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The fate of untreated moderate rheumatic aortic valve incompetence after mitral valve surgery: A one-year follow-up study

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ABSTRACT

Background: Most of the previous studies agreed that the moderate aortic Regurgitation (AR) has a slow progression over a very long period of time. There is no major consensus on how to deal with concomitant moderate rheumatic AR during mitral valve surgery. The current work evaluates the course of untreated moderate rheumatic AR following mitral valve surgery over a period of 1 year.

Methods: We prospectively enrolled 30 patients who had moderate rheumatic AR associated with pure rheumatic mitral stenosis in 15 patients (group S) and 15 patients with pure rheumatic mitral incompetence (group R). Quantification of the degree of the AR was done by echocardiography using the percentage of the width of the regurgitant get to the width of the left ventricular outflow tract (LVOT) method. Clinical and echocardiographic follow-up were done over 1 year.

Results: There were no early or late postoperative deaths and we achieved 100% follow-up. No patient had aortic valve replacement (AVR) after one year. Preoperatively, the width of the regurgitant jet was 34.67 ± 2.72% and 35.73 ± 1.87% in group S and group R respectively with no statistically significant difference ($p = 0.22$). Postoperatively after 1 year follow up the width of the regurgitant jet in group S increased significantly to 37.27 ± 4.67% ($p = 0.005$), while in group R almost remained unchanged 34.73 ± 4.13% ($p = 0.3$). However. both figures are still in the moderate category between (≥25 to ≤64%).

Conclusions: After 1-year follow-up, the moderate rheumatic AR didn't increase to the severe category necessitating AVR. Longer follow-up duration is recommended.

1. Introduction

Rheumatic fever represents the most important reason of valvular heart diseases in developing countries including Egypt. The aortic and the mitral valves are concomitantly affected in about 30% of patients [1,2]. Accordingly, aortic valve affection

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usually encountered in a considerable number of patients during mitral valve intervention. At the time of mitral valve surgery, it is easy to take a decision to deal with the 2 ends of the aortic regurgitation (AR) severity spectrum, but the dilemma will appear when we have moderate non-hemodynamically significant AR [3,4].

Till now, a major consensus on how to deal with the moderate rheumatic affection of the aortic valve at the time of mitral valve surgery doesn't exist. While the European guidelines reported intervention only to moderate AR in case of patients with connective tissue disorders and aortic root diseases [5], the American ones made it reasonable to repair or replace the moderately regurgitant aortic valve at the time of cardiac surgery due to other causes (class IIa) [6] and more studies are recommended to reach a clear view (level of evidence C).

To add or not to add an aortic valve replacement (AVR) for moderately regurgitant rheumatic aortic valve must be weighted against several issues like understanding the natural history of moderate rheumatic AR, peri-operative morbidity, and mortality of double valve intervention [7] and socioeconomic interactions.

2. Patients and methods

Through the cardiothoracic surgery department in National Heart Institute, we prospectively enrolled 30 patients who had undergone mitral valve surgery due to either severe rheumatic mitral valve stenosis or severe rheumatic mitral valve incompetence with concomitant moderate rheumatic aortic valve regurgitation. Patients with mitral and aortic valve pathology other than rheumatic, aortic regurgitation more than moderate and concomitant coronary artery disease were excluded.

The study population was divided into two groups; group (**S)** included 15 patients with pure mitral stenosis and group (**R**) included 15 patients with pure mitral incompetence and both groups had associated moderate AR.

Preoperatively all patients had comprehensive clinical, laboratory and transthoracic echocardiographic investigations. Aortic regurgitation was classified as moderate on the basis that, the width of the regurgitant jet occupies between ($\geq$25 to $\leq$64%) [6] of the total width of the left ventricular outflow tract (LVOT).

Intraoperatively; all patients had a trans-esophageal echocardiographic reassessment to confirm the diagnosis, other operative variables such as cardiopulmonary bypass (CPB), aortic cross clamp durations, ICU stay and using of inotropic support had been evaluated.

All patients were operated utilizing median sternotomy approach and full CPB. The techniques of myocardial protection used were moderate systemic hypothermia (30–32 °C), intermittent antegrade cold crystalloid blood enriched cardioplegia and topical cooling by ice slush.

Postoperatively, all patients were subjected to thorough clinical evaluation in addition to detailed trans-thoracic echocardiography that made stress on the degree of AR, that evaluation made at six and twelve months time intervals. All echocardiographic evaluations were done by two senior echocardiographers and utilized the same echocardiography machine. We followed the European Association of Echocardiography Recommendations for the assessment of valvular regurgitation [8].

Vitamin K antagonists (VKA)were prescribed postoperatively. Three months regimen for patients who were not suffering fromatrial fibrillation (AF) if annuloplasty rings were used for mitral valve repair or patients who received bioprosthetic heart valves. Patients with chronic AF or who received mechanical heart valves had a lifelong anticoagulation. Anticoagulated patients were followed up in the outpatient clinic on a monthly base using the International Normalized Ratio (INR) between 3 and 3.5 to adjust anticoagulation dosage [9].

Prophylaxis against rheumatic fever attacks and endocarditis were applied according to the guidelines [10,11].

SPSS software (SPSS Inc., Chicago, Illinois) was used to manipulate resultant data. The data was displayed as a percentage and a mean ± standard deviation. Statistical comparison was carried out for obtained data using paired student test within the same group and unpaired test between the groups. Chi-square test was used for non-parametric data. A statistically significant p-value was considered when p was less than 0.05.

3. Results

We didn't have intra or postoperative mortality, all patients were alive by the end of one year. We also could achieve 100% follow-up for all patients. None of our patients required redo aortic valve surgical intervention.

Table 1
Demographic data in both groups.

	Group S		Group R		P value
Age					
Mean ± SD	38.40 ± 14.69 years		39.47 ± 11.26 years		0.83
	No	%	No	%	
Sex					
Male	3	20.0	9	60.0	0.02
Female	12	80.0	6	40.0	0.01