ROLE OF MAGNETIC RESONANCE IMAGING IN INJURIES OF ANKLE JOINT

ESSAY

Submitted In Partial Fulfilment For the Degree of
M.Sc.
In Radiodiagnosis

By

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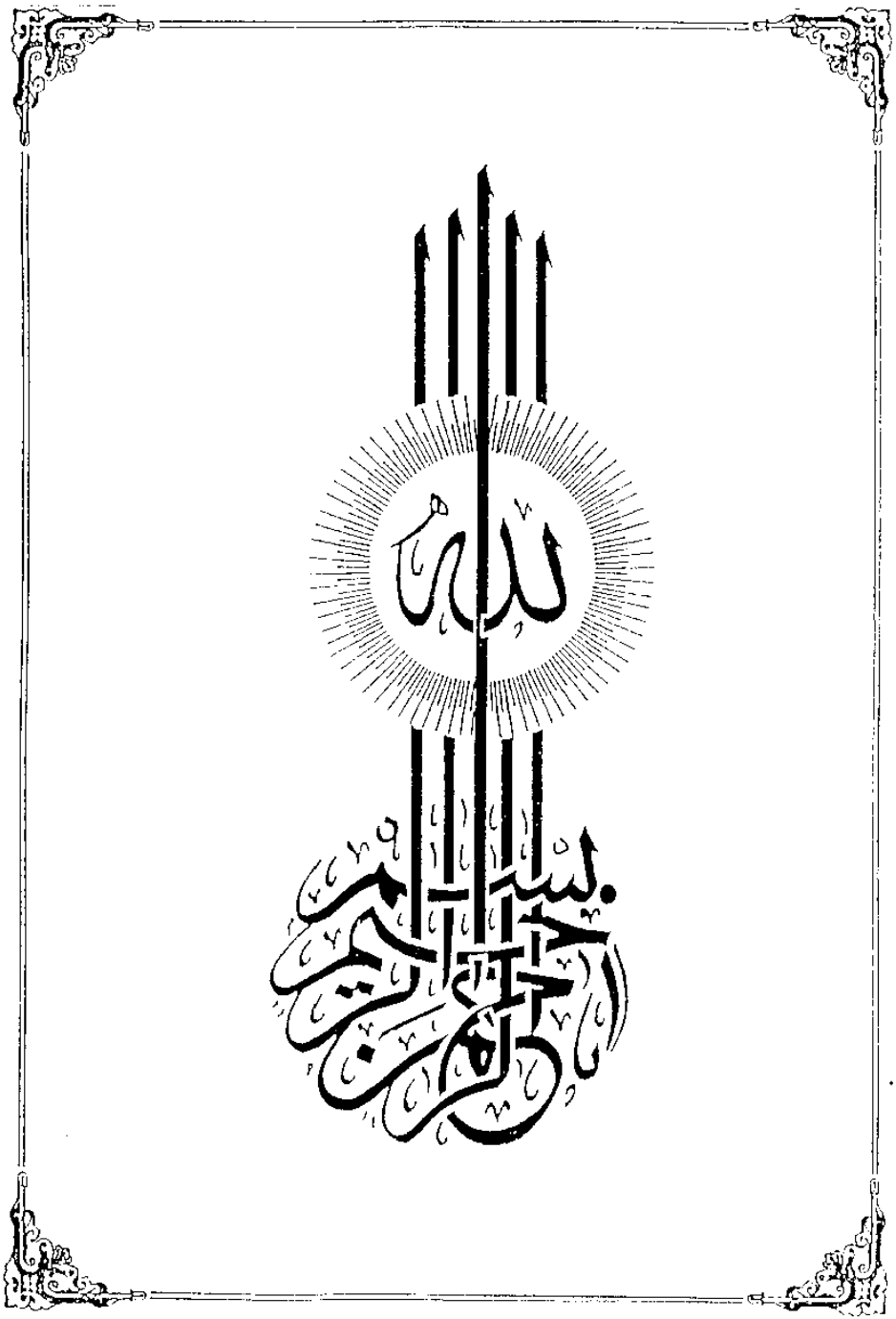
TO MY PARENTS



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CONTENTS

LIST OF ABBREVIATIONS

T.	= Tibia
TAL	= Talus
CA	= Calcaneus
PF	= Posterior facet of subtalar joint.
EHL	= Extensor digitorum longus tendon.
FHL	= Flwxor hallucis longus tendon.
PTA	= Posterior tibial artery
AT	= Achilles tendon
F	= Preachilles fat pad
ST	= Sustentaculum Tali
FL	= fibula
DL	= Deltoid ligament
TP	= tibialis posterior tendon
FDL	= Flexor digitorum longus tendon
AHL	= Abductor hallucis longus muscle.
FDB/QP	= Flexor digitorum brevis muscle, Quadratus plantae muscle.
ADV	= Abductor digiti V muscle.
PB	= Peroneus brevis tendon
PL	= Peroneus longus tendon
MM	= Medial malleolus
IOL	= Interosseous ligament
LM	= Lateral malleolus
PTFL	= Posterior tibiofibular ligament
ATFL	= Anterior tibiofibular ligament
PNVB	= Posterior neurovascular bundle (posterior tibial artery, veins, and tibial nerve).
ANVB	= Anterior neurovascular bundle (Anterior tibial artery, veins, and deep peroneal nerve).
FR	= Flexor retinuculum.
TA	= Tibiali, anterior tendon
PT	= Peroneus tertius tendon

