ROLE OF MRI IN THE DIAGNOSIS OF NON-TRAUMATIC LESIONS OF KNEE JOINT

Thesis

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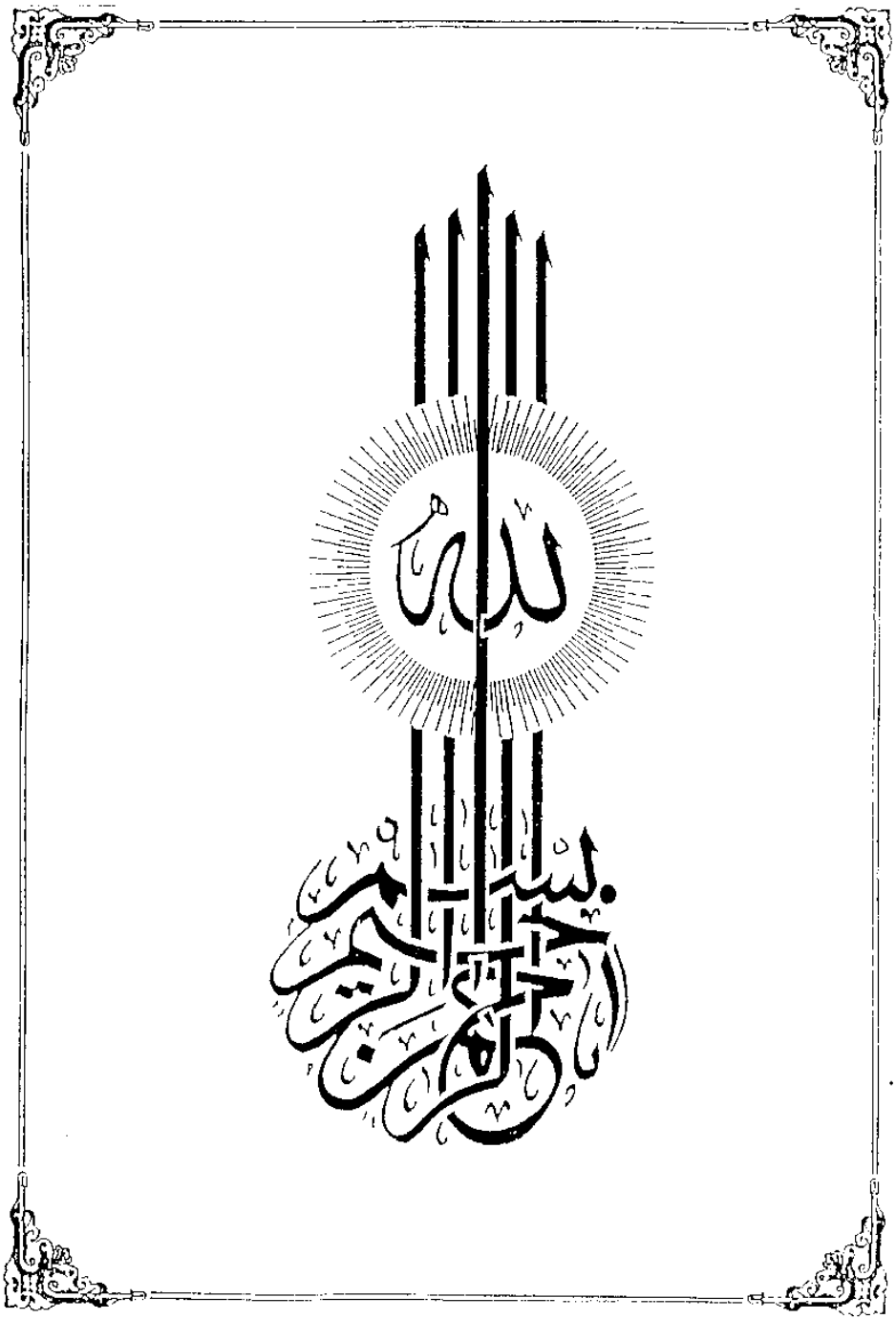
بسم الله الرحمن الرحيم

THANKS TO GOD

Source of All Facts And Sience



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Introduction and Aim of Work

MRI has a dramatic impact in the involvment of disorder affecting the musculoskeletal system it is an ideal technique for evaluating rheumatological disease and its inherent contrast sensitivity, multiplanar capability, lack of ionizid radaition and acceptibility to patient render it more practical and unsurpassed as unimaging technique (Branke SK et al., 1991) the first reaserches published examples of normal and abnormal images of the knee by (kean - et al 1983). MR imaging has fueled an explution of interest on MR imaging of the knee (an - opin - rodial 1992) MRI has established itself as the gold standard non invasive imaging of knee (magen - reason - 1992) MRI is the only modality with which articular cartilage can be directly visualised and better indicating great promise for evaluation of arthritis and even better respons to therapy (burk et al 1986).

