Clinical Study of the Rate of Transmission of Transmitral "A" Wave to the Left Ventricular Outflow Tract in Left Ventricular Hypertrophy Secondary to Systemic Hypertension by Doppler Echocardiography

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

by

Ayman Asaad Bishay
M.B., B. Ch.

Supervised by

Prof. Dr. Mohsen Rashad
Prof. of Cardiology, Ain Shams University

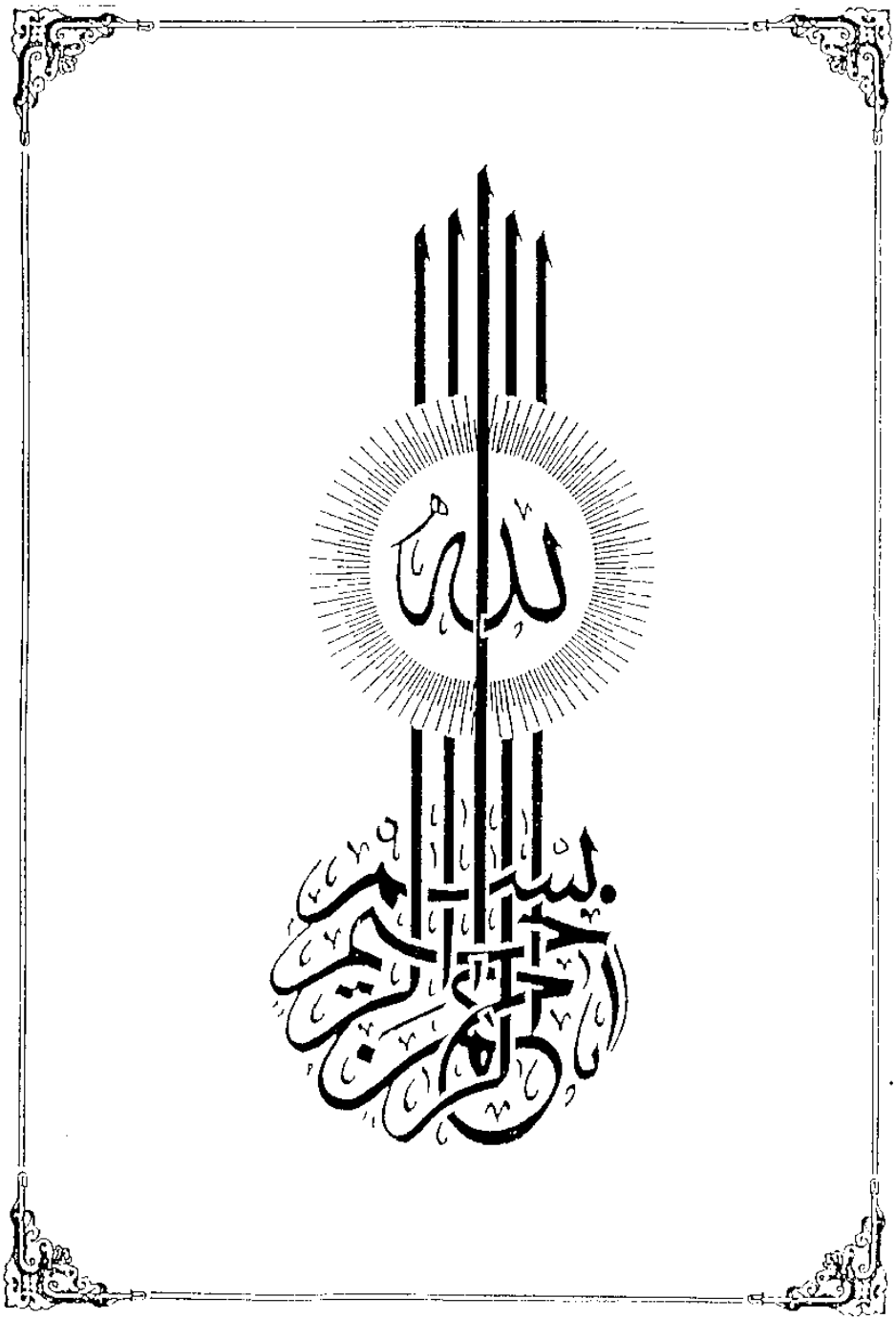
Dr. Osama Abd El Aziz Rifaie
Lecturer of Cardiology, Ain Shams University

Dr. Hanaa El Saaid
Fellow of Cardiology, National Heart Institute

Faculty of Medicine

Ain Shams University

1996



ACKNOWLEDGMENT

ACKNOWLEDGMENT

I would like to express my deep appreciation and gratitude to Professor ***Dr. Mohsen Rashad****, Professor of Cardiology, Ain Shams University, for his kind supervision upon this work.*

I feel very grateful to ***Dr. Osama Abd El Aziz Rifaie*** *Lecturer of Cardiology, Ain Shams University for his great direction all through this work.*

I wish to express my deepest thanks and appreciation to ***Dr. Hanaa Salah El-Said,*** *Fellow of Cardiology, National Heart Institute, for her kind and precious assistance in performing the practical part, and for her continuos advice.*

TABLE OF CONTENTS

INTRODUCTION

INTRODUCTION

Although hypertrophy constitutes a principal compensatory mechanism to sustain systolic emptying of the overloaded ventricle, it may simultaneously interfere with ventricular diastolic properties and impair ventricular filling. Cardiac output depends not only on the ability of the heart to eject blood at each systole, but also on its capacity to fill at each diastole ***(Zile, 1989).***

The importance of assessing left ventricular diastolic function in individual patients has been implied in a number of clinical studies ***(Masuyama et al., 1992).*** Normal diastolic function may be defined as the ability to accommodate an adequate filling volume at low pressure ***(De Maria et al., 1991)***.

Abnormalities of left ventricular diastolic function contribute significantly to symptoms in individuals with a variety of cardiac disorders, including those with normal or near normal systolic function ***(Labovitz and Pearson, 1987)***.

Efforts at assessing diastolic function centered about invasive pressure-volume measurements. Work to characterize ventricular compliance or dispensability

has focused on the study of pressure-volume relations expressed as dV/dP ***(De Maria et al., 1991)***.

In view of limitations of the pressure-volume measurements and because it necessitates invasive procedures which are not possible for routine use, efforts have increasingly been directed toward the assessment of diastolic function by means of evaluation of volumetric filling rates. Left ventricular filling is determined by a complex interaction between passive and active properties of both the atria and the ventricles. It is influenced not only by the myocardial relaxation and passive elastic properties, but also by the preceding left ventricular contraction, elastic recoil of the left ventricle, the atrial driving pressure, and the strength of atrial contraction ***(Labovitz and Pearson, 1987)***.

Evaluation of left ventricular filling patterns by Doppler echocardiography has compared favorably with both angiographic and radionuclide techniques ***(Rokey et al., 1985, Friedman et al., 1986)***.

Doppler echocardiography has contributed significantly to our understanding of intracardiac blood flow. Doppler echocardiographic recordings of normal heart consist primarily of two types of flow pattern i.e. ventricular inflow and ventricular out-flow. Diastolic Doppler flow velocities at the mitral valve have been studied extensively but apart from aortic regurgitation, diastolic flow signals in the left ventricular outflow tract have not well characterized ***(Hatle and Angelsen, 1985)***.

Color flow imaging shows that the transmitral diastolic flow is initially directed towards the left ventricular apex, it then turns around facing the aortic valve and has been referred to as diastolic reverse flow vortex ***(Panayiotou and Byrd, 1990)***.