RADIOLOGICAL MANIFESTATIONS OF DISLOCATION OF THE HIP JOINT

THESIS

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By

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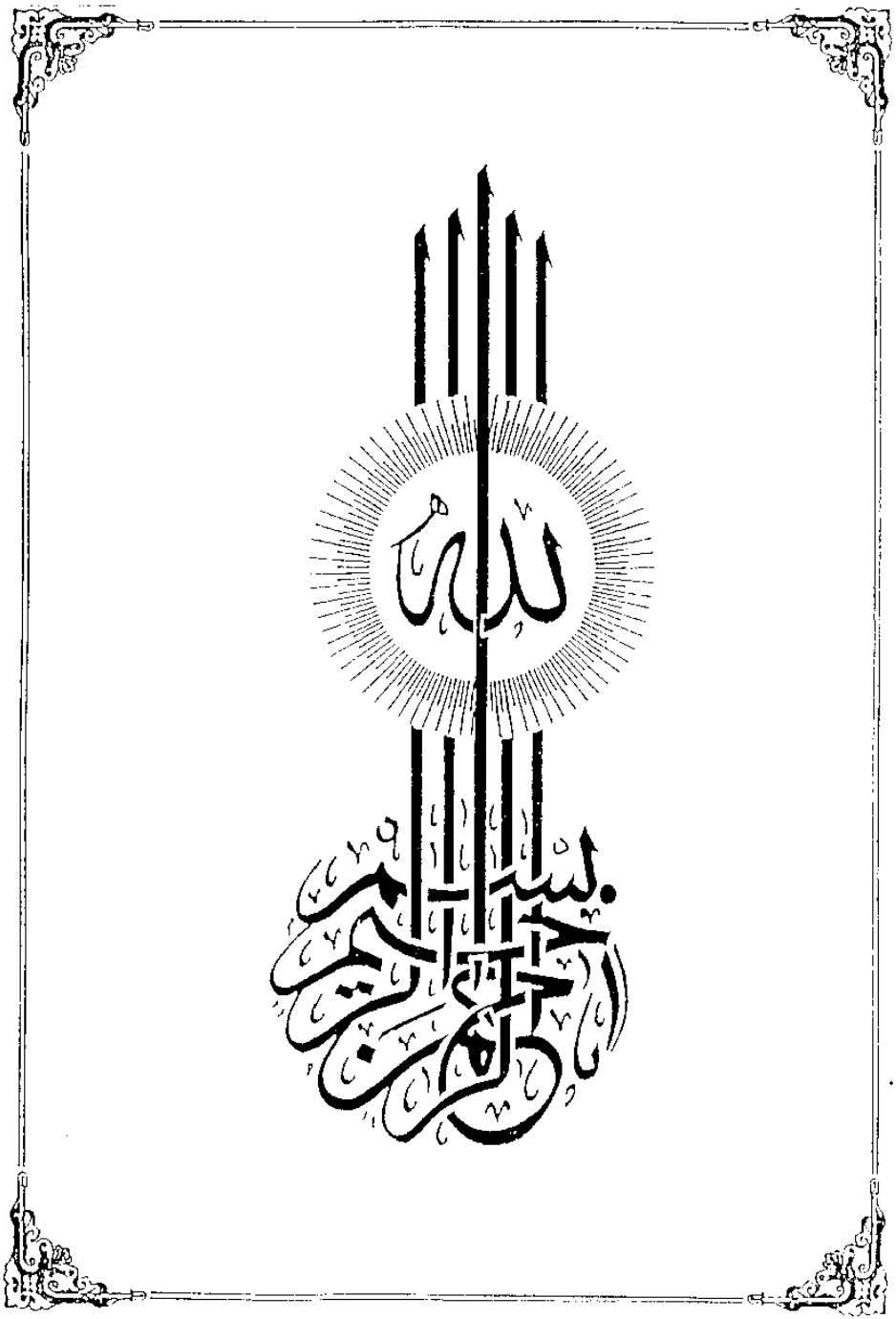

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The diagnosis of traumatic lesions of the skeleton forms a major portion of the work of the most radiological departments. In any cases this is purely complimentary to frank clinical diagnosis.

The radiologist should be prepared to support his radiological opinion by confirmatory clinical examination.

Diseases of the hip joint present some of the most fascinating problems. Practically and economically, its injuries and diseases are important because they so often cause suffering and serious disablement.

