

"ROLE OF DOPPLER IN EVALUATION OF MITRAL VALVE DISEASES"

THESIS

**SUBMITTED FOR PARTIAL FULFILMENT
FOR MASTER DEGREE OF RADIO DIAGNOSIS**

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1991





TO MY MOTHER

ACKNOWLEDGEMENTS

Tanks to God, who is always helping me in all my life.

I am extremely indebted to Prof. Dr. NAWAL ZAKARIA, Head of the Radiology Department, Ain Shams University, for her continuous support, encouragement and help.

I am also extremely grateful for the continuous advice and assistance of Dr. WAHID TANTAWY, lecturer of Radiodiagnosis, Ain Shams University.

I would like to thank Dr. AHMED GHALEY , Doppler Echo Unit, Cardiology Departement , Ain Shams University.

I would also like to thank all the members of Echocardiography Unit Radiology Department, Ain Shams University, especially Dr. HALA HAFEZ, Dr. ZENATE ELSABAGH and Dr. HANAN ISSA for their help and assistance during examination of our patients.

I would also like to express my deepest thanks for all my professors and colleagues.

Thanks

OMNIA AHMED

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*INTRODUCTION
AND
AIM OF WORK*

INTRODUCTION AND AIM OF WORK

The diagnosis of mitral valve diseases is of great Importance because of their relative common incidence especially with the prevalence of rheumatic heart diseases in our country.

One of the earliest cardiac applications of ultrasound technique was in the diagnosis of rheumatic mitral valve diseases.

There is no doubt that the single-dimensional or M-mode technique aided tremendously in the non invasive diagnosis of patients with suspected rheumatic mitral valve diseases. (Martin, 1985).

The development and refinement of Doppler is a major advance in diagnostic applications of ultrasound in heart diseases. Although the Doppler principle has been used for along time to measure arterial flow, recently, it has been used to assess blood flow within the cardiac chambers and great vessels.

The clinical goal of a Doppler examination is to obtain as much information about the anatomy and

physiology of the patient's heart as is possible by combining imaging and Doppler techniques. Doppler-echo has the advantage that it does not use ionizing radiation, it entails no known risk or discomfort and provides data on beat to beat basis.

(Missri, 1986).

The Aim of this work is to study the Role of Doppler as a non invasive technique in the evaluation of Mitral valve diseases.

In order to fullfill this aim, a short resumé on the anatomy of the mitral valve and the pathology of the diseases affecting it will be first mentioned.

ANATOMY OF MITRAL VALVE

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The mitral valve is a complex, finely coordinated mechanism that requires for its normal performance the functional integrity of six anatomic elements working in delicate harmony. (Fig. 1)

These elements are:- The left atrium, the mitral annulus, the mitral leaflets, the chordae tendinae, the papillary muscles and the underlying left ventricular myocardium.

(Perloff and Roberts, 1972).

The mitral valve consists of continuous veil of tissue inserted around the entire circumference of the mitral orifice. The free margin of the tissue veil shows several indentations. Two are regularly placed and permit the division of the veil into anterior and posterior leaflets. These are the anterolateral and the posteromedial commissures. All the valvular tissue anterior to the commissures becomes the anterior leaflet, and all the valvular tissue posterior to the commissures becomes the posterior mitral leaflet.

The basal portion of this veil is attached to a fibromuscular ring, the annulus.

The mitral valve annulus serves two important functions. First, it is an essential part of the basal attachment or fulcrum of the posterior leaflet. The anterior leaflet is anatomically continuous with the aortic wall, which serves as its fulcrum, and not with the annulus. Secondly, the size of the annulus plays a role in preserving competence of the mitral orifice.

Annular tissue is pliable, permitting sphincteric contraction during left atrial and left ventricular systole. One of the functions of left atrial contraction is the reduction in size of the mitral annulus before the onset of left ventricular systole decreasing its circumference and diminishing the area that the leaflets must bridge. (Kalmanson, 1976).

The mitral valve leaflets:-

The anterior mitral leaflet is a semicircular or triangular structure. The distal third of the

leaflet's surface receives the insertion of the chordae tendinae on its ventricular surface. This is the rough zone of the leaflet. The leaflet surface is clear and membranous proximal to the rough zone. There is a distinct ridge along the superior margin of the rough zone, this being the line of leaflet closure. During valve closure, the rough zone comes into apposition with its counterpart on the posterior leaflet.

The anterior leaflet has a common attachment to the cardiac skeleton with the left coronary cusp and half of the non-coronary cusp of the aortic valve. Thus it forms an important boundary dividing the inflow and outflow tracts of the left ventricle.

The posterior mitral leaflet comprises all leaflet tissue posterior to the two commissural areas. It has a greater attachment to the atrio ventricular annulus than does the anterior leaflet. However, the basal to free-edge length of the anterior leaflet is two or more times that of the posterior, rendering the former more mobile and the latter more supportive.

