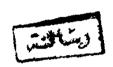
ASSESSMENT OF MYOCARDIAL INVOLVEMENT IN RHEUMATIC HEART DISEASE USING RADIONUCLIDE PERFUSION STUDY

Thesis Submitted for Partial Fulfilment of M.D. Degree in Cardiology



 B_q

Ghada Samir El Shahed M.B. Bch., MS. (Cardiology)

Supervised By



6/6.124 Professor Amal Ayoub
Professor of Cardiology
Ain Shame University Ain Shams University

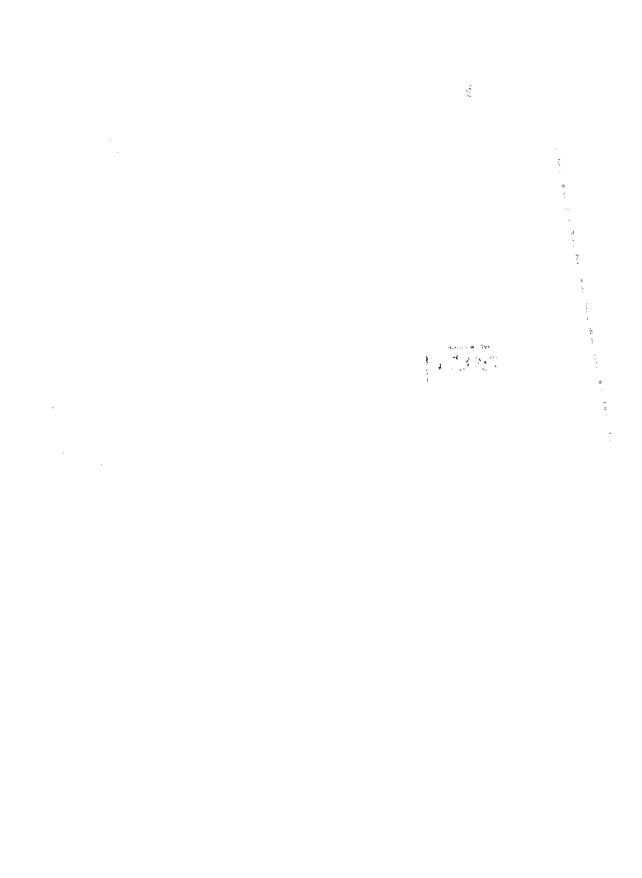
57215

Dr. Maiy Hamdy El-Sayed Assissiant Professor of Cardiology

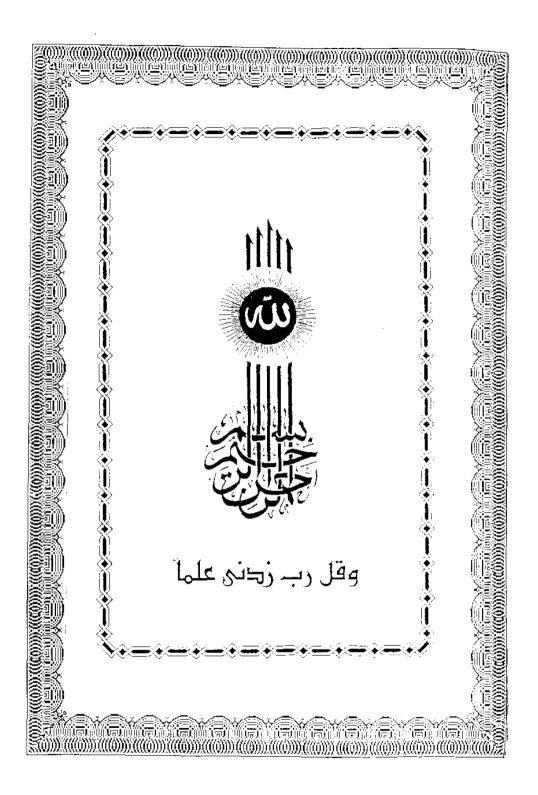
Ain Shams University

Dr. Alyaa Amal Kotby Assisstant Professor of Pediatrics Ain Shams University

> Faculty Of Medicine Ain Shams University 1998









ACKNOWLEDGMENT

Praise be to God for helping me to proceed and complete this work.

