

Young Adult and Adolescent Hip Preservation

Anatomy of the Hip:

The hip joint is a simple ball-in-socket joint. The round ball-shaped femoral head rotates inside a cup-shaped socket called the acetabulum. The joint cartilage, fluid and the round surface of the joint allows it work smoothly with little friction and wear. The labrum (bumper) is a rim of fibrous cartilage which lines the outer edge of the socket, acting to stabilize and cushion the hip joint, similar to the meniscus in the knee joint.

Conditions Associated with the Hip:

Femoroacetabular impingement (FAI):

Relatively minor abnormalities in the orientation, the size, and the shape of the hip have been identified as reducing the clearance for hip motion by causing impingement (jamming). Over a period of time this jamming leads to labral tears, articular damage and ultimately arthritis of the hip. The jamming often occurs when one bends the hip, as while sitting in a chair or squatting on the ground.

There are two types of FAI.

1) Cam impingement:

Cam is a projecting part of a rotating wheel. The femoral head should be a round structure with no projection. However some femoral heads are aspherical and some have a bump at the head-neck junction that cause jamming of the femoral head. This causes tears in the labrum and the articular cartilage. If this process continues untreated more damage is expected which ultimately fails the joint. Cam impingement is predominantly seen in young adults ages 20 to 30 years.

2) *Pincer impingement:*

This type of impingement is observed when the socket is deep or it is facing backwards.

The neck jams causing extensive labral tears and damage to the articular cartilage.

Continued insult to the labrum and cartilage causes pain and arthritis. Pincer impingement is observed in young females' ages 30 to 40 years.

- Most patients have a combined cam + pincer femoroacetabular impingement.
- The good news is that if this condition is identified earlier, joint degeneration and arthritis could be prevented by early and timely intervention.
- Early results are encouraging in preventing arthritis and providing a pain free hip.

Hip Dysplasia:

Developmental Dysplasia of the Hip (DDH) is a relatively common abnormality in the shape of the hip joint. DDH is the most common developmental hip deformity causing symptoms in adults.

The most common form of hip dysplasia consists of a shallow acetabulum (hip socket). The shallowness of the acetabulum causes the head of the femur to exert excessive pressure on the rim of the acetabulum. If left untreated, this excess rim pressure can lead to pain and injury to the cartilage and/or bone which may result in osteoarthritis.

The severity of DDH varies widely. In the mildest types of dysplasia, the hip is normal in outside appearance, is very close to normal on x-ray, and may not cause any symptoms until the patient is 30 years of age or older. Hip dysplasia is commonly detected in young females with hip pain or sometimes incidentally on x-rays of the pelvis done for other purposes.

Other hip conditions:

Perthes disease, avascular necrosis, slipped capital femoral epiphysis (SCFE) cause damage to the joint by mechanism of femoroacetabular impingement or dysplasia. Often, these potentially damaging deformities do not cause symptoms. If they remain undiagnosed and untreated over the course of years, this may lead to arthritis that otherwise could have been prevented. Most mechanical abnormalities in the hip can be treated if they are diagnosed correctly and fixed early enough with joint realignment (osteotomy) or bone trimming procedures.

How to Test for any abnormalities:

Special hip x-rays, CT scan and MRI may be required for evaluation of the problem and the status of the labrum and the cartilage.

What are the treatment options?

Treatment can be non-surgical or surgical depending on the symptoms, deformity and the expected damage in the joint.

- ***Non-Surgical Treatment***

These treatments include activity modification and physical therapy (to strengthen muscles), weight loss, and/or pain medication. Although they can alleviate some symptoms the underlying abnormality is not corrected.

- ***Surgical Treatment***

Early and timely intervention can prevent further damage to the joint. The principle of surgery is to correct a mechanical problem (FAI, hip dysplasia) with a mechanically based joint preservation surgery to improve pain, function and longevity of the hip joint.

- ***Hip Arthroscopy***

Arthroscopy is a minimally invasive technique for treating intrarticular problems in the hip such as mild to moderate FAI. The procedures include labral debridement, labral repair and/or shaving of the bone.

- ***Mini Arthrotomy***

Arthrotomy is a procedure in which the capsule surrounding the hip joint is opened. Mild FAI could be treated with shaving of the bone and some labral tears can be repaired through this approach.

- ***Surgical Hip Dislocation:***

This option is a little bit more of an invasive procedure in which the capsule surrounding the hip joint is opened and the femoral head is completely separated from the socket. This approach gives the best view of the femoral head and the socket. Multiple procedures can be accomplished such as shaving of the bone from the head neck junction (osteoplasty), labral repair, trimming of a deep socket and/or microfracture of the damaged cