THE IMPACT OF RELIEF OF MITRAL STENOSIS BY PERCUTANEOUS BALLOON MITRAL VALVULOPLASTY ON THE DEGREE OF ASSOCIATED AORTIC REGURGE

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بسم الله الرحمن الرحيم

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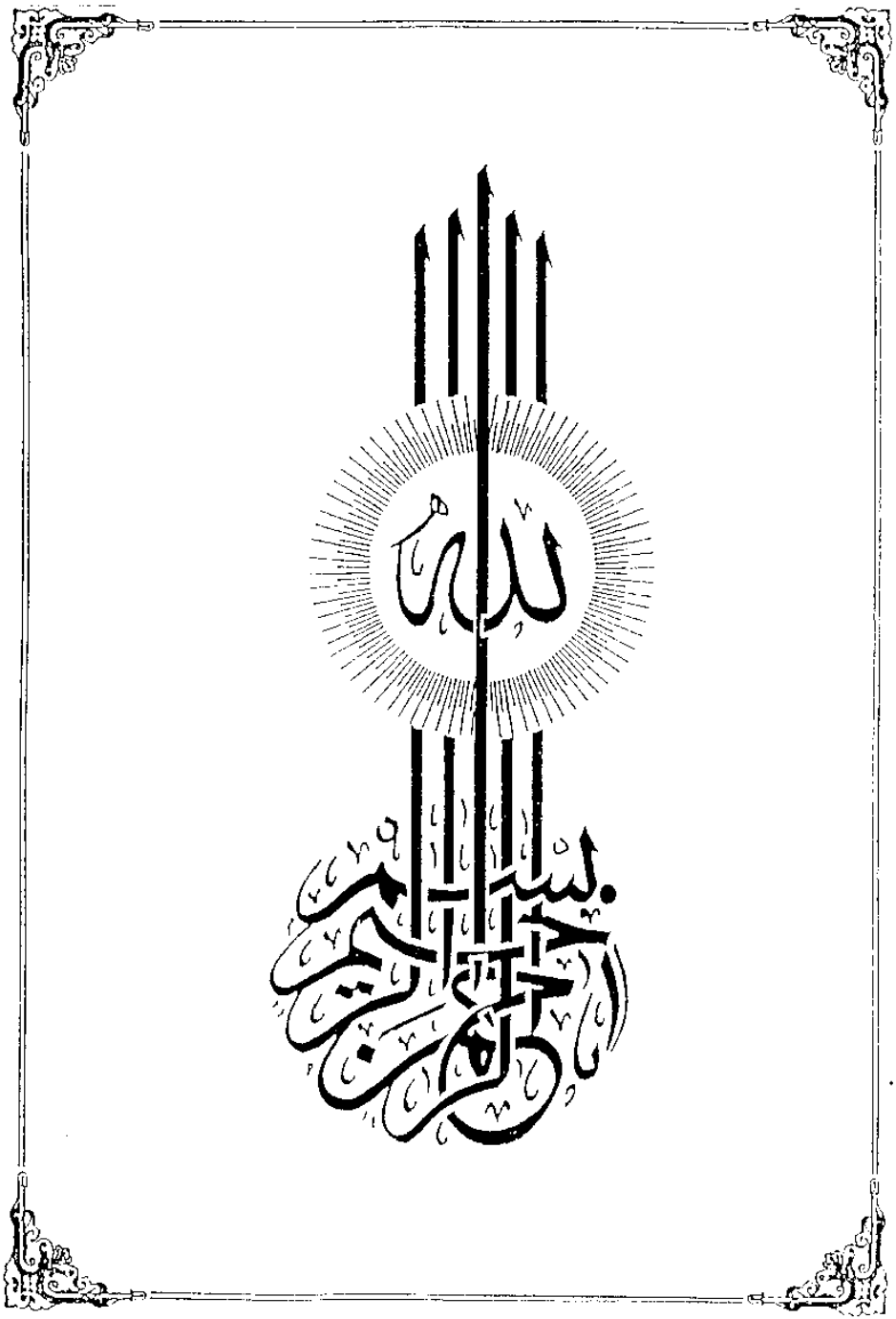