Academically, the region is of interest for several reasons:-

The mechanics of the joint are complex and, it is one of the most difficult joints to examine with accuracy.

In this study, we tried to assess the different radiological manifestations of dislocation of the hip joint based on the pathological changes that occur in every type of dislocation with special stress on the role of radiology in the diagnosis of these conditions.

ANATOMY OF THE HIP JOINT

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The hip joint is a synovial joint of the ball and socket variety. It is formed by the reception of the head of the femur into the cup shaped fossa of the acetabulum. The hip joint provides remarkable example of high degree of stability as a result of adaptation of the articular surfaces of acetabulum and femoral head to each other.

THE ACETABULUM

Formed by fusion of the three component bones of the os innominatum. Ilium, ischium, and pubis meet at a Y-shaped cartilage which forms their epiphyseal junction. The stem of the Y lies vertically and passes through the

acetabular notch to obturator foramen. The acetabular articular surface, covered with hyaline cartilage, is a C-shaped concavity. The depth of the acetabulum is appreciably increased by a fibro-cartilaginous rim named the labrum acetabulare, and it is continued across the acetabular notch, which it pulgs to produce the transverse ligament. The central non-articular part of the acetabulum is occupied by a pad of fat known as Haversian pad.

THE SPHERICAL HEAD OF FEMUR

It is adapted to the concavity of the articular surface of the acetabulum. The neck of the femur is narrower than the equatorial diameter of the head and considerable movement in all directions is possible before the femoral neck

impinges upon the labrum acetabulare. The head of femur is covered with hyaline cartilage which, in many cases, encroaches a little on the anterior surface of the neck for articulation with the acetabulum when the hip is flexed.

THE CAPSULE OF THE HIP JOINT

It is attached circumferentially around the labrum acetabulare and transverse ligament, where it passes laterally, like a sleeve, to be attached to the inter-trochanteric line, but behind it extends for only half this distance, being attached half way along the femoral neck. The capsule is loose but extremely strong. From these attachments the fibres of the capsule are reflected back along the neck of the femur, intimately blended with the periosteum, to the

articular margin of the femoral head.

THE SYNOVIAL MEMBERANE

It is very extensive commencing at the margin of the cartilaginous surface of the head of the femur, it covers the portion of the neck which is contained within the joint; from the neck it is reflected on the internal surfaces of the labrum acetabulare, ensheathes the ligament of the head of the femur, and covers the mass of fat contained in the acetabular fossa.

ARTIAL SUPPLY

The arteries supplying the joint are derived from:

1-The obturator artery (posterior branch).

2-The medial circumflex femoral artery.

3-The superior gluteal artery.

4-The inferior gluteal artery.

The vascular supply of the femoral head comes principally through the epiphyseal arteries, the main ones of which course along the superior lateral aspect of the neck. These arteries, usually 2 - 6 in number, arise from the vascular ring about the base of the neck, which in turn is made of vessels from the circumflex arteries with a lesser contribution from the superior and inferior gluteals. Two or three metaphyseal arteries supply mainly the inferior lateral quadrant of the head, and the artery of the ligamentum teres is either absent or supplies only a small area surrounding the ligamentous insertion. The femoral head including narrow elements, has for sometime been recognized to be avascular in a majority of cases following fracture, and it

was postulated that revascularization occured via any remaining blood supply, plus replacement of dead bone by creeping substitution. These findings have all been substantiated, and it is emphasized that what the clinician sees on radigrams and interprets as avascular necrosis is frequently a revascularization with new bone being laid down on old spicules producing increased bone density, or may represent late segmental collapse.

NERVE SUPPLY

The three nerves of the pelvic girdle and lower limb supply the hip joint (Hilton's law):-

1- The femoral nerve via the nerve to rectus femoris.

2- The sciatic nerve via the nerve to quadratus femoris.

3- The obturator nerve directly from its anterior division.

THE LIGAMENTS OF THE HIP JOINT

* Three ligaments strengthen the capsule:-

1- The ilio-femoral ligament.

It arises from the anterior inferior iliac spine and supports the front of the capsule.

2- The pubo-femoral ligament.

It arises from the ilio-pubic eminence and supports the infro-medial surface of the hip.

3- The ischio-femoral ligament.

It arises from the ischium and supports the posterior part of the capsule.

* The round ligament of the head of the femur:-