AETIOLOGICAL DIAGNOSIS OF AVASCULAR NECROSIS OF CAPITAL FEMORAL EPIPHYSIS

THESIS

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(Radio - Diagnosis)

By

RAAFAT ZAHER GHOBRY

M. B.; B. Ch.

Supervised By

Dr. JANNETTEE BOUSHRA HANNA
Assist. Prof. of Radio-Diagnosis

Dr. YOUSSEF HAMED ZAKI
Lecturer of Radio-Diagnosis

Department of Radio-Diagnosis
Faculty of Medicine
Ain Shams University

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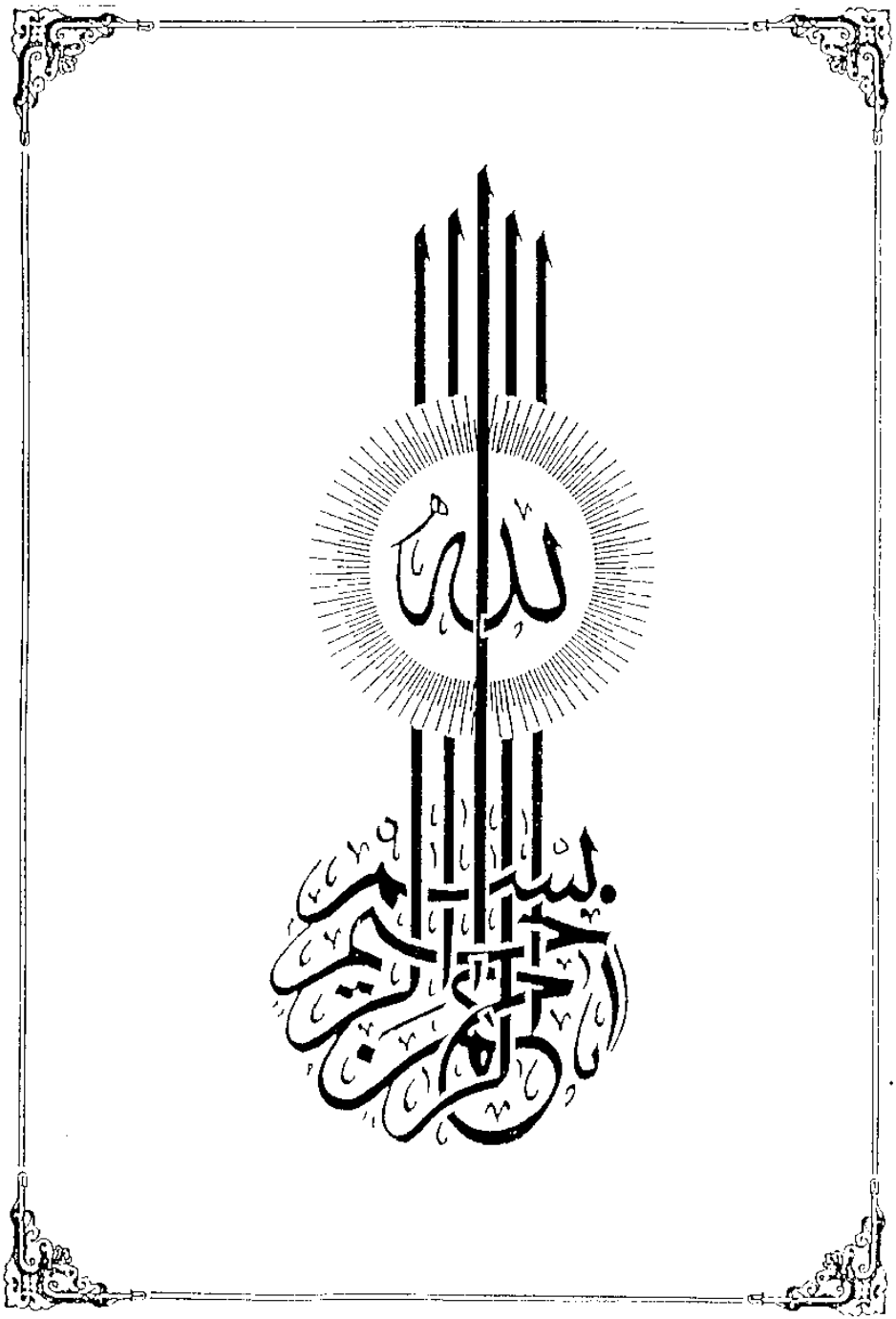

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INTRODUCTION AND AIM OF WORK

RADIOLOGICAL ANATOMY OF HIP JOINT

The pelvis serves as a base for the trunk and as a girdle for the attachment of lower extremities.

