COMPARISON OF TRANSTHORACIC AND TRANSESOPHAGEAL ECHOCARDIOGRAPHY FOR DETECTION OF ABNORMALITIES OF PROSTHETIC VALVES IN THE MITRAL AND AORTIC POSITIONS.

THESIS

Submitted in partial fulfilment

of the Master Degree of Cardiology

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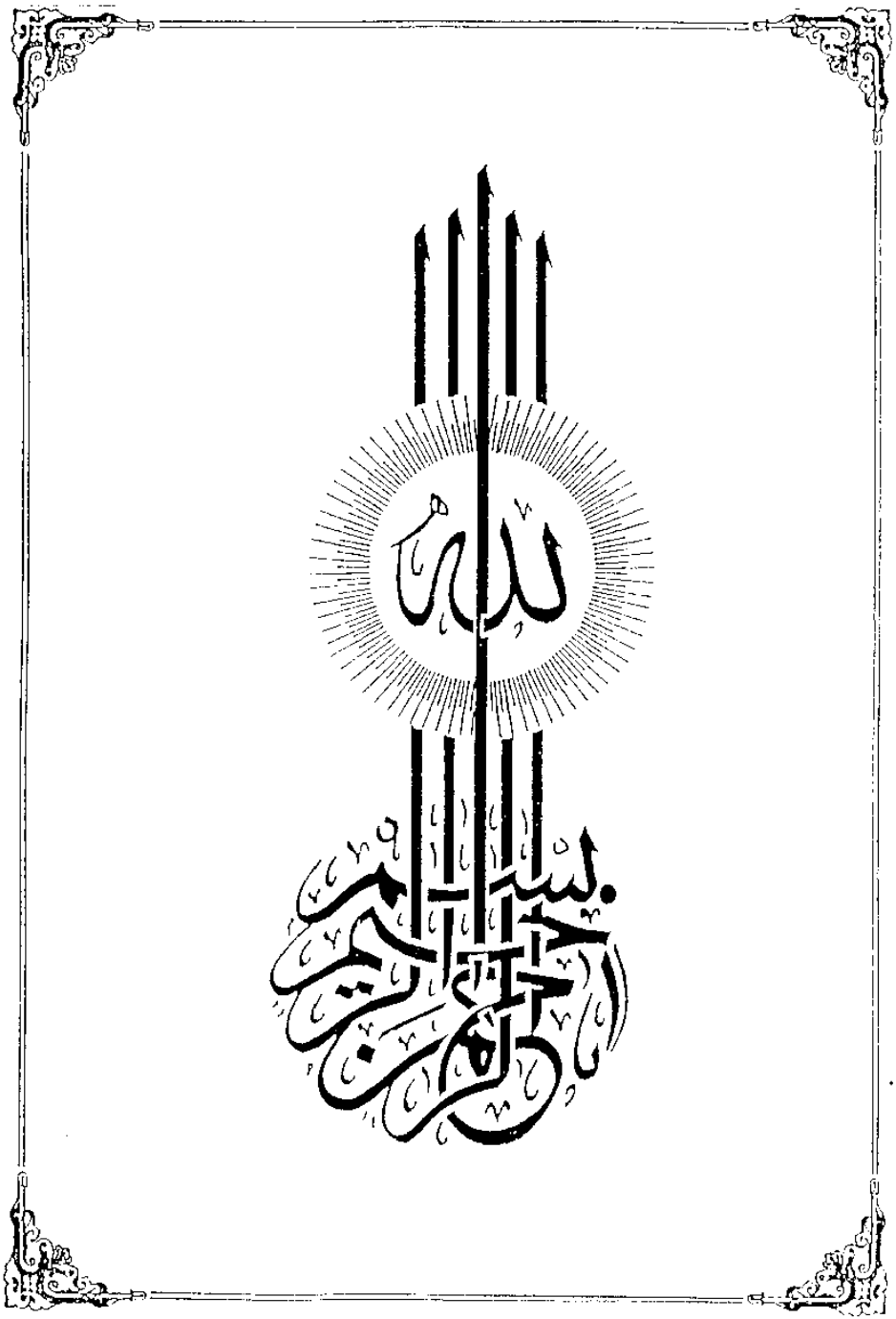

Dedicated To
My
Father And Mother

LIST OF CONTENTS

LIST OF ABBREVIATIONS

AVP:	Aortic valve prosthesis.
CW:	Continuous wave.
LA:	Left atrium.
LV:	Left ventricle.
MVP:	Mitral valve prosthesis.
PVL:	Paravalvular leak
PW:	Pulsed wave.
Quest:	Questionable
RA:	Right atrium.
RV:	Right ventricle.
TEE:	Transesophageal echocardiography.
TTE:	Transthoracic echocardiography.
Veg:	Vegetation
2D:	Two dimensional.