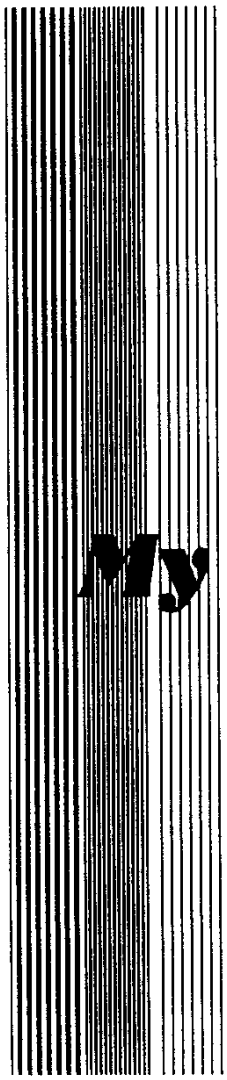

This Work Is Dedicated to

My Father & My Mother

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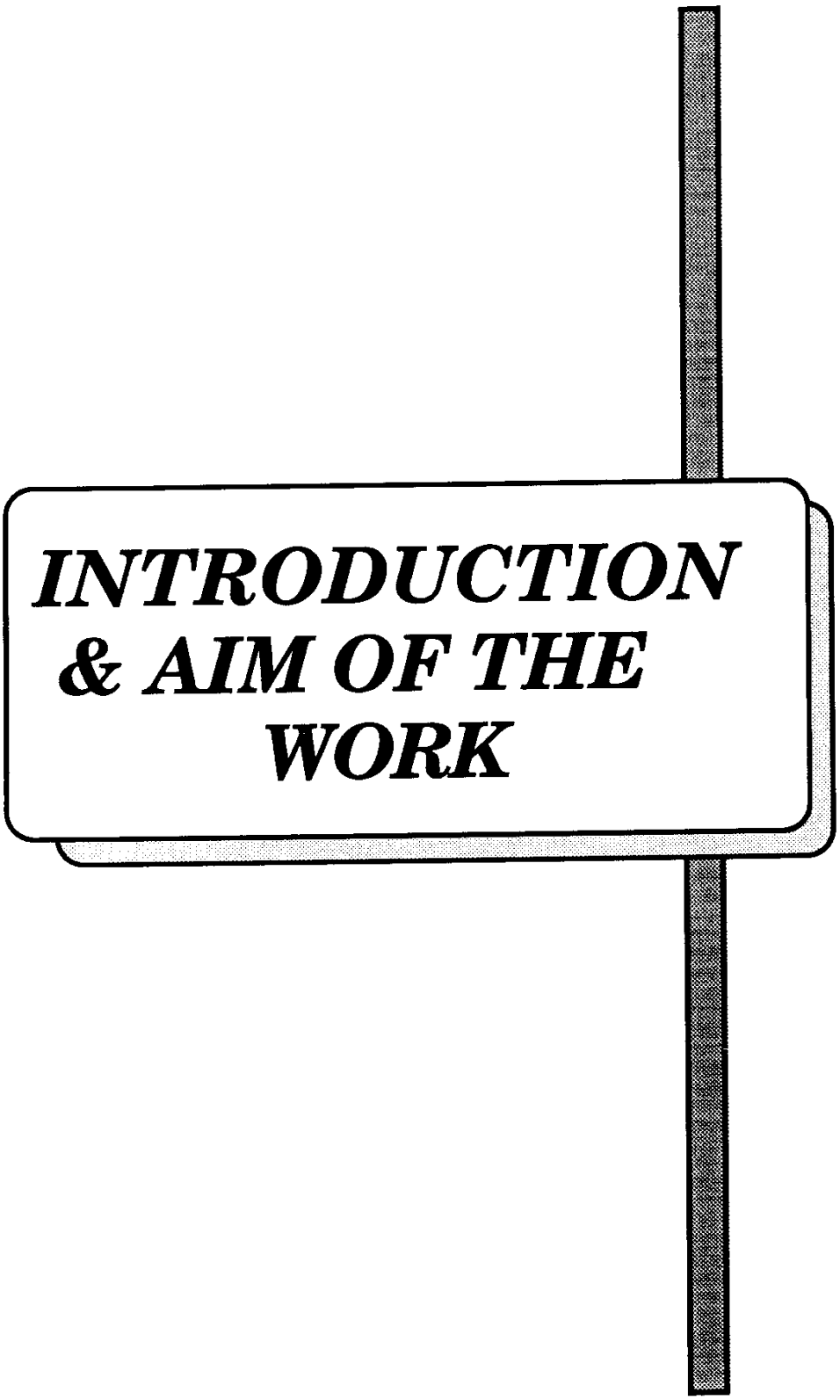


INTRODUCTION AND AIM OF THE WORK

Rheumatic heart disease still constitutes the leading cause of death from heart disease in the 5- to 24-year-old age group in many parts of the world and continues to be a serious public health problem, particularly in some nations of the Third World *(Argarwal, 1981).*

Rheumatic valvular disease is almost always the cause in patients with multivalvular disease requiring cardiac surgery *(Roberts et al., 1973).*

Multivalvular involvement is common, particularly in patients with rheumatic heart disease, and a variety of clinical and hemodynamic syndromes can be produced by different combinations of valvular abnormalities. When the valvular abnormalities are of approximately equal severity, as a general rule, clinical manifestations produced by the more proximal (upstream) of two valvular lesions are more prominent than those produced by the distal lesion, i.e. the mitral valve in patients with combined mitral and aortic valvular disease and the tricuspid valve in patients with combined tricuspid and mitral valvular disease *(Braunwald, 1992).*

This study is one of the studies which address the problems of multivalvular heart disease where it deals with patients

having mitral stenosis and aortic regurgitation.

