

## Hip Dysplasia (DDH,CDH)

Generally the terms DDH (developmental dysplasia of the hip) or CDH (congenital dysplasia of the hip) are used to describe an array of conditions. These terms will apply to a hip that can be subluxed by special clinical tests (e.g. Ortolani test) as well as to a chronic subluxation or even dislocation of a hip, meaning that the affected femoral head has no contact with the socket (acetabulum).

The hip joint is often referred to as a ball and socket joint. The ball, which represents the femoral head in our simplified model, is held in its cup-shaped socket (acetabulum) by a joint capsule, tendons and multiple muscles. In order for the femoral head to remain in its place, the bony coverage by the acetabulum must meet certain anatomic requirements. In DDH these requirements are not met. Coverage of the femoral head is insufficient. Depending on the degree of insufficient covering the head will be able to move in and out of the cup. Not always does the femoral head slip out completely.

The first assessment of a newborn always should include an examination of the hip joints. The incidence of hip dysplasia varies, and can be as high as 5% in certain ethnic groups. Generally the incidence is thought to be at about 1% of all newborns. High risk factors for DDH have been established of which a positive family history, ethnic background, breech position and female gender are the most important.

Early diagnosis and treatment is important. On physical examination we might encounter asymmetric gluteal folds; a clinical leg length discrepancy may be seen. In complete hip dislocation abduction of the hip might be reduced. Further examination is warranted in these cases. Ultrasound has proven to be the best imaging technique in this situation. Since certain parts of the femur are still cartilaginous, an x-ray would not be able to picture the dysplasia nearly as good. Most examiners will use either the method described by HARKE or the GRAF method. The ultrasound does not expose the child to irradiation and is completely pain free. The degree of dysplasia can be determined and classified according to GRAF. Treatment largely depends on the degree of dysplasia. Although the treatment may vary, the goal remains the same; stable positioning of the femoral head in the acetabulum in order for the acetabulum to improve its coverage. Stable positioning can be achieved by bringing both hips into a flexed and abducted position much like a squatting position. Many hip abduction splints will hold the babies legs in this position. Double or triple diapers were used in the past, but are not sufficient for therapeutic ends. The Pavlik harness is a widely used brace and can even be used as an attempt to reduce subluxed or dislocated hips. Does the Pavlik treatment fail continuous traction and immobilization in a spica cast might be the treatment of choice. Does the hip not reduce surgical reduction will be considered. In older children an open reduction is the only way to reduce a dislocated hip.

Children with DDH need regular follow-up, even once reduction has been achieved. In some cases mild acetabular dysplasia will persist. Untreated this might can lead to early degenerative joint disease. It is important to continuously monitor these patients and if necessary correct the remaining dysplasia by yet another surgical procedure.

This summary makes clear why early diagnosis of DDH is so important. Up to 50% of osteoarthritis to the hip in adults is thought to be secondary to remaining dysplasia. A simple ultrasound can detect even mild dysplasia and early treatment will improve the outcome significantly.