ERRATA

Page Number	Line Number	Error	Correction
Acknowledge-ments	2	for	to
"	7	for	to
"	9	advises	advice
"	10	in	of
"	18	incorrecting	in correcting
1	15	provided	provide
3	7	wre	were
3	9	are	is
5	2	font	front
9	1	gave	gives
46	4	varioustypes	various types
53	4	ant	and
55	4	day	days
64	14	isto	is to
77	15	dose	does
77	17	exceed	exceeds
86	13	studies	study
88	16	particularly is	is particularly
89	19	the position	the TEE position
96	2	compare between the	Compare the
103	13	detection of it with	detection with
108	19	the other in	the other was in
110	6	which was	This was
112	2	one in	one was in
113	19	mapping	the mapping
116	9	position 57%	position was 57%
121	8	opinian	opinion
121	17	signs	sign
127	3	agree to	agree with
128	8	Aswell as	In addition

Page Number	Line Number	Error	Correction
131	5	resemble	resembled
133	19	Herrera	Herrera's
137	5	was	is
137	7	had	has
137	20	was	is
138	11	in evalualion	in the evaluation
140	14	evaluation	evaluating
Fig 25	5	Statment (A)	Statment (C)
Fig 25	7	Statment (C)	Statment (A)

INTRODUCTION
&
AIM OF THE STUDY

INTRODUCTION

Two-dimensional echocardiography is the diagnostic procedure chosen for the evaluation of prosthetic valve abnormalities. However, transthoracic echocardiography (TTE) may be limited owing to acoustic shadowing and poor acoustic windows. Some of these limitations may be overcome by transesophageal echocardiography (**Daniel et al., 1993**).

However, transthoracic Doppler echocardiographic examination has become an integral part of the investigations performed in patients with mitral valve prostheses; whereas transesophageal echocardiography provides a unique window for achieving a clear view of the mitral valve prostheses (**Khandheria et al., 1991**).

With regard to prosthetic aortic valves, the ultrasound beam often encounters this valve in an oblique position. This relation precludes a proper evaluation of valve function. In this regard, transesophageal echocardiography does not provided additional information to the aortic regurgitant already obtained by transthoracic echocardiography (**Herrera et al., 1992**) .

AIM OF THE STUDY

The aim of this study is two fold:

a- To compare the findings visualized by transthoracic echocardiography with those of transesophageal echocardiography in 35 randomly selected patients with suspected prosthetic valves malfunction in mitral and aortic positions.

b- To verify the findings of the above methods during reoperation or necropsy.

REVIEW OF LITERATURE

Historical Background

Echocardiography is a unique noninvasive method for imaging living heart. It is based on detection of echoes produced by a beam of ultrasound (very high frequency sound) pulses transmitted into the heart (**Kisslo et al.,1988**).

Echocardiography has developed as a direct result of refinement in sonar, an under water detection system used in submarine warfare. Developments in sonar supplied the advances that wre essential to the instrumentation for application to medical diagnosis. Another important step was the use of pulsed echo ultrasound to detect flows in metal are reported by firestone in 1945 (**Robert et al.,1993**). In 1954 the field of echocardiography emerged from the work of the Swedish investigators Edler and Hertz. It was used primarily to diagnose mitral stenosis and pericardial effusion (**Edler et al.,1961**). This limited role caused most physicians to avoid the expense of purchasing appropriate equipment.

In the middle to late 1960's, Feigenbaum and Gramiak and Wagg rejuvenated the field with original research that markedly extended the scope of diagnostic possibilities and clearly delineated the techniques required to avoid misdiagnosis (**Feigenbaum et al.,1981**).

The medical community, however was slow to recognize their efforts; they had been "burned" by other "indirect" noninvasive techniques.

During the early 1970's the technique became more widely accepted. Better equipment and documented clinical effectiveness led to the development of "noninvasive" or echocardiography laboratories at most major hospitals.

The development of two dimensional images by Bom and associates in Rotterdam helped to overcome a major shortcoming of M - mode echocardiography; the inability to adequately visualise geometric configuration. Although Bom's transeducer design was not readily applicable to adult cardiology, his pictures stimulated the development of mechanical and phased array sector scanners, which are standard today (**Kraus et al.,1985**).

Anatomical Background

The Heart In The Chest

The heart lies within the pericardium, in the mediastinum, behind the sternum and ribs, between the lungs, and in font of the spine. It is suspended at its base by the great vessels and inferiorly is supported by the diaphragm. It occupies an asymmetrical position with its apex directed primarily to the left anteriorly, and slightly inferiorly. The base of the heart is directed toward the cardiac apex perpendicular to the long axis of the heart. The left cardiac border is formed by the left ventricle, and the right border is formed by the right atrium. The left atrium is positioned directly posteriorly in front of the spine and esophagus. The right ventricle is the most anterior chamber, lying directly behind the sternum (**Salcedo et al., 1985**).

Anatomy of the mitral valve:

This bicuspid valve separates left atrium from left ventricle; it admits the tips of two fingers. The cusps are a large anterior (septal) and a small posterior. The bases of the cusps are attached to the margins of the atrioventricular orifice. Usually the attachments of the two cusps are continuous around the orifice, but sometimes they fail to meet and a small accessory cusps fills the gap between them. The anterior cusp of the mitral valve is thicker and more rigid than the