SUMMARY AND CONCLUSION

Developmental dysplasia of the hip (DDH) is the result of a disruption in the normal relationship between the acetabulum and femoral head. DDH is a spectrum of disorders affecting the proximal femur and acetabulum that are, dislocated, dislocatable, subluxed and subluxable. Early diagnosis and treatment is important because failure to diagnose DDH in the neonates and young infants can result in significant morbidity.

The failure to diagnose and treat DDH in the immediate neonatal period can result in significant morbidity, including closed treatment failure, the need for open reduction, persistent dysplasia; recurrent dislocation; and, most significantly, avascular necrosis of the femoral head.

Physical examination is an important method in the diagnosis of DDH, and it is part of the routine clinical evaluation of the neonate. The Barlow maneuver is used to determine if a hip is dislocatable. The Ortolani maneuver is used to reduce a dislocated hip. The Allis, or Galeazzi, sign is an asymmetry of the skin folds caused by an apparent shortening of the thigh.

Ultrasonography (US) is the preferred modality for evaluating the hip in infants who are 6 months or younger. US enables direct imaging of the cartilaginous portions of the hip that cannot be seen on plain radiographs. Furthermore, US examination enables dynamic study of the hip with stress maneuvering.

One should use the Highest-frequency transducer that provides adequate penetration of the soft tissues to the depth required. For infants up to 3 months of age, the 7.5-MHz transducer is successful. A 5-MHz transducer is generally required between 3 and 7months of age.

Diagnosis of congenital hip dislocation has been defined by (static) morphologic testing and by (dynamic) assessment of stability of the femoral head in the acetabulum. An Austrian orthopedist, Professor Graf, first introduced US static examination of the hip in 1980. His technique included the calculation of numerous angles, and the orientation of the B-mode images on right coronal projections. With the advent of real-time US, in 1984, Dr Harcke introduced a dynamic approach to studying the hips, and his dynamic approach is predominantly used in US examination.

I- Graf's standardized morphology criteria are static method and widely used. The standard coronal sectioning plane must be used at the deepest portion of the acetabulum, where the ilium appears as a straight line, perpendicular to the femoral head and parallel to the surface of the transducer.

II- The dynamic ultrasound method used in the diagnosis of DDH was described by Harcke. This technique incorporates the use of real time. The examination is performed in the coronal, similar to Graf's technique, and axial planes. However, two key points differentiate it from Graf's. First, it takes into consideration the position of the femoral head. Second, it incorporates the Barlow's maneuver in both imaging planes in trying to demonstrate instability.

III- A complementary static method is for assessing acetabular development, the distance between the medial aspect of the femoral head and the baseline (d) is compared with the maximum diameter of the femoral head (D); this d/D ratio is expressed as a percentage. This ratio represents the coverage of the femoral head by the bony acetabulum in the standard coronal plane. Coverage of 58% or greater is considered normal. The smaller the coverage, the greater the acetabular immaturity.

Plain Radiographs of the pelvis are most helpful when significant ossification of the capital femoral epiphyses has occurred and when adequate US evaluation cannot be performed.

Plain radiography has low sensitivity, expose the infant to ionizing radiation, and do not provide dynamic information. Radiographs are difficult to interpret before the capital femoral epiphyses ossify.

Computed Tomography (CT) is useful for evaluating complicated dislocations, as well as postoperative evaluation of the hip. CT can depict osseous blocks to relocation, as well as iliopsoas tendon capsule constriction, a thick ligamentum teres, and fibrofatty pulvinar hypertrophy. CT also can be used to evaluate femoral and acetabular anteverison.

Arthrography can be performed to assess the dislocated hip; often, it is performed at the time of surgical reduction, particularly if the reduction appears to be difficult to maintain. The indications for arthrography are fewer with better sonography, the advent of MRI, and the availability to confirm reductions in spica casts with CT.

Magnetic Resonance Image (MRI) can be useful in the preoperative and postoperative evaluation of a hip with many complications. MRI can be used to distinguish the labrum, capsule, and acetabular cartilage. MRI is useful for detecting the complications of DDH and treatment, such as avascular necrosis of the femoral head and joint effusions. MRI also can be used to demonstrate iliopsoas tendon compression, a thick ligamentum teres, and pulvinar hypertrophy.

In conclusion the Ultrasonography is the best imaging modality in diagnosis of DDH in neonates as it can assess the hip joint before ossification of the femoral head also can assess the cartilaginous surfaces of the hip joint. We also can assess the stability of the femoral head in the acetabulum, (dynamic assessment).

US has no radiation hazards as in X-ray radiography and CT, no sedation used as in CT and MRI, not expensive as MRI, not invasive as in arthrography.