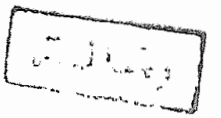
SERUM MYOGLOBIN AS A RELIABLE TEST FOR EARLY DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION AND EARLY DETECTION OF REPERFUSION AFTER THROMBOLYTIC THERAPY

THESIS

Submitted In Partial Fulfillment For The Master Degree Of Cardiology



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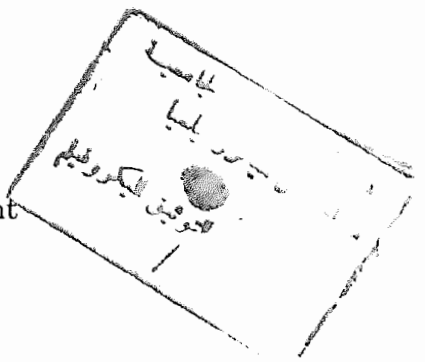
SPASMODIC FLAT FOOT

ESSAY



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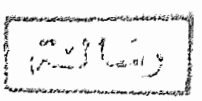

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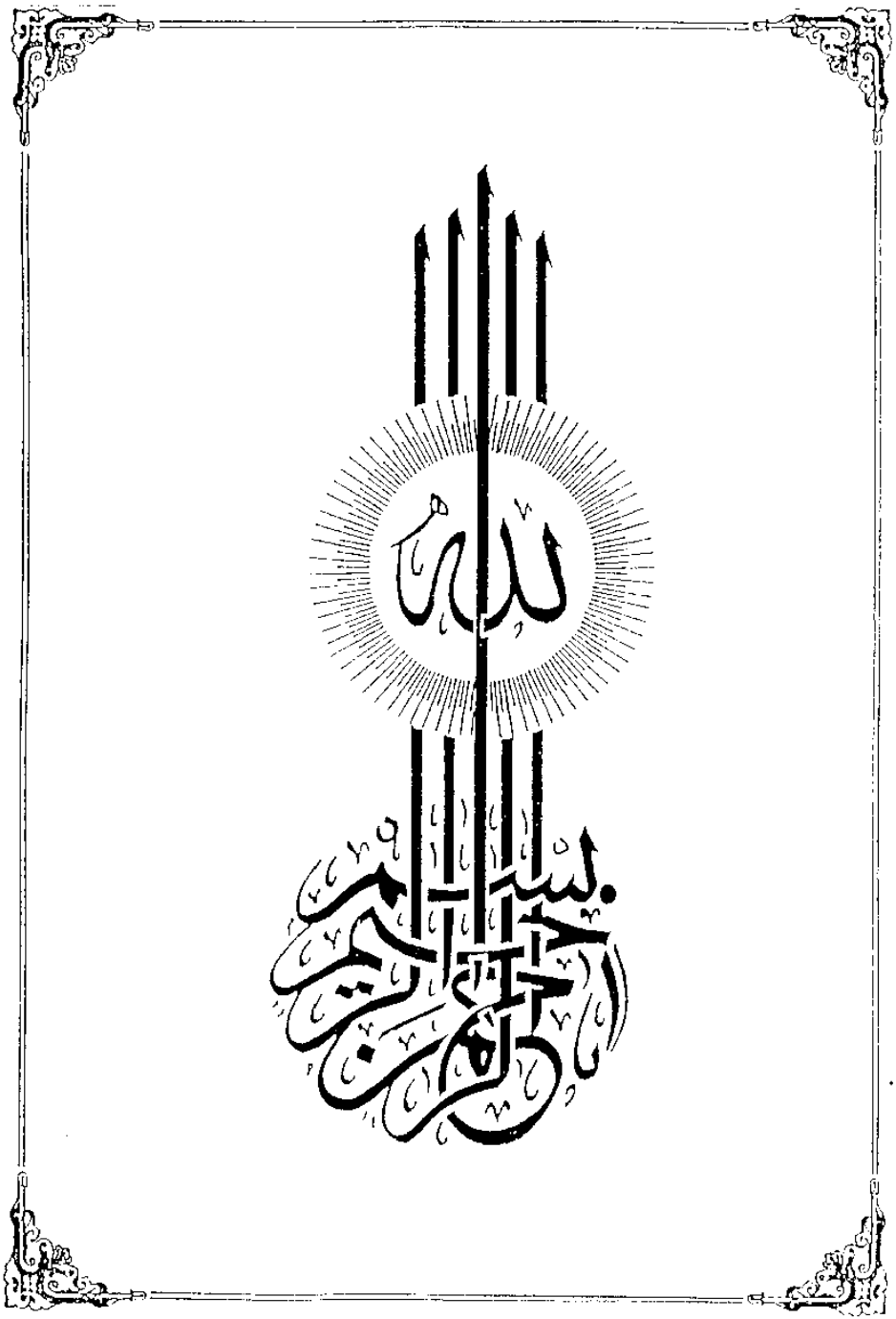