The pelvic girdle is formed by the two hip bones infront and at the sides and by the sacrum and cocyx behind.

The pubic bones articulate with each other anteriorly at the midline of the body, forming a joint called the symphysis pubis.

The ilia articulate with the sacrum posteriorly and these joints are called sacro-iliac joints. (Ballinger, 1982).

Hip Bone

The hip bone, also called the OS coxae and OS innominatum, consists of three parts - The ilum, the pubis and the ischium. All three bones enter into the formation of the acetabulum, the cup shaped socket that receives the head of the femur, where they are separated by cartilage in youth but become fused into one bone in adulthood. (Warwick and Williams 1973,Ballinger 1982).

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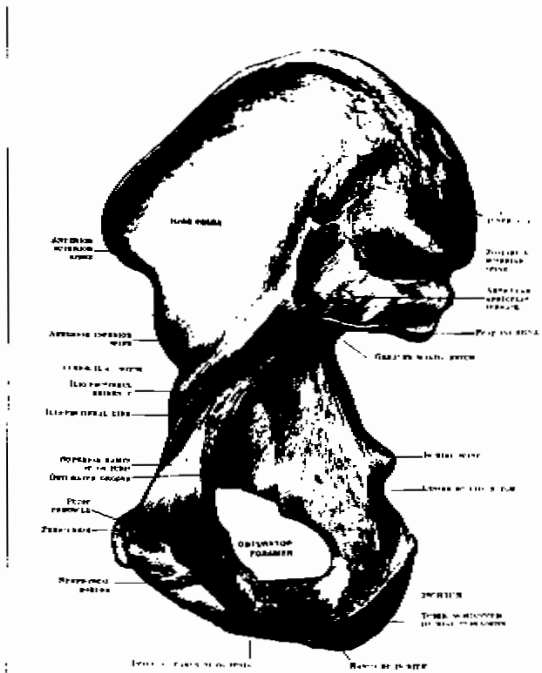

Diagram (1): Hip bone from the medial aspect

(Quoted from Meschan 1959)

the pubis. By this posterior union the rami of the pubis and ischium enclose the obturator foramen. At the upper posterior border of the superior ramus is a prominent projection called the inschial spine.

The lesser sciatic notch lies between the ischial spine and ischial tuberosity. (Warwick and Williams, 1973; Ballinger 1982).

The important anatomic landmarks with regard to the ischium are the following: The body of ischium the ischial spine below the greater sciatic notch; the lesser sciatic notch, below the ischial spine; the ischial tuberosity; the superior ramus and the inferior ramus. (Meschan 1959).

Pubis

The pubic bone consists of a body and two rami - The superior or ascending ramus, and the inferior, or descending ramus. The body of the pubis forms the lower anterior portion of the acetabulum. The superior ramus projects inferiorly and medially from the acetabulum to the midline of the body. Here the bone curves inferiorly and then posteriorly and laterally to join the ischium.

The lower prong is termed the inferior ramus. The upper surface of the superior ramus presents a ridge, the pectin or pectineal line, which is continuous with the arcuate line of the ilium. (Ballinger, 1982).

The lines of union of the pubis and ischium are frequently readily evident on the radiograph. (Meschan, 1959).

Acetabulum

The acetabulum contains both an articular and a nonarticular portion, the acetabular fossa and lunate surface respectively.

The nonarticular portion is formed mainly by the ischium, and is continuous with the margin of the obturator foramen. The margins of this socket, although thick, are subject to fracture.

The shelving portion of the acetabulum is also of considerable importance, and when defective in development, congenital dislocation of the hip may result.

The articular portion resembles is semilunar in shaped with its concavity directed toward the obturator foramen and it extends in irregular fashion around the ligamentum teres, excluding the latter structure from the synovial cavity. The outer edge of the articular portion is rough and uneven and gives attachment to the glenoidal labrum which deepens the socket. (Diagram 2) (Meschan 1959).

Femur

The proximal end of the femur consists of a head, a neck and two large processes termed the greater and lesser trochanters. The head is smooth and rounded and is received into the acetabular cavity of the hip. It is connected to the shaft by a pyramid-shaped neck.

the head is completely covered with articular cartilage except over the small roughened pit to which the ligament of the head (ligamentum teres) is attached. This pit is known as the fovea centralis.

The neck is constricted near the head but expands to a broad base at the shaft of the bone.

