ORIGINAL ARTICLE

Aortic Aneurysm Following Aortic Valve Replacement

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ABSTRACT

Background: Bicuspid aortic valve disease predominantly undergo aortic valve replacement. This genetic theory supposed bicuspid aortic valve aoropathy a congenital disease of vascular connective tissues that requires progressive treatment recomenditions for a certain syndrome. But some of the investigators arised questions to this progressive surgery option.
Aim: To examine the aortic aneurysm after aortic valve surgery.
Methods: This was an observational study where the opted design was retrospective. All the patients' records were retrieved from the hospital record database for three years starting from Sep 2013. The duration of the study was of six months. The exclusion criteria include all the patients with renal disease, nephropathy, impaired hepatic function, and impaired renal function whereas all patients of both genders who underwent AVR surgery were included in this study.
Results: A total of 120 patients were recruited for this study. The mean age was 51.3±6.8 and the study contained higher number of Males participants i.e. 80(66.6%) The mortality rate can be compared easily through the outcomes. Three patients expired unexpectedly during hospital stay due to lethal arrhythmia. Autopsy evaluation was done for all these patients deprived of indication of aortic dissection or rupture. One patient in tricuspid aortic valve group died due to major stroke after surgery. Later on, 2 died in this group duringhospital stay due to other complications but no death was due to aortic complication.
Conclusion: The patients in both groups had relatively less chances of adverse aortic complications after isolated AVR. On these findings in conventional handling of ascending aorta at during AVR surgery is reasonable in patients having aortic valve stenosis.
Keywords: isolated AVR, bicuspid aortic valve, aortopathy, bicuspid aorta

INTRODUCTION

Subsequently isolated aortic valve replacement (AVR) the bicuspid aorta was planned to dilate gradually at a higher rate, usually the process which is followed by an elevated hazard with aggressive aortic actions[1,2]. This is actually based on genetic theory of aortopathy in bicuspid aortic valve disease predominantly[2,3,4]. This genetic theory supposed bicuspid aortic valve aoropathy that requires progressive treatment recomenditions for a certain syndrome[5,6]. But some of the investigators arised questions to this progressive surgery option[7]. Recent advancement has more focused and related understanding and functions in-vivo& in-vitrotrials[8,9]. That also provided with hemodynamical insight of different clinical forms of diseases[10,11]. The main of the study was to evaluate the aortic aneurism in the patients with aortic vale surgery, bicuspid or tricuspid.

MATERIAL AND METHODS

This was an observational study where the opted design was retrospective. All the patients' records were retrieved from the hospital record database for three years starting from Sep 2013. The duration of the study was of six months. The exclusion criteria include all the patients with renal disease, nephropathy, impaired hepatic function, and impaired renal function whereas all patients of both genders who underwent AVR surgery were included.

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Demographics and diagnostic record were collected and noted electronically. It was made sure that all standard operating procedures were followed for the laboratory diagnostic tests. In 120 patients with ascending aortic dilatation of 40-50mm undergoing isolated AVR surgery was done. Additionally all cases had bicuspid and tricuspid aortic valve stenosis were evaluated. This recognition of bicuspid or tricuspid vale was made on intraoperative direct inspection. Also the patients were divided in two groups based on bicuspid and tricuspid aortic valve i.e. Group I and Group II. Ethical considerations were taken in to account by taking approval Hospital ethical Committee. Individual patient's informed consent was waived.
Statistical analysis: All the collected data was stored electronically & analyzed later by using SPSS version 20. Descriptive statistics were applied to calculate mean and standard deviation. Frequency distribution and percentages were calculated for qualitative variables like gender etc. Over all a P values less than 0.05 was considered statistically significant.

RESULTS

About 120 patients were included with the mean age was 51.3±6.8 and the study contained higher number of Males participants i.e. 80(66.6%) The baseline demographic and intraoperative characteristics for the patients were given in table 1. The outcomes related to hospitalization were given in table 3. The mortality rate can be compared easily through the outcomes. Three patients expired unexpectedly during hospital stay due to lethal arrhythmia. Autopsy evaluation was done without indication of aortic dissection / rupture. In tricuspid aortic valve group, 1 patient died due to

stroke and 2 died due to complications during hospital stay. No death occurred due to aortic complication.

