

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار





بالرسالة صفحات
لم ترد بالأصل





بعض الوثائق الأصلية تالفة



B11085

**EVALUATION OF A SIMPLE METHOD FOR
ESTIMATION OF THE TRANSAORTIC PEAK
SYSTOLIC PRESSURE GRADIENT IN
PATIENTS WITH AORTIC STENOSIS**

Thesis

Submitted For Partial Fulfillment
of Master Degree of Cardiology

By

OSAMA ABD EL-WADOUD MAHMOUD

M.B., B.Ch.

Supervisors

PROF. DR. MOHAMED AHMED MOSTAFA

Prof. of Medicine & Cardiology

Benha Faculty of Medicine

DR. AHMED ABD EL-MONEIM

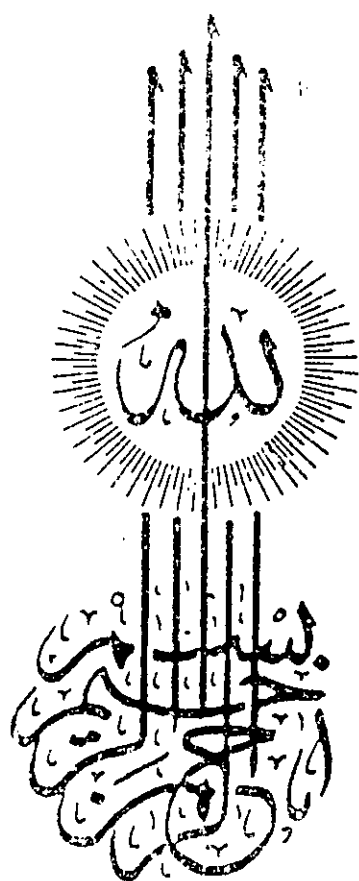
Lecturer of Cardiology

Benha Faculty of Medicine

**BENHA FACULTY OF MEDICINE
ZAGAZIG UNIVER SITY**

1992





قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ
مَكِّي - الله - التَّيْم
الْبَقِيَّة - ٢٢ -

CONTENTS

	Page
* INTRODUCTION AND AIM OF THE WORK.....	1
* REVIEW OF LITERATURE.....	
- Aortic stenosis.....	2
- Normal aortic valve.....	4
- Aortic valve changes with aging.....	7
- Aetiology and pathology of valvular aortic stenosis.....	8
- Natural history of valvular aortic stenosis	22
- Clinical picture.....	26
- Electrocardiographic findings... ..	40
- Chest roentgenogram and cardiac luoroscopy..	48
- Echocardiography.....	51
- Non- invasive assessment of aortic stenosis by echo-doppler.....	59
- Cardiac catheterization in fixed left ventricular out flow tract obstruction.....	73
* MATERIAL AND METHODS.....	86
* RESULTS.....	90
* DISCUSSION.....	117
* SUMMARY.....	124
* CONCLUSION AND RECOMMENDATIONS.....	126
* REFERENCES.....	127
* ARABIC SUMMARY.....	

INTRODUCTION AND AIM OF THE WORK

Valvular aortic stenosis rarely occurs on a rheumatic basis, but is usually either congenital or degenerative in origin.

Left ventricular output is maintained by the presence of left ventricular hypertrophy which sustain a pressure gradient across the aortic valve. Estimation of the peak transaortic systolic pressure gradient, is important to determine line of treatment, which is detected by cardiac catheterization or echo-doppler, which can not be available in all medical centers.

Our study aims to evaluate an easy simple non-invasive method, to estimate the peak transaortic systolic pressure gradient in (mmHg) through study of the 12-lead QRS complexes amplitude in (mm).

AORTIC STENOSIS

Definition :

Aortic stenosis is defined as subtotal obstruction of the left ventricular outflow tract. In order to decreasing frequency, the sites of obstruction are 1) valvular, 2) subvalvular and 3) supra-valvular (Roberts, 1970).

