

## Original Article

# Surgical pathology of excised heart valves in a referral hospital in Iran.

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## Abstract

**Objective:** Assessment of surgical pathology of excised heart valves in a referral hospital in Iran in a five years period.

**Methods:** This retrospective descriptive study was done from 2002 to 2005 in Rajaie heart center in Tehran, Iran. Surgery and pathology records of patients who underwent valve replacement or repair surgery were reviewed.

**Results:** Of 1563 patients 738 (47.2%) underwent mitral, 565 (36.1%) aortic, and 215 (14%) multivalve operation. Most common pathology of mitral valve was rheumatic (68%), while degenerative calcific

pathology was dominant in aortic valve (52%). Rheumatic involvement was 46%, and degenerative pathology was common in tricuspid and pulmonary valves (50% and 67%, respectively). Time trend analysis shows no significant variation in excised valves pathology or pattern from 2002 to 2005 ( $p=0.112$ ).

**Conclusion:** Rheumatic pathology in excised heart valves is still common in this referral heart center in Iran, and no obvious change in this pattern was found during a 5 years period. (Rawal Med J 2007;32:70-72)

**Key Words:** Mitral stenosis, aortic stenosis, aortic regurgitation, mitral regurgitation.

## INTRODUCTION

Changing disease patterns and an aging in developed countries have altered the relative frequency of the major causes of cardiac valve disease in the late 20<sup>th</sup> century. In the past several decades, rheumatic heart disease has declined markedly in developed countries. This disease most frequently affects mitral valve, and to a lesser extent aortic and/or tricuspid valves.<sup>1</sup> Recently, degenerative valve diseases are the most common reason for valve surgery in North America and most of European countries.<sup>1</sup> The most important etiology of multi-valvular

involvements is rheumatic heart disease.<sup>1</sup> Prevalence and geographic distribution of this disease has changed considerably through the time. However, in some European countries as Italy,<sup>5</sup> some developing and underdeveloped countries as India<sup>6</sup> and Pakistan<sup>7</sup> rheumatic diseases are still the most common cause of valvular involvement. There is not enough data about valvular involvement pattern and its etiology in Iran. The aim of this study was, therefore, to investigate surgical pathology of excised cardiac valves in a referral heart hospital in Tehran, Iran.

## METHODS AND MATERIALS

## Study of surgical pathology of excised heart valves

This retrospective descriptive study was carried out from 2002 to 2005 in Rajaie heart center in Tehran, Iran. Surgery and pathology records of patients who underwent valve replacement or repair surgery during this period were reviewed. A total of 1591 patients underwent single or multivalve surgery and 28 were excluded from study due to incomplete medical record or unknown surgical pathology. Baseline characteristics, type of surgery, and surgical pathology of excised valves were recorded. Data was analyzed by SPSS v. 13.5 (SPSS Inc,

Chicago, IL) statistical package. Comparisons of various pathologies among different valves anatomy were done by Chi-square or Fisher's exact tests.

## RESULTS

Of total of 1563 patients, 756 (47.7%) were male and 817 (52.3%) were female. Mean age was  $45.1 \pm 16$  years. Mitral valve with 738 (47.2%) and aortic valve with 565 (36.1%) patients were the most commonly removed valves (table 1).

**Table 1. Characteristics of different excised valve pathologies.**

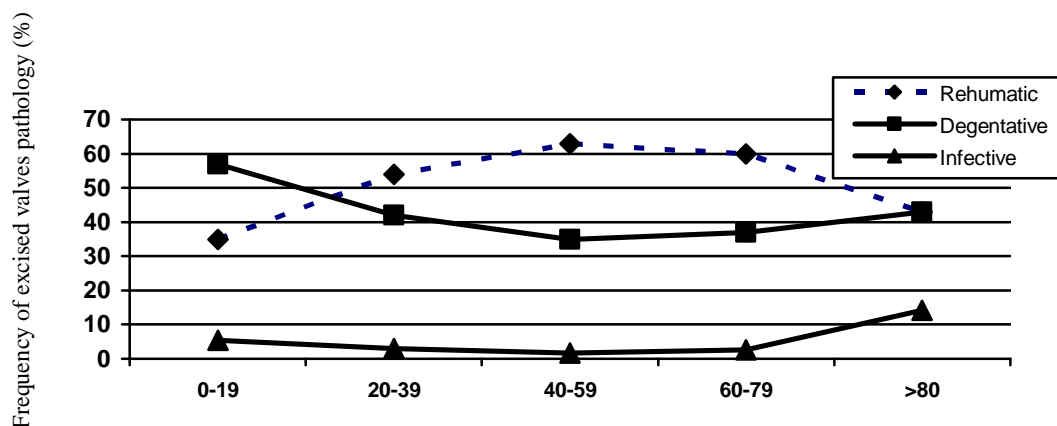
Valve pathology Variables	Rheumatic N=831	Degenerative N=690	Infective N=37	Congenital N=5	P valve
<b>Gender (M/F)*</b>	44/56	65/35	59/41	80/20	0.008
<b>Age (Years)</b>	46.2 $\pm$ 14.8	43.7 $\pm$ 17.1	42.3 $\pm$ 21.6	20.0 $\pm$ 14.8	0.0001
<b>Involved valves:</b>					0.0001
<b>Mitral (n=738)</b>	68%	29% <sup>a</sup>	2.3%	0.1%	
<b>Aorta (n=565)</b>	45.5%	52.0% <sup>b</sup>	1.9%	0.5%	
<b>Mitral+Aorta (n=215)</b>	61.0%	37.2%	1.8%	0%	
<b>Tricuspid(n=22)</b>	45.5%	50.0%	4.5%	0%	
<b>Pulmonary (n=9)</b>	0%	66.7%	22.2	11.1%	