It is an honour to express my deep gratitude to Professor Amal Ayoub, Professor of cardiology, Ain Shams University, for giving me great confidence and courage to complete this work.

I would like to express my deep gratitude to Dr. Maiy Hamdy El-Sayed , Assisstant Professor of cardiology, Ain Shams University, for her valuable help and guidance.

I also have the pleasure to express my deep appreciation and thanks to Dr. Alyaa Kotby, Assisstant Proffessor of Pediatrics, Ain Shams University, who was with me in every step during the preparation of this work.



List of Figures

		Page
Fig. (1)	Noninvasive calculation of ventricular dP/dt.	87
Fig. (2)	The response of the left ventricle to increased	
	afterload, preload and contractility.	94
Fig. (3)	Left ventricular response to mitral valve replacement	
	in compensated and decompensated mitral	
	regurgitation.	96
Fig. (4)	The relation between left ventricular ESW stress and	
*21 /63	rate-corrected Vcf, used to assess contractility.	149
Fig. (5)	Classification of the study patients according to the	150
nt= (()	predominant valve lesion.	152
Fig. (6)	Frequency of occurrence of thallium perfusion defects in each valve lesion.	157
Fig. (7)	Improvement in functional classs on follow - up	137
rig. (7)	examination.	166
Fig. (8)	Left and right ventricular ejection fractions (pre-	100
116 (0)	operative, post-operative, and follow-up).	170
Fig. (9)	Left and right ventricular IMP (pre-operative, post-	1,5
1.6.(//	operative, and follow-up)	170
Fig. (10)	The significant predictors of presence of perfusion	•
	defects.	174
Fig. (11)	Calculation of left ventricular IMP using Doppler	
• , ,	echocardiography (patient 55).	189
Fig. (12)	Calculation of right ventricular IMP (patient 55).	190
Fig. (13)	Thallium-201 SPECT of patient number 18, showing	
	fixed anterior, anterolateral and inferolateral defects,	
	and dilated LV.	191
Fig. (14)	M-mode echocardiogram of the same patient as in fig.	
	(13) showing dilated LV.	191
Fig. (15)	Planar anterior veiw of patient number 20 showing	
	increased lung thallium-201 uptake.	192
Fig. (16)	Chest radiogram of the same patient as in fig. (15)	1.00
m: (15)	showing pulmonary venous congestion.	192
Fig. (17)	Thallium-201 SPECT of patient number 24, showing	102
	increased RV thallium-201 uptake.	193

Fig. (18)	Continuous Doppler flow through TV of the same	
Fig. (19)	patient as in fig. (17). Thallium-201 bull's eye of patient number 52 showing a large inferolateral and a smaller anterior	193
	defect with no change between rest and redistribution	
	images.	194
Fig. (20)	Thallium-201 bull's eye of patient number 10	
	showing a large lateral, inferolateral and inferior	
	defect. The defect shows a heterogeneous pattern of	
	thallium-201 uptake.	194
Fig. (21)	Thallium-201 perfusion scan of patient number 42	
	showing a normal perfusion (bull's eye and SPECT).	195
Fig. (22)	Thallium-201 perfusion scan of patient number 19	
	showing a normal perfusion in SPECT views. The	
	bull's eye of the same patient shows a large lateral	
	and a small anterior defect.	195
Fig. (23)	Radionuclide angiographic study of patient number	
	14 showing a LVEF of 54%.	196