This combination of significant mitral stenosis and mild to moderate aortic regurgitation is a common combination and according to one study, approximately two-thirds of patients with severe mitral stenosis have an early blowing diastolic murmur along the left sternal border with a normal pulse pressure; in 90 per cent of these patients the murmur is due to aortic regurgitation and is usually of little clinicl importance *(Braunwald, 1992).*

However, approximately 10 per cent of patients with mitral stenosis have severe rheumatic aortic regurgitation which can usually be recognized by the peripheral signs of a widened pulse pressure, left ventricular dilatation and increased wall motion on echocardiography, and signs of left ventricular enlargement on radiological and electro-cardiographic examinations *(Segal et al., 1956).*

Furthermore, some studies suggest that some degree of mitral involvement, albeit slight in some cases, occurs in virtually every patient with rheumatic valvular disease *(Roberts and Virmani, 1978).*

Terzaki et al. (1970) have reported that, the most frequently associated multivalvular lesions are the combination of aortic and mitral disease. They found that the

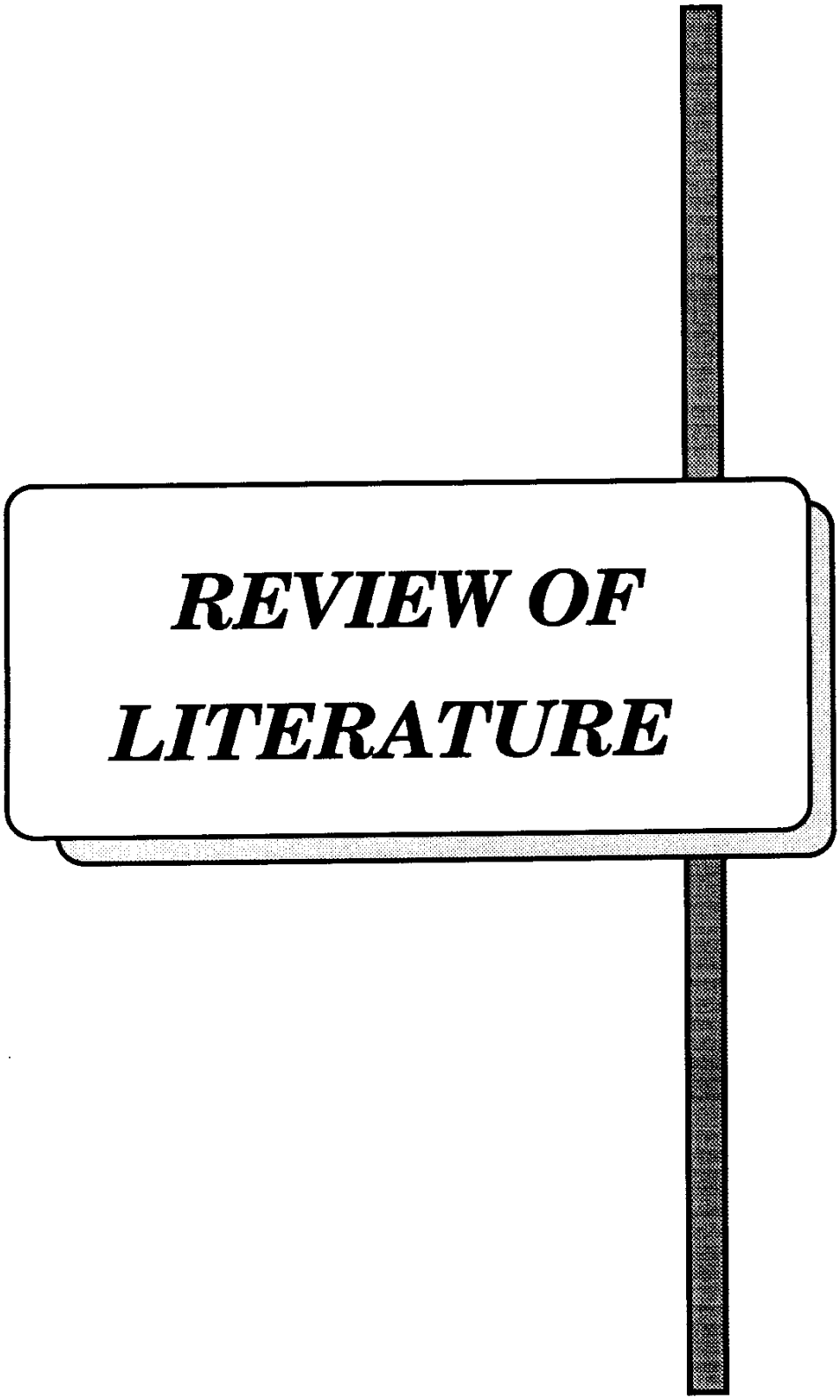
diastolic blood pressure and the pulse pressure were unreliable indices for assessing the severity of associated aortic regurgitation in patients with significant mitral stenosis with mild to severe aortic regurgitation. Also, the central aortic pressure was within normal limits in most patients with mild aortic incompetence, but was less than normal in the patients with more severe forms of the disease. The central aortic pulse pressure was widened in the majority of cases, but could not be used as a factor to differentiate between mild and severe aortic incompetence in the study of *Terzaki et al. (1970).*