a: Degenerative myxoid

b: Degenerative calcific

Most common pathology in excised mitral and combined mitral-aortic valves was rheumatic. In excised aortic valves, degenerative calcific pathology was dominant (52%), followed by rheumatic involvement (45.5%). A similar pattern was seen in tricuspid valve. In pulmonic valve, degenerative pathology was common finding, followed by infective pathology (table 1).

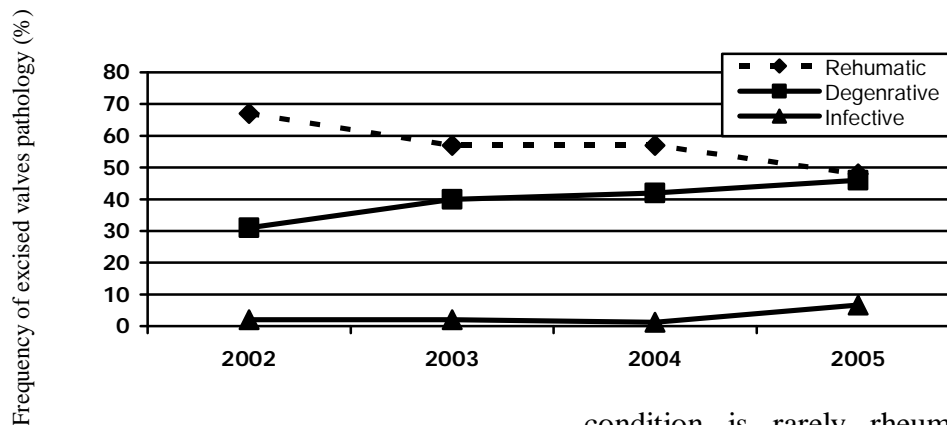
In patients younger than 19 years old degenerative pathology was dominant, but in patients between 20 and 79 years old -in majority of patients- rheumatic valve pathology was the most frequent finding (fig. 1). In patients older than 80 years old, rheumatic involvement decreased, and degenerative and infective pathology increased.



**Fig. 1. Excised cardiac valve pathologies in different age groups.**

There is no statistically significant change with time in three major pathologies ( $p > 0.05$ ) from 2002 to 2005 (fi. 2).

**Figure 2. Frequency of excised cardiac valve pathologies.**



## DISCUSSION

The results of this study show that, mitral valve surgery still is the most frequent cardiac valve surgery in our hospital. Also, we found that rheumatic pathology is the most common finding in mitral and multi-valve operations, and ranked in second (with small difference from degenerative) in aortic and tricuspid valves surgery. We observed that except in very young and very old patients, rheumatic involvement was the most frequent pathology. There was no obvious change in relative frequency of excised valve pathologies during the study period. Our hospital is the largest referral heart center in Iran, but due to governmental and insurance support, most referring patients belong to low income population group. Thus, the relative frequency of rheumatic pathology in our results may be in part attributed to this referral pattern.

Mitral stenosis is mostly due to rheumatic fever and rheumatic involvement is evident in the most of involved mitral valves at the time of surgery. One of the main etiologies of mitral regurgitation is also rheumatic, nevertheless, mitral valve prolapse syndrome and ischemic heart diseases is known to have a predisposing role in mitral prolapse. Aortic stenosis without mitral valve

condition is rarely rheumatic and is mostly congenital or degenerative. As for aortic regurgitation, the most common etiology is rheumatic fever. Tricuspid stenosis, almost always, has a rheumatic etiology but tricuspid regurgitation is mostly secondary to right ventricle enlargement due to pulmonary hypertension. Finally, the most common etiology of multi-valvular involvement is also rheumatismal.<sup>5</sup>

The decline in prevalence of valvular diseases and tendency towards change in etiologies of valvular disease has been well documented as in Myo-clinic study during 21 years.<sup>6</sup> Another study from Amsterdam in 1998 showed that rheumatic etiology was a rare pathology in cardiac valves, except for the regions which rheumatic fever was endemic.<sup>7</sup> Another study showed an increase in degenerative changes leading to aortic stenosis and decrease in rheumatic etiologies. A report from Thailand showed 56% of valve stenosis was rheumatic and 44% were degenerative in origin.<sup>9</sup> Among simultaneous stenosis and regurgitation cases, 85.3% were rheumatic and 14% were degenerative and among pure aortic regurgitation cases, 41% were associated to rheumatic etiology, 29% to endocarditis, 17% to ring enlargement, 6% to calcified bilateral valve and 6% to other etiologies.<sup>9</sup>

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