MRI shows a great value in diagnosis of joint diseases either of traumatic or non traumatic causes.

We aimed in that work to study the value of MRI in perfect good diagnosis & excellent visualization of some non-traumatic knee joint diseases.

Anatomy of The Knee Joint

ANATOMY OF THE KNEE JOINT

The knee joint is a synovial joint between femur and tibia. It is generally considered to be a modified hinge joint which permits very free extension and flexion . Extension is for propulsion, and flexion used prior to this and also to absorb the shock (by quadriceps) in landing. In addition the flexed knee can rotate, as in change of direction at speed. This active rotation is a matter of choice, and is not to be confused with the passive and inevitable rotation that occurs in straightening the knee in the screw-home mechanism. During all these movements the knee is adapted to be weight bearing in any position. Last 1973.

Bony Contours and articular surfaces:

There are three articulations at the knee joint. Tow, medial and lateral between the condyles of the femur and the menisci and condyles of the tibia; the third is the intermediate articulation between the patella and the femur.

The femur has two condyles separated posteriorly by a deep notch, but fusing anteriorly into a trochlear groove for articulation with the patella. The lateral ridge of the trochlear groove is very prominent. The femoral condyles are convex from side to side and from before backwards, but the curvature is greatly accentuated posteriorly the curve of the femoral condyles is cam-shaped when viewed in lateral profile.

The Fibrous Capsule :

It is very complicated structure, for in part it is deficient and in part it is replaced by strong expansions from the tendons of the muscles which surround the joint.

On the femur the capsule adheres below the epiphyseal line down to the articular margin except in two places. At the back it is attached to the intercondylar ridge at the lower limit of the popliteal surface and on the lateral condyle it encloses the pit for the popliteus tindon.

On the tibia the capsule is attached around the margins of the platiau except in two places. Posteriorly, it is attached to the ridge between the condyles at the lower end of the groove for the posterior cruciate ligament while laterally, the capsule is not attached to the tibia but is prolonged dowen over the popliteus tendon to the styloid process of the head of the fibula.

The edges of this prolongation are the arcuate ligament posteriorly and the short external lateral ligament anteriorly . The arcuate ligament is the edge of the capsule that arches down from the lateral meniscus to the styloid process of the fibula. The superficial fibres of the popliteus muscle are attached to it.

Infrapatellar fold:

It is formed when the capsule is invaginated with the synovial membrane by a pad, of fat whose herniation occurs into the joint.

The Synovial Membrance of the Knee Joint :

It is a large and complicated sac. In general it is attached to the 3bones (Femur, tibia and patella) following closely the edges of the articular cartilages as in most joints, but, in order that the synovial membrane does not.

When the knee is flexed, it must be lax and redundant when the joint is extended. This is why istead of passing the only from the femuer to the paetella and tibia, it rises above the patella for about the patella, this part of the synovial membrane is called the suprapatellar bursa. [LAST, R.J. 1981].

Below the patella the synovial membrane is separated from the patellar ligament by a mass of fat called the infrapatellar pad of fat. The synovial membrane of knee is characterised by having many free tags filled with fat which projects into the joints cavity, they may occasionally get pinched [LAST, R.J. 1981] (Fig. 1).

The Relation Between the Cruciate Ligaments and synovial Membrane :

The relation is complex. the 3 cruciate ligaments have been pushed to the inside of the joint from behind carrying the synovial membrane with them i.e. the anterior cruciate ligament is covered on its anterior surface while the posterior cruciate ligament is coverd on its posterior surface. Indeed, the cruciate ligaments develop in a partition which divides the knee at first into two separate cavities each prossesing its synovial membrane, later this membrane disappears in

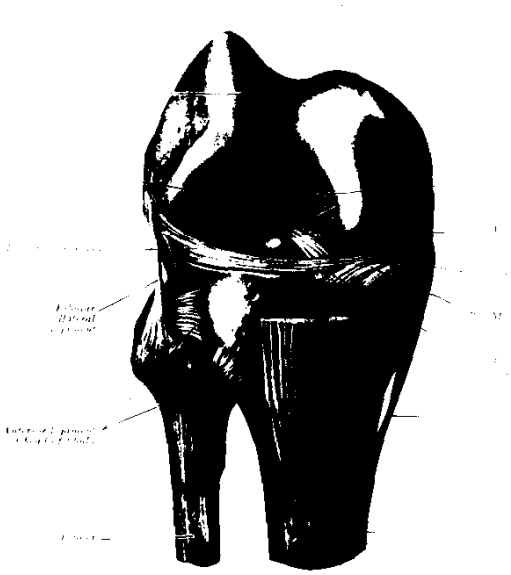

Figure 1, The hight knee, Dissected fot the front

(After Grey's, Anatomy 1973)