On clinical examination of patients with obvious aortic regurgitation, errors may be made in that mitral stenosis may be missed or, conversely, may be falsely diagnosed. An opening snap and accentuated first heart sound in a patient with aortic regurgitation should suggest the possibility of mitral valvular disease. On the other hand, an Austin Flint murmur is often inappropriately considered to be the diastolic rumbling murmur of mitral stenosis. These two murmurs may be distinguished at the bedside by means of amyl nitrite inhalation, which diminishes the Austin Flint murmur but augments the murmur of mitral stenosis. However echocardiography, particularly pulsed Doppler echo-cardiography, is of decisive value in the detection of both lesions.

Thus in patients with multivalvular disease,the relative severity of each lesion may be difficult to estimate by clinical examination and noninvasive techniques, because one lesion may mask the manifestations of the other. For this reason, patients suspected of multivalvular involvement and in whom surgical treatment is under consideration should undergo (in addition to careful clinical examination and noninvasive work-up, with emphasis on two-dimensional and Doppler echo-cardiography), right-and left-sided cardiac catheterization and angiography *(Braunwald,1992).*

AIM OF THE WORK :

The aim of this study is to determine the effect of relief of mitral stenosis by percutaneous balloon mitral valvuloplasty on the degree of associated aortic regurgitation and on end diastolic diameter of the left ventricle in patients with mitral stenosis and mild to moderate degree of aortic regurgitation.



CHAPTER I
THE EFFECT OF RELIEF OF MITRAL STENOSIS ON THE SEVERITY OF ASSOCIATED AORTIC REGURGITATION

It has been postulated that patients with combined mitral stenosis and aortic regurgitation have a "protected" left ventricle and may not tolerate correction of mitral stenosis because of the resultant increase in inflow into an already volume-overloaded left ventricle. Furthermore, it has been suggested that relief of mitral stenosis may increase the amount of aortic regurgitation, which may prove to be an intolerable burden for the left ventricle *(Runco et al., 1965).*

However, this belief may stemmed from the study done by *Runco et al. (1965)* who have investigated twenty-five patients with tight mitral stenosis proven by catheterization prior to closed mitral commissurotomy. Preoperative aortic root angiography performed in twenty-one patients with basal diastolic murmur of aortic regurgitation has demonstrated one to three plus aortic regurgitation (zero to four plus scale). Catheterization or clinical evaluation postoperatively indicated that all patients had successful relief of mitral valve obstruction. Aortic root angiography repeated two weeks to 20 months after surgery in nine patients showed some increase in aortic regurgitation in six, three of whom had no further increase on a third aortic root angiography 20 to 30 months later. The four

additional patients without clinical indications for preoperative aortic angiography developed auscultatory "unmasked" aortic regurgitation following surgery which was confirmed angiographically.

However,the study of *Runco et al. (1965)* showing progressive increase in the degree of aortic regurgitation after relief of mitral stenosis in some patients with significant mitral stenosis and mild to moderate aortic regurgitation has certain limitations mentioned by *Sharaf (1992)* e.g.

- The number of patients studied after closed mitral commissurotomy invasively was nine patients which is a small number, and the reason for including these nine patients for a repeat cardiac catheterization was not clear.
- The long interval between the preoperative study and the postoperative one which was up to 20 months raises the question wether the some increase in aortic regurgitation was due to the effect of relief of mitral stenosis or due to natural progression of the severity of aortic regurgitation, which is a well known phenomenon *(Morrow et al., 1965).*

Recently *Chen et al. (1993)* performed a study to compare the results of percutaneous balloon mitral valvuloplasty in 53 patients with significant mitral stenosis and mild to moderate aortic regurgitation and 112 patients with significant mitral stenosis without associated aortic regurgitation.