List of Tables

		Page	
Table (1)	Guidelines for the diagnosis of initial attacks of rheumatic fever.		
Table (2)	Coronary artery disease in rheumatic fever.		
Table (3)	Derived measurements using radionuclide angiography in valvular regurgitation.		
Table (4)	Clinical characteristics of the patients included in this study.	151	
Table (5)	Echocardiographic dimensions and measurements.	153	
Table (6)	Echocardiographic data: Valve lesions.	154	
Table (7)	Left and Right ventricular indices of myocardial performance.	155	
Table (8)	Frequency of occurrence of perfusion defects in each valve lesion.	156	
Table (9)	Number of perfusion defects in each region, according to diagnosis.	159	
Table (10)	Operative data of the 39 patients who underwent valve replacement surgery.	160	
Table (11)	Post-operative echocardiographic data.	162	
Table (12)	Post-operative left and right ventricular IMP.	163	
Table (13)	The functional classification and degree of functional improvement on follow up.		
Table (14)	Echocardiographic data on follow - up.	167	
Table (15)	Follow-up echo: Doppler data of valves.	168	
Table (16)	Left and right ventricular IMP on follow - up.	169	
Table (17)	Predictors of presence of perfusion defects.	173	
Table (18)	Correlation between left ventricular IMP and defect occurrence.	175	
Table (19)	Correlation between left ventricular contractility and defect occurrence.	175	
Table (20)	Predictors of defect size.	177	
Table (21)	Correlation between defect presence and the post-operative and follow-up data.	178	

Table (22)	Correlation of post-operative and follow-up left ventricular IMP with defect presence.	179
Table (23)	Correlation of left ventricular contractility (post-operative and follow-up) with defect presence.	179
Table (24)	Defect size correlation to post-operative and follow-up data.	180
Table (25)	Correlation between defect presence and functional improvement.	181
Table (26)	Predictors of functional improvement.	182
Table (27)	Correlation between pre-operative echo data and left ventricular ejection fraction on follow-up.	182
Table (28)	Correlations between lung thallium uptake and each of pulmonary venous congestion and functional class.	184
Table (29)	Correlation between prominent right ventricular thallium uptake and right ventricular systolic pressure.	185
Table (30)	Correlation between different methods of ventricular function assessment.	186

List of Abbreviations

Ao ET Aortic ejection time

AoV Aortic valve

AR Aortic regurgitation
ARF Acute rheumatic fever

AS Aortic stenosis
AVD Aortic valve disease
AVR Aortic valve replacement
CAD Coronary artery disease
CT Computed tomography

DVR Double valve replacement ECG Electrocardiogram

EDD End -diastolic diameter
EF Ejection fraction
ESD End-systolic diameter

ESPVR End-systolic pressure-volume relation

ESV End-systolic volume
ESVI End-systolic volume index
ESW stress End-systolic wall stress
FS Fractional shortening

HF Heart failureHS Highly significant

ICT Isovolumic contraction time
IMP Index of myocardial performance

IRT Isovolumic relaxation time
LA Left atrium, left atrial

LVSW stress Left ventricular systolic wall stress

Max PG Maximum pressure gradient MPG Mean pressure gradient MR Mitral regurgitation

MRI Magnetic resonance imaging

MS Mitral stenosis
MV Mitral valve
MVA Mitral valve area
MVD Mitral valve disease

MVP Mitral valve prolapse
MVR Mitral valve replacement

NS Nonsignificant

NYHA
New York Heart Association
PAT
Pulmonary acceleration time
PET
Pulmonary ejection time
RA
Right atrium, right atrial

RF Rheumatic fever

RHD Rheumatic heart disease
RNA Radionuclide angiography
RV Right ventricle, right ventricular
RVSP Right ventricular systolic pressure

S Statistically significant

Tl-201 Thallium-201

TR Tricuspid regurgitation
TS Tricuspid stenosis

Vcf Velocity of circumferential fiber shortening

Vcfc Velocity of circumferential fiber shortening corrected

for heart rate

Contents

	Page
• Introduction	1
• Aim of the work	4
• Review of the literature	5
• Patients and methods	136
• Results	150
• Discussion	197
• Conclusion	216
• Recommendations	217
• Summary	218
• References	221
• Appendix	270
Arabic Summary	