BIBLIOGRAPHY OF LISTED FIGURES

INTRODUCTION
AND AIM OF THE WORK

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The ankle is one of the most frequently injured joints, accounting for 10% of all Emergency Department visits. Inversion injuries are one of the most common ankle lesions, often involving the ligamentous structures of the lateral aspect of the ankle.

Assessment of the extent of injury has classically relied on clinical evaluation, plain radiographs (including stress views), and in some acute situations, ankle arthrography and/or peroneal tenography.

Radionuclide bone scan and less commonly CT may be used. In the past few years, magnetic resonance imaging (MRI) has revolutionized the imaging approach to a broad range of musculoskeletal disorders. In many instances, it has superseded CT by virtue of its direct multiplanar imaging capability and superior contrast resolution for soft tissues that provided excellent delineation of ligaments, tendons, muscles, fat, synovium, fibrocartilage, hyaline cartilage, cortical bone and bone marrow.

The aim of this work is to study the value of the MRI in acute and chronic foot and ankle problems.

ANATOMY OF ANKLE JOINT

ANATOMY

The ankle joint is a synovial joint of hinge variety, but its movements are not quite as those of a simple hinge, as the axis of rotation changes between the extremes of plantar flexion and dorsiflexion *[Last, 1978]*.

The lower end of the tibia and its projecting medial malleolus, the fibular malleolus and the inferior transverse tibiofibular ligament form a mortise, the moving component projecting into the mortise is the talus, which fits very tightly *[Gray, 1973]*.

Articular Surfaces:

They are recovered by hyaline cartilage and are divided into weight bearing surfaces and supporting sufaces. The weight bearing surfaces are the trochlear surface of the talus and the inferior facet of the tibia which is called the tibial plafond. The supporting surfaces are those of the medial and lateral malleoli which grip the sides of the talus *[Gray,1973]*.

