% for patients with mitral valve bio prosthetic replacement. Post-operative complications observed were tachyarrhythmia 4 (7.4%), re-exploration 4 (7.4%), hemolysis 1 (1.85%) congenital cardiac failure 4 (7.4%), structural valve degeneration 8 (14.8%) and thromboembolism 4 (7.4%) in post-operative complication. *Conclusions:* In the present report, AVR with bio-prosthetic valve for patients <70 years old was associated with a low reoperation rate, post-operative complications and higher survival.

Keywords: Bio-Prosthetic Valve; Aortic Valve Replacement; Reoperation; Survival.

Introduction

Valvular coronary disease is one of the common conditions after coronary artery disease which operated by cardiologists and specialists frequently meet while managing with heart patients. Different interventional methods, for example, valvular repair, valvuloplasty, valve replacement are utilized to address the genuine regurgitation or stenosis happening because of valvular disease. Extensively, valvular regurgitation which to be specific mitral regurgitation (MR), aortic regurgitation (AR) and tricuspid regurgitation (TR) are managed either mechanical or bioprosthetic valve particularly in

adults [1]. Mechanical valve and Bioprosthetic valve was commonly used in Aortic valve replacement. However, both are known to have integral advantages and disadvantages [2,3].

Mechanical valves are require long lasting utilization of anticoagulation and are related with prolonged the danger of thromboembolism and thus bioprosthetic heart valves were intended to battle the thromboembolic complication of mechanical valves. Usage of bioprosthetic valves in place of mechanical valves is steeply increasing due to its advantages [4]. These valves are generally xenografts and are subjected to antigen masking through cross-linking. As a part of improvement glutaraldehyde

fixation was introduced in commercial bioprosthetic valves. In 1960, Prosthetic valve was first successfully implanted by Starr and Edwards and then after several changes was modifying by change in design and construction [5]. Use of bioprosthetic valves for aortic valve replacement (AVR) is highly popular due to less thrombogenic and limited uses of anticoagulation which prevent from haemorrhage compared to Mechanical Valve. In spite of the way that the consequences of more up to date era bioprosthesis in younger population are promising [6], more younger age remains a hazard figure for reoperation after implantation of a bio-prosthesis [7].

This planned observational study was intended to assess the early and mid-term results of as of now accessible bioprosthetic valves in patients requiring aortic valve replacement.

Materials and Methods

54 patients which operated for aortic with bioprosthetic valve replacement at our Institute from May 2012 to April 2016. In a predesigned proforma, documentation of patient point of view related details such as identification numbers, history, clinical findings, diagnostic test, pre-operative, operative findings, operative procedures, complications during stay in the hospital and during subsequent follow-up period. Post-operative follow up was performed to record the post discharge complications. Inclusion

criteria were patients having stable hemodynamics, normal blood investigations, and patients requiring valvular replacement with biological valve prosthesis. Patients with associated coronary artery disease were also included. Patient who are in cardiac failure, unable to tolerate the valvular replacement, having chronic liver disease, chronic renal disease and abnormal blood investigations were barred from the study.

Statistical Analysis

The statistical calculations were performed using SPSS software v 20.0 (Chicago, IL, USA) Quantitative data was expressed as mean \pm SD whereas qualitative data was expressed as percentage. Kaplan Meier was performed to assess survival of the population.

Result

Patient Characteristic and Symptoms

Study population related information such as Demographic details, Symptoms, risk factors and functional class presented in table 1. The mean age of the study cohort undergoing AVR with bioprosthetic valve was 52.37 ± 9.15 (range 34 to 71 years), where, 21 (38.89%) had New York Heart Association (NYHA) class III or IV disease and 12 (22.22%) patients had an ejection fraction of $<40\%$. Additionally, the patients had aortic stenosis.

Table 1: Mitral valve Bio prosthesis Patient of Demographic Details

Variable	N (%)
Age	Mean : 52.37 ± 9.15
Gender	
Male	44 (81.48)
Female	10 (18.52)
Diabetes	16 (29.63)
Hypertension	30 (55.56)
COPD	4 (7.4)
Renal Disease	4 (7.4)
Chest Pain	10 (18.52)
Pallor	4 (7.4)
Breathlessness	26 (48.15)
Palpitation	34 (62.96)
Fatigability	8 (14.81)
Mortality	12 (22.22)

Table 2: Complication of Mitral valve Bioprosthetic Patients

Early Complication		Complication		Late Complication	
Tachyarrhythmia	4 (7.4)	Congenital Cardiac failure		4 (7.4)	
Re-exploration	4 (7.4)	Structural Valve Degeneration		8 (14.8)	
Haemolysis	1 (1.85)	Thromboembolism		4 (7.4)	

The most common signs and symptoms observed in patients at the time of hospital admission were: breathlessness (48.1%), palpitation (63%), fatigability (14.8%), and chest pain (18.5%). The prevalence of diabetes, hypertension, chronic obstructive pulmonary disease and renal disease were 29.6%, 55.6%, 7.4% and 7.4% respectively.