Incidence :

The incidence and prevalence of aortic stenosis have been modified by reinterpretation of pathologic studies, a significant decline in rheumatic fever, and an increase in the life span of the adult population (Roberts, 1970).

About 7 percent of infants and children with clinically identified congenital heart disease will have aortic stenosis in one of its several forms. Approximately 50 percent of these patients will have valvular aortic stenosis (Nugent et al., 1986).

It is not widely appreciated that the congenital bicuspid aortic valve may actually be the most common congenital malformation of the heart. This anomaly is often undetected in early life, and since bicuspid valves may become stenotic with time, it may become of clinical significance only in adult life. At that time a

congenitally deformed valve may be indistinguishable from
one in which the stenosis has been acquired, and for this
reason the true prevalence of the congenital malformation
may be grossly underestimated (Roberts, 1973).

Valvular aortic stenosis occurs far more common in
males than in females, with the sex ratio approximating
1.

THE NORMAL AORTIC VALVE

The semilunar aortic valve is situated at the summit of the outflow tract of the left ventricle, it consists of three major components, annulus, cusps and commissures:

The annulus: it is a nonplanar structure that is part of the fibrous cardiac skeleton and assumes the shape of a triradiate crown.

The cusps: each of the three cusps is a pocket like flap of delicate fibrous tissue that is shaped like a half moon (semilunar) (Olson et al., 1987).

The U shaped convex lower edges of each cusp are attached to and suspended from the root of the aorta. The free edge of each cusp is concave with nodular indentation at the centre of the leaflet "the nodulus Arantii" (Schlant and Silverman, 1986).

The thickened ridge several millimeters below the free edge is the closing edge (Olson et al., 1987).

During valve closure the adjacent cusps contact one another along the surfaces between the free and closing edges (Olson et al., 1987). The free edge, closing edge and nodule of Arantius are present on the ventricular surface of each cusp. In contrast the arterial surface is smooth (Olson et al., 1987).

Behind each cusp the aortic wall bulges outwards forming a pouch-like dilatation known as the sinus of Valsalva (Schlant and Silvenman, 1986).

3- The commissures represent the three sites of separation of the cups from one another (Olson et al., 1987).

During ventricular systole, the cusps are passively thrust upwards away from the centre of the aortic lumen. During ventricular diastole, the cusps fall passively into the lumen of the aorta as they support the column of the blood above. The noduli Arantii meet at the centre and contribute to the support of the leaflets. The geometry of the cusps and the strong fibrous tissue support provide excellent approximation of the leaflets and prevent regurgitation of blood (Schlant and Silverman, 1986). The two anterior cusps are referred to as the right and left coronary cusps, the remaining cusp is the non coronary or posterior cusp (Schlant and Silverman, 1986).

The aortic valve is located centrally at the base of the heart and is tangential to the three other cardiac valves, its plane is oblique with the right posterior side lower than the left anterior side. The commissure between the right and left cusps is located anteriorly and contacts the analogous commissure between the right and left pulmonary cusps. Beneath these two commissures lies the infundibular septum. The commissure between the right

posterior (non coronary) aortic cusps is tangential to the commissure between the anterior and septal tricuspid leaflets. Beneath this aortic commissure is the membranous septum and the bundle of His. The commissure between left and posterior aortic cusps abuts the mid portion of the anterior mitral leaflet and via the infundibular fibrosa, forms direct fibrous continuity between the aortic and mitral valves (Olson et al., 1987).

The normal outflow orifice approximates $2.0 \text{ cm}^2/\text{m}^2$ body surface area, areas of 0.5 to $0.8 \text{ cm}^2/\text{m}^2$ signify moderate obstruction, when area is larger than $0.8 \text{ cm}^2/\text{m}^2$, the obstruction is considered to be mild, when less than $0.5 \text{ cm}^2/\text{m}^2$ it is severe (Friedman, 1984).