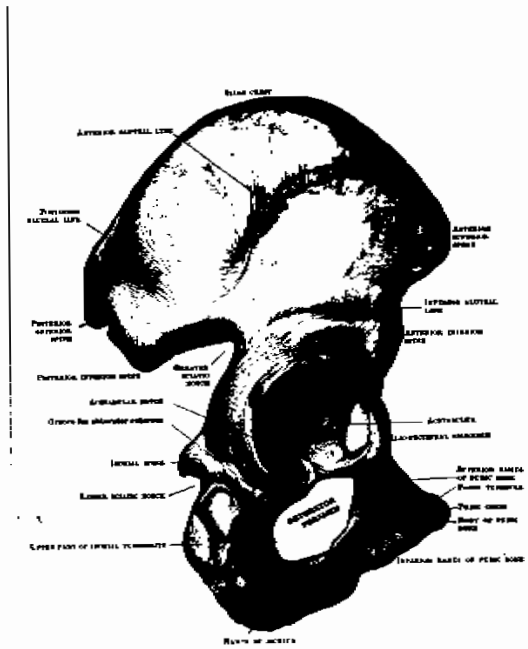

Diagram (2): Hip bone from the lateral aspect.

(Quoted from Meschan 1959)

The neck projects medially, superiorly and anteriorly from the shaft. The trochanters are situated at the junction of the shaft and the base of the neck, the greater trochanter at the upper lateral part of the shaft and the lesser trochanter at the posterior medial part . (Diagram 3).

The prominent ridge extending between the trochanter at the base of the neck on the posterior surface of the shaft is called the intertrochanteric crest. (Diagram 4). The less prominent ridge connecting the trochanters anteriorly is called the intertrochanteric line.

The upper portion of the greater trochanter projects above the neck and curves slightly posteriorly and medially. The most prominent point of the lateral surface of the greater trochanter is always in direct line with the upper border of the neck of the femur. The angulation of the femur varies considerably with age, sex and stature In the adult of average form the neck projects anteriorly from the shaft at an angle of approximately 15 to 20 degree and superiorly at an angle of approximately 120 to 130 degrees to the long axis of the shaft. (Warwick and Williams 1973, Ballinger 1982).

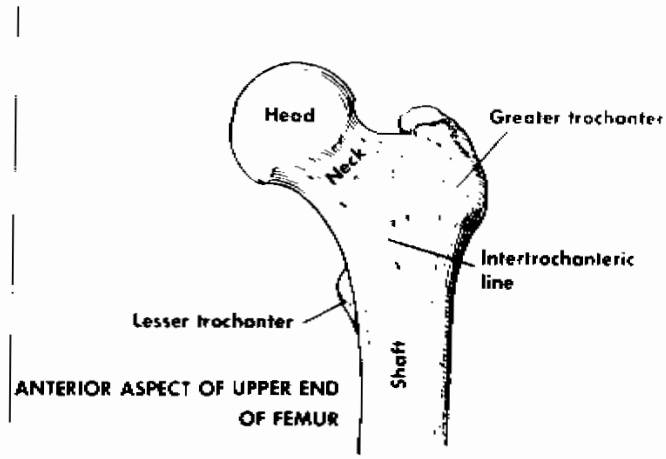

Diagram (3): Anterior aspect of the upper end of femur

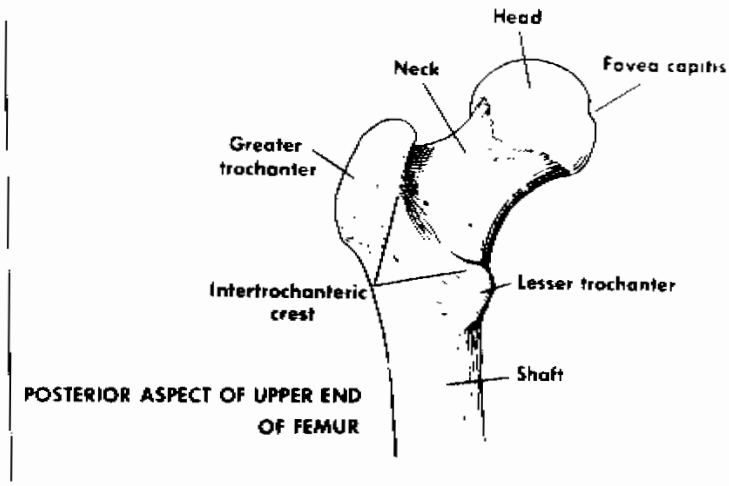

Diagram (4): Posterior aspect of the upper end of femur (Quoted from Ballinger 1982)