ULTRASONOGRAPHIC IMAGING OF HIP JOINT DISEASES IN CHILDHOOD

Essay
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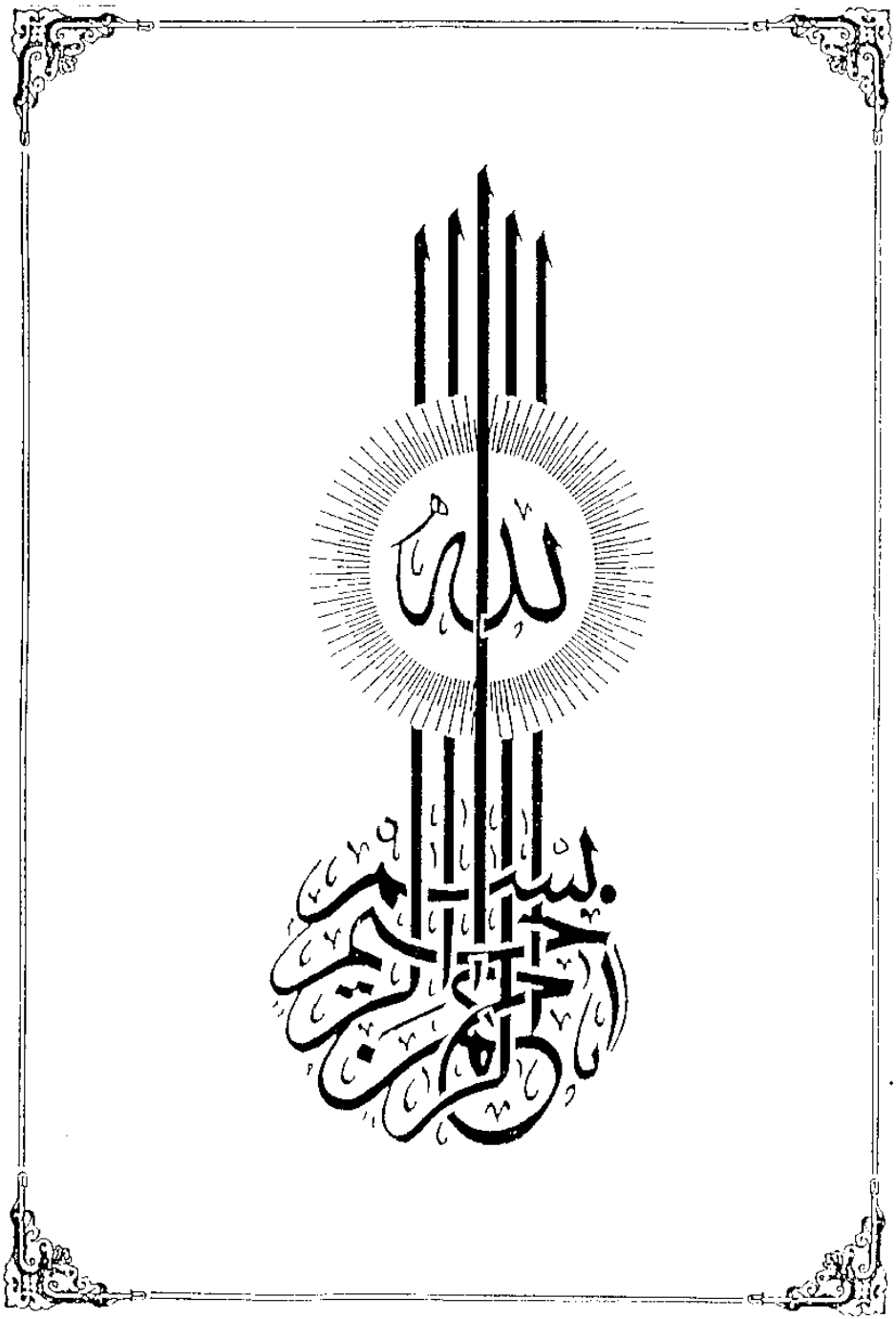

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INTRODUCTION

ULTRASONOGRAPHIC IMAGING OF HIP JOINT DISEASES IN CHILDHOOD

Introduction

Imaging of a diseased joint is an essential procedure to confirm the diagnosis It is important to know how the available modality may contribute to the information requested.