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CONTENTS

Introduction

Introduction

Body weight is normally transmitted through two columns, with the medial border of each foot raised from the ground like the arch of a bridge. The height of the arch may be normally low or normally high; but the term **flat foot** implies the apex of the arch had collapsed inward.

Many people with flat foot can walk as comfortably and as easily as others who have so called normal arches. Black people have flat foot at an early age but later usually develop strong normal arches.

Perhaps one out of a thousand people with flat foot will have pain from the* condition because of congenital or acquired abnormalities (DuVries, 1967).

The term **Spasmodic flat foot** is a misnomer as the foot is not flat, nor the disorder spasmodic; but the foot is everted and the muscles are in spasm (Apley, 1978).

Chapter I
Anatomical Considerations

ANTOMICAL CONSIDERATIONS

The arched construction of the foot :

The plantegrade foot is constructed from the tarsal and metatarsal bones and phalanges arranged to form medial and lateral longitudinal arches as well as tarsal and metatarsal transverse arches.

The flat short outer arch is formed by the lateral two metatarsal bones, the cuboid and the heel bone. The key stone of this arch is the cuboid. Acton (1967).

The medial longitudinal arch which is longer and more arched is formed by the medial three metatarsals, the cuneiforms, the navicular, the talus and the heel bone Last (1969); Paturet (1951).

Marshal 1946 described an intermediate longitudinal arch having the sustenstaculum tali as the key stone.

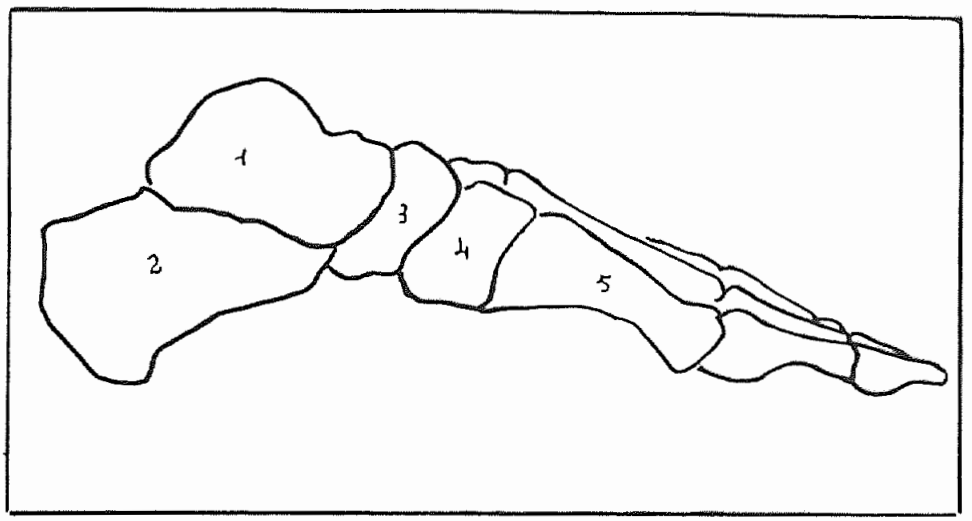
Recent X ray pictures of sliced sagittal sections of the talus carried out by Rigaud (1962) showed stress lines diverging from the trochlear surface of the talus to the sustentaculum tali and head of talus which points out that :

1. The talus is the key stone of the medial longitudinal arch.
2. The sustentaculum tali is a constituent of the posterior pillar of the medial longitudinal arch.