We observed the average length of follow up of patients that were of comparable duration between groups 1 to 3 years in the group I and similar in group II. A total of 11 patients in the group I and 15 patients in group II expired during follow-up. The causes of deaths were 60% cardiac related in group I. Cardiac and non-cardiac causes were almost equally distributed in group II, and the largest proportions of tricuspid aortic valve patients died of malignancies (n ¼ 14 patients). More important, 6 patients in the tricuspid aortic valve group and 3 patients in the bicuspid aortic valve group experienced sudden cardiac death. More- over, 2 patients in the tricuspid aortic valve group died of chronic type A aortic dissection after redo surgery.

Table 1: baseline demographic and diagnostic characteristics for HCV patients were given in table 1.

Characteristic/parameter	Bicuspid aortic valve group	Tricuspid aortic valve	Significance
Age (Mean)	51.3 + 8.8	54.45 + 9.2	0.003
Males	48(80%)	32(53.3%)	0.001
BSA	1.5 + 0.3	1.6 + 0.1	0.773
NYHA class III/IV	30	35	0.034
Ascending aorta, mm	44 + 2.6	43 ± 3.25	0.58
Ascending aorta >45 mm	23 (39%)	24 (40%)	0.78
Arterial hypertension	29 (48.3%)	30(50%)	0.31
Diabetes	7 (11.6%)	9(15%)	0.73
History of smoking	38 (63.3%)	40(66.6%)	0.55

Table 2: Outcomes related to hospitalization.

Variables	Group I	Group II	Significance
Reoperation for bleeding,	2 (3.33%)	3 (5%)	0.20
Low-cardiac output syndrome,	3 (5%)	6 (10%)	0.60
Dialysis-dependent renal failure	1 (1.66%)	1 (1.66%)	0.80
Stroke	1 (1.66%)	2 (3.33%)	0.60
Tracheotomy,	1 (1.66%)	2 (3.33%)	0.43
Hospital stay, days	15+6	16+7	0.53

DISCUSSION

This study was planned to evaluate the aortic aneurism after AVR. We have observed that the treatment used for dilated aorta in bicuspid aortic valve disease patients was controversial. [14] It was proposed an acute aortic complication risk at increasing level for group I patients. In fewer series it was included with higher prevalence of aortic dissections[15,16].

These studies may over estimate the risk for group I patients due to large necropsy studies. During follow up we observed an elevated risk of acute aortic complication in larger dimension of proximal aorta in patients in both groups. But the direct evidence is absent. For congenital origin of bicuspid aortic valve aortopathy was strongly recommended due to the dilatation of proximal aorta with no ECG criteria[17].

Some of the work available in literature from Robicsek and his colleagues have focused more on the clinically normal function of group I patients and pattern of trans-valvular flow[8,9,10,11]. These trials displayed steadily unconventional turbulent trans-valvular flow in clinically normal bicuspid aortic valve condition[8,9].

Furthermore, durable connection was validated among particular trans-valvular flow design and segmental dilatation of proximal aorta in bicuspid aortic valve disease. [10-11] In one of the other studies, one main study had rivaled bio-molecular modifications in ascending aorta in cases of either bicuspid or tricuspid aortic valve stenosis during AVR surgery[19,20,21,22].

We found that after AVR surgery, continuous dilatation of ascending aorta was present in bicuspid group as compared to tricuspid group. This was also previously done and published by other studies[1,2]. But of those studies the sample size was limited. Similarly our sample size is also limited or less in this way we cannot generalize the findings to a larger group or to whole population.

In our trial, we reported the lower hazard of adversarial aortic complications after three years follow-up of AVR surgery. Also, we did not confirm any documented concurrent mild-to-moderate dilatation of ascending aorta and aortic dissection in any group. Hence thishelps to support our last assumptions that mild-to-moderately dilated ascending aorta is similar in both groups.

CONCLUSIONS

We may conclude in our study that the patients of both groups were on relatively less chance adverse aortic outcome after isolated AVR surgery. It is finalized that conventional management protocol of ascending aorta during AVR surgery in patients with aortic valve stenosis is reasonable.

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