[Brower and Kransdrof, 1990].

Routine radiography has been remaining the "gold standard" as it is inexpensive and available and the most familiar for physicians.

[Pitt et al., 1990].

The firtst trial of using ultrasound imaging in hip joint diseases was done by Graph in 1980.

[Novick et al., 1988].

Ultrasonography is now of great value over conventional radiography in diagnosing hip dysplasia and evaluating its treatment.

[Millis and Share, 1991].

Early in the infection of hip joint, and if therapy is started promptly, the radiography may never appear abnormal. Also, ultrasonograpy can help in such situations.

[Kleinman and Spevak,1990].

As ultrasonography is non invasive, radiation - free and

can evaluate the cartilaginous structure of the hip, ultrasonography offers unique advantages in the assessment of the infant hip.

[Millis and Share, 1992].

Aim of work

This study correlates normal anatomy of the hip with its ultrasonographic images, discusses the details of these techniques, and evaluates the ultrasonographic role in hip joint diseases in childhood.

CHAPTER 1

NORMAL ANATOMY OF THE HIP JOINT

Normal Anatomy of the hip joint

The hip joint is a multiaxial synovial joint of the ball and socket variety. It is formed by the articulation of the head of the femur with the cup shaped fossa of the acetabulum. The center of the hip joint lies 1,2 cm below the middle third of the inguinal ligament. The stability of the joint is the result of the adaptation of the articulating surfaces of the acetabulum and femoral head to each other.

The articular surfaces are spheroidal and slightly ovoid surfaces becoming almost spherical with advancing age.

Articlar surfaces of the hip joint (Figure 1)

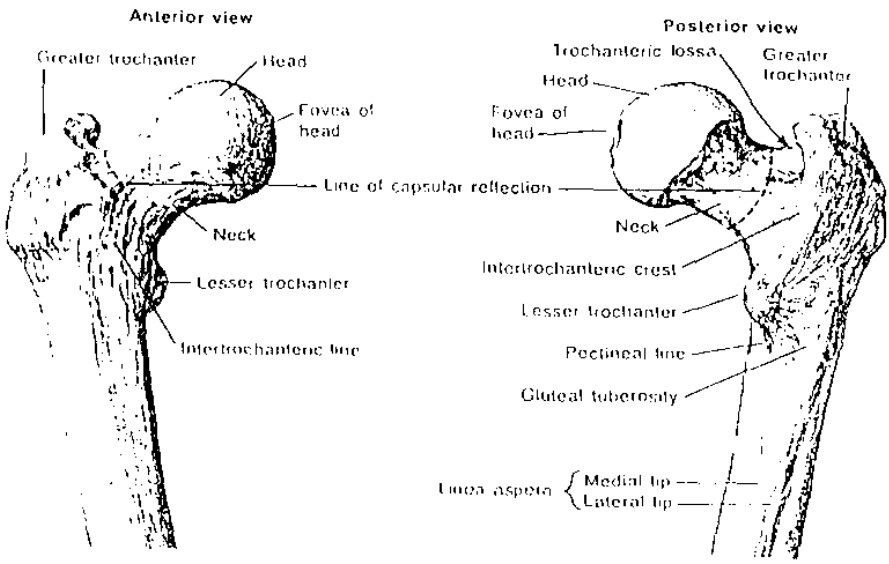
Acetabulum:

The acetabulum is a deep hemispherical socket, 3.5 cm

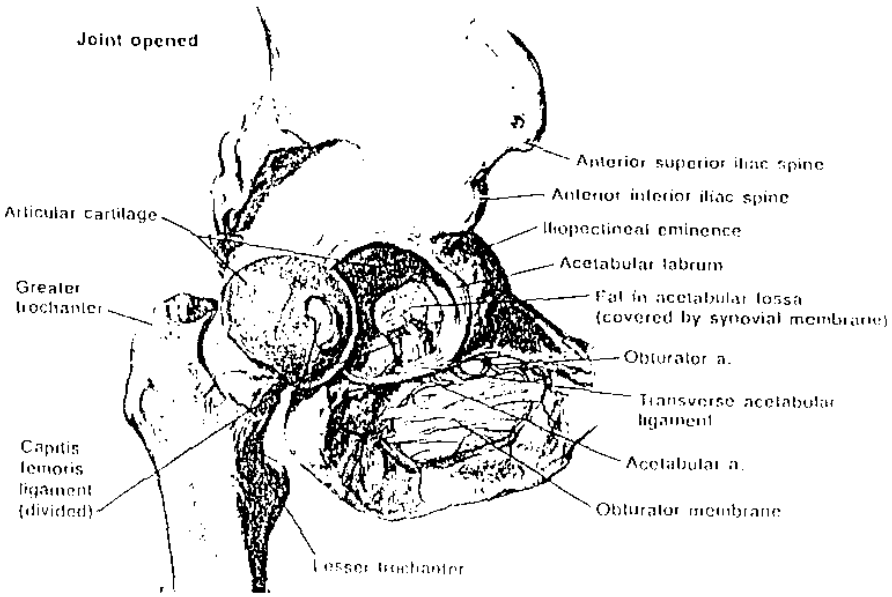
in diameter, located on a high ridge of compact bone conneting the anterior srperior iliac spine with the ischial tuberosity. It divides the external surface of the hip bone into an anterior portion sloping anteriorly and medially and a posterior portion sloping backword.

These slopes affect the direction tafeken by the head of femur when it is dislocated. The ilium, ischium; and pubis share in the formation of the acetabulum at birth, they are set apart from each other by a triradiate or y-shaped bar of cartilage, that begins to ossify at the twelfth year and the

Figure (1)



The proximal part of the right femur



The Hip joint : joint opened.

From " The Ciba Collection of Medical Illustrations" Vol.8 Part I.
CIBA - GEIGY CORPORATION , 1987.

bony segments fuse by the sixteenth or seventeenth year of age.

The acetabulum is delimited by a sharp bony rim of compact bone, The continuity of this rim is interrupted below by a broad deep notch, the "acetabular notch". this notch extends upward to an irregular rough area in the floor of the acetabulum which lodages the a ttachment for the ligamentum teres, an intra-articular ligment of the hip joint.

-The "Transverse ligament" bridges over the acetabular notch and completes the circumference of the acetabulum. The "acetabular labrum" is fibro-cartilagenous rim, attached to the acetabular margin deeping the cup. It bridges the acetabular notch as the transverse acetabular ligament completing the circrle. The labrum is triangular in section; it is attached by its base to the acetabular rim, the apex being its free margin. The acetabular articular surface an incomplete ring, the "lunate surface" broadest above where pressure of the body weight falls in the eract posture, narrowest in its pubic region and absent below. Opposite the acetabular notch, the floor of the acetabulum is non-articular and is related internally to the flat surface of bone which gives attachement to the obturatar internus muscle and forms the lateral bony wall of the pelvic cavity. The acetabular fossa contains

fibro-elastic fat largely covered by synovial membran.

(Mc Vay, 1986) .

The head of femur

It forms more than half of a sphere. Its globoid surface is covered by cartilage as far as its junction with the neck. A small pit-like depression (fovea capitis), located a little behined the summit of the head, and lodges the femoral attachment of the ligamentum teres, through which the head recieves a small arterial supply The main diameter of the head is 39.9 mm, while the least deameter is 30 mm, and the greatest diameter is 48 mm. *(Mc Vay, 1986).*

The neck of the femur is inclined to the shaft at an angle varies from 160 in the child to approximately 125 in which the adult (angle of inclination, vertical neck-shaft angle).

The head and neck of the femur lie on a plane a little oblique to that of the line joining the two condyles by 15 approximately; this is called the angle of declination, torsion or forward neck shaft angle *(Rock wood,1984).*

The lesser trochanter

It is a conical posteromedial projection of the shaft at the posteroinferior aspect of its junction with the neck. Its summit and anterior surface are rough, but its posterior surface at the distal end of the inter trochanteric crest is smooth *(Gray, 1989).*