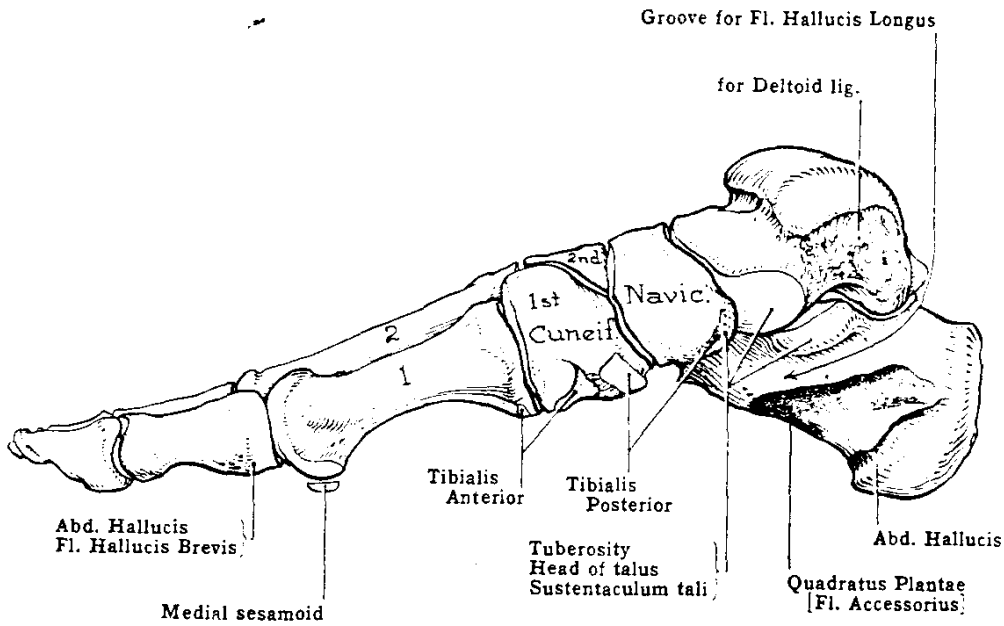

Fig. 1a: *Bones of the foot, Medial aspect.*

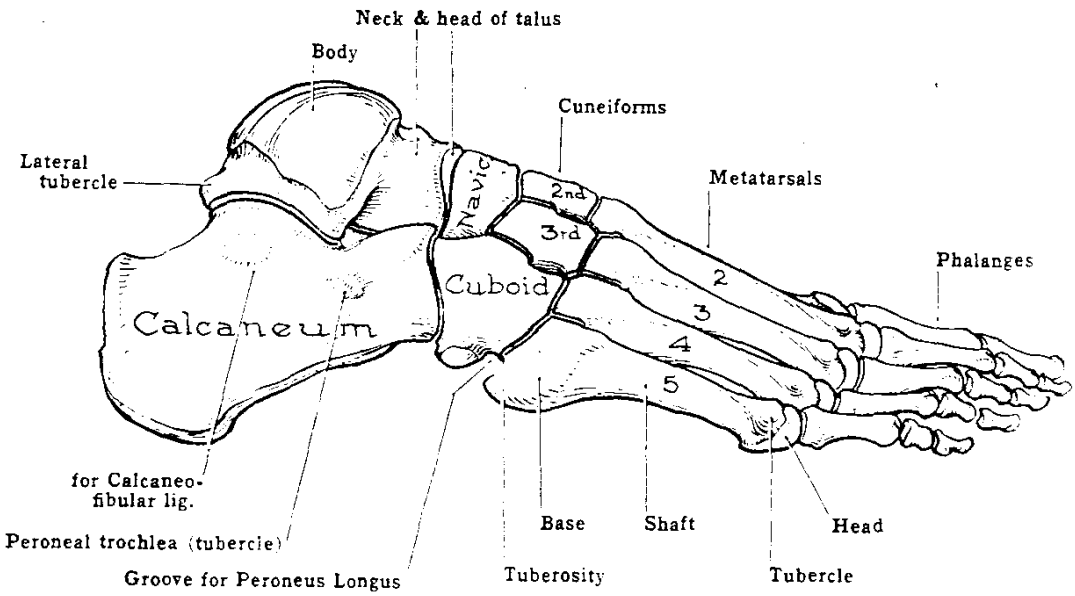

Fig. 1b: *Bones of the foot, Lateral aspect.*

The talus is composed of three parts (Fig. 1), the head, the neck and the body (trochlea). The talus has no muscle attachment and is covered by articular cartilage on most of its surface. The body (trochlea) is wider anteriorly than posteriorly by about twenty five per cent *[Grath, 1960]*.

The articular surface of the talar trochlea is convex from front to back and from side to side, it continues medially and laterally to form facets that articulate with the malleoli. The medial surface of the talus has its anterior and upper part of a triangular articular facet which articulates with the medial malleolus. Below the posterior part of this facet there is a surface for the attachment of the deep posterior talotibial ligament *[Gray, 1973]*.

The articular surface on the lateral side of the talus is triangular and concave from above downwards. It is in contact with the articular facet of the medial surface of the lateral malleolus. This facet is separated from the tibia by the line of inferior tibiofibular joint paded by synovial fluid. Posteriorly

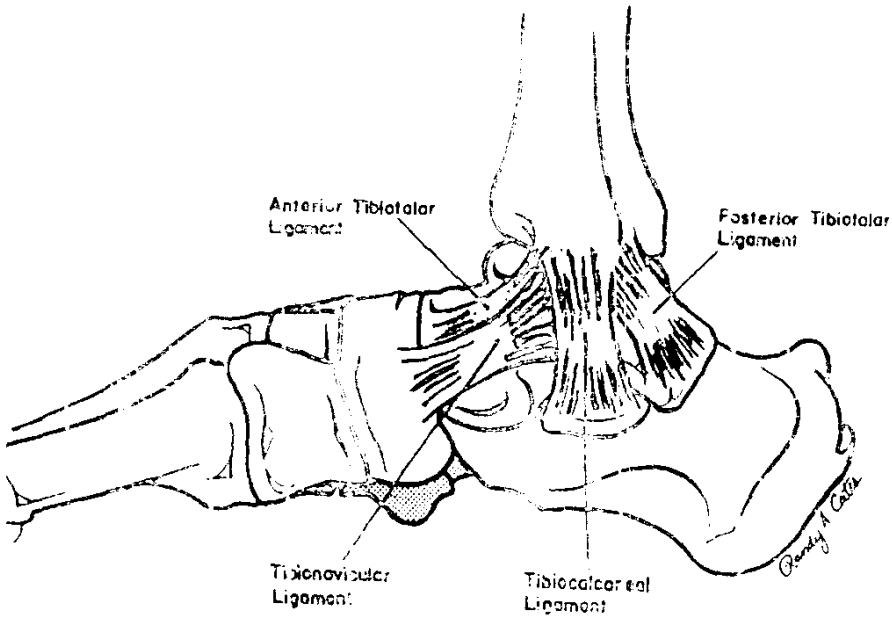

Fig. 2: *Medial ligamentous complex of the ankle (deltoid ligament).*