Post-Operative Complication

Post-operative complications observed in cases of aortic valve bio prosthesis were tachyarrhythmia 4 (7.4%), re-exploration 4 (7.4%), hemolysis 1 (1.85%) in post-operative complication.

Late Complication

Out of 54 patients, some patient observed with late complication such as congenital cardiac failure 4 (7.4%), structural valve degeneration 8 (14.8%), thromboembolism 4 (7.4%).

Hospital Mortality and Survival Rate

There were 12 (22.22%) deaths due to cardiac cause of surgery observed at our institute. The Kaplan-Meier curves for the incidence associated with mitral valve bio prosthesis of patients having survival rate. The probability of freedom from a survival event at 5 years was 77.8% for patients with mitral valve bio prosthetic replacement (Figure 1).

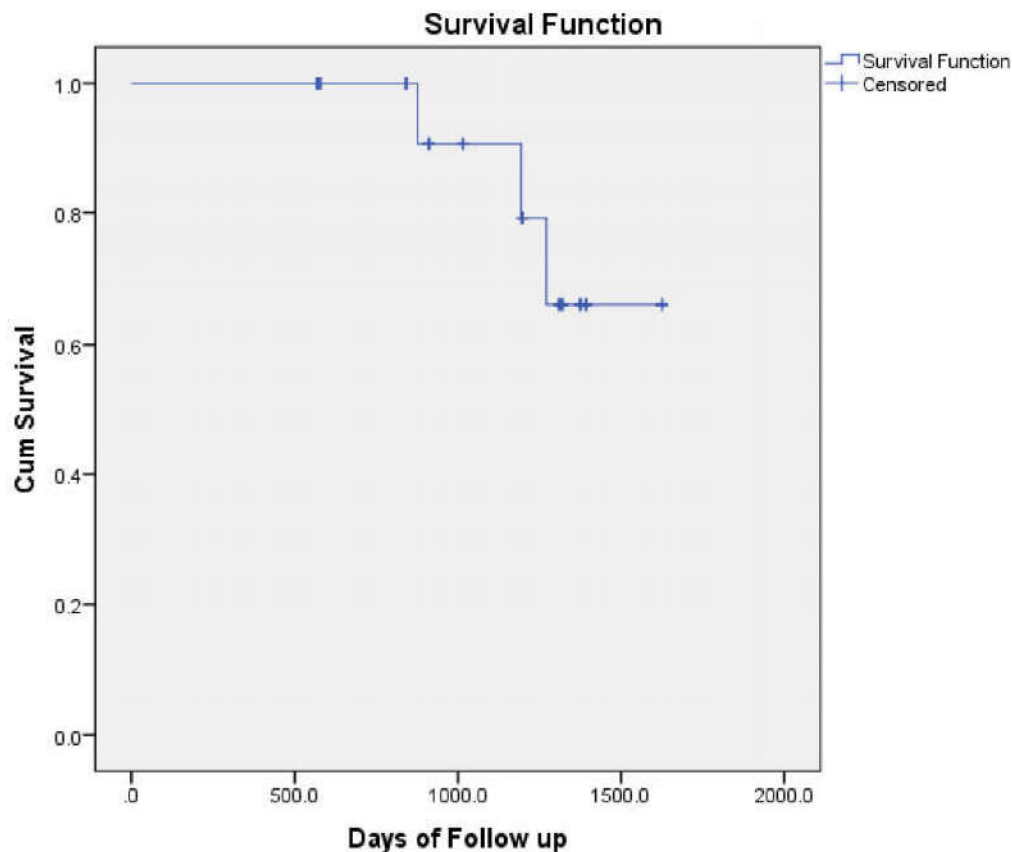


Fig. 1:

Discussion

The ultimate aim of heart valve surgery is to extend life expectancy and improve quality of life. This study demonstrated that among middle aged patients, survival does not appear to be affected by Bioprosthesis valve. Sharma et al, reported that the choice of prosthesis does not have a significant effect on midterm survival after valve replacement in patients younger than 65 years of age [8].

However, our study shows that in the Indian scenario survival in the first 5 years is more with bioprosthetic heart valves as they are not associated with high incidences of severe bleeding and stroke and fatal complications such as valve thrombosis which are more associated with mechanical valves because of strict anticoagulation protocol, this is also due to fact that population living in remote rural areas do not have access to medical facilities and they are always at risk of treatment discontinuation and are frequently lost to follow

up. Bioprosthetic valve patients, on the other hand, were more fearful of the need for reoperation. According to Perchinsky *et al.*, 97% of patients reported that they would make the same decision again with regard to valve replacement, with no significant difference between the two groups [9].

Overall in present study aortic valve replacement with bioprosthetic valve in <70 years of age have emerged as an fair option due to its association with lower mortality and lower immediate and mid-term post-operative complications.

Conclusion

In conclusion we may state that bioprosthetic heart valves at aortic position seem have fair prognosis in Indian scenario because of low incidence of mortality and valve related events and better quality of life.

Key-Messages

- Bio-prosthetic valves in younger patients (<70 years) are having better survival with only 22.22% mortality
- These patients are less subjected to post-operative complications
- However rate of atrial fibrillation after bio-prosthesis in AVR was higher (37.03%).

Referance

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