The Skeleton of the foot from

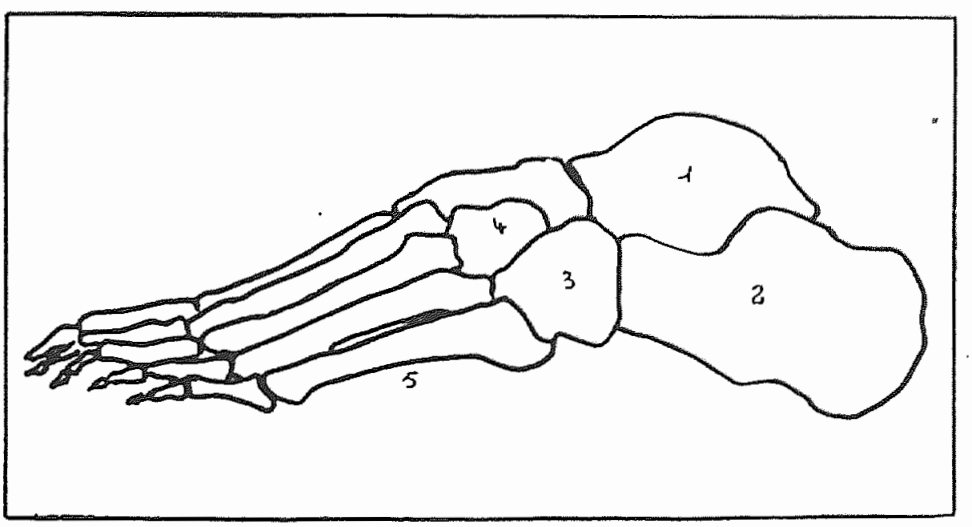
(Gray, 1973)

Medial Aspect



1- Talus 2 Calcanceum 3- Navicular 4 Medial cuneiform 5 1st metatarsal

Lateral Aspect



1- Tauls 2- Calcaneum 3 Cuboid 4- Lateral cuneiform 5 Metatarsus

The transverse arch is in reality only half an arch, being completed as an arch by that of the other foot. It consists of the bases of the five metatarsal bones and the adjacent cuboid and cuneiforms. The heads of the five metatarsal bones lie flat upon the ground and can scarcely be described as taking part in the transverse arch, thought the first and fifth heads bear more weight than the others (Last, 1979).

ARCH SUPPORT

A. The Muscles and Ligaments :

Three views have been pointed as regards the primary supporters of the basic structures of the arch.

i) It is the muscles that are the primary element for arch support. Gottlieb 1932 considered the short muscles as the all important element to antagonize the arch flattening effect of the triceps surae muscle. A. Keith 1929, Anapol 1929, Kaplan 1935, Gray 1958, Last 1966, Acton 1967, considered the long muscles as the primary element.

ii) It is the combined effect of muscles and ligaments that support the arch.

Harris and Beath 1948, considered that both the passive mechanism (bones and ligaments) and the active mechanism (muscles) are responsible for arch support and that these are reciprocal. They however claimed that the greater strength and stability is attributed to the passive rather than the active mechanism.

W. Jones 1949 pointed out that the plantar aponeurosis and the plantar tarsal ligaments are the primary factors assisted by the short plantar muscles.

iii) It is the ligaments only that are important for arch support. R. Jones 1941, found that by clinical assessment on living subject, the foot maintains comfortably its arch under loads mounting to twice the body weight without evident muscles activity.

More recently the electromyographtic studies of Basmajian and Stecko, 1963 - Man and Inman 1964, revealed that the long and short muscles of the foot are completely inactive (except the soleus) during the static posture of standing at rest and therefore the ligaments are the only supporters of the arch under such condition.

B. The foot as a support :

Since the foot transmits weights to the ground mostly through the heel and ball, and receives weight from above to any intermediate pint in its length it can presumably behave either as an arch (truss) or as a beam (Hicks, 1955).

A truss is a mechanical situation in which the ends can become furthur apart when weight is applied vertically.

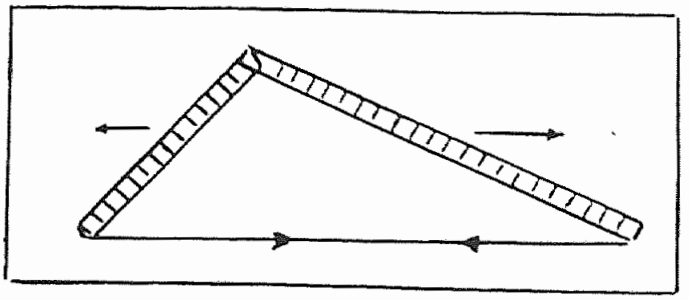
While a beam is a mechanical situation in which the ends are prevented from being thrust apart.

Hicks said that the foot consists of five independent weight bearing units. Each unit supports weight by acting variously as a beam and a truss. He also found that the foot bears twice the body weight by the truss mechanism and three times the body weight by the beam mechanism.

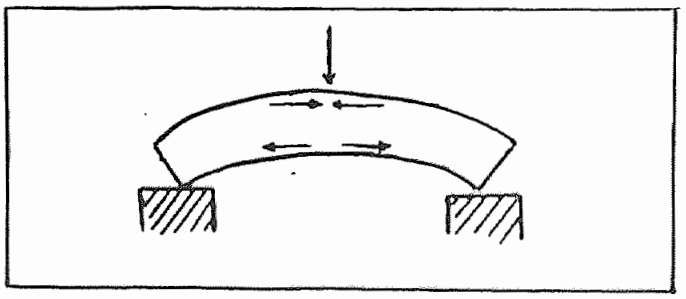
The foot as a support from

(Hick, 1955)

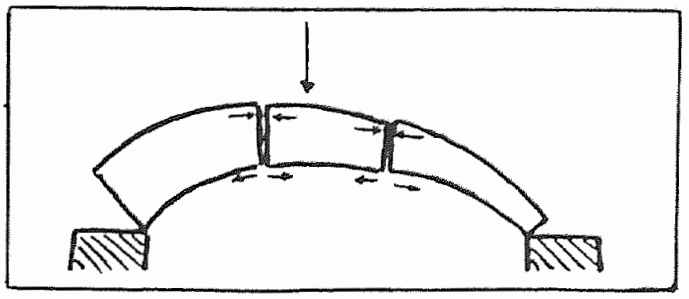
The truss mechanism



Curved beam



Several pieces behaving as a beam



In the low arch position of flat standing at rest or in the mid stance phase of walking, both the truss and beam mechanisms work together in proportions equal 2 : 1 respectively.

In toe standing position, or in the push - off phase of walking, the extended metatarso-phalangeal joints increase the tension in the plantar aponeurosis, which pulls on the foot into the ray flexed high arched position "Windlass mechanism". In this position the truss is the only mechanism acting to meet the high compression forces and to increase the solidity of the arch for leverage. The beam mechanism is completely relegated or even reversed as all the components of the arch increase their curvatures.

Zitslsperger (1960) pointed out that the wedging of bones at the top of the arch forms a self locking mechanism under high compression loads that increase the stability of the arch.

It could be concluded that the stability of the arch of the foot is maintained by the tight and compact arrangement of its bondy constituents bound together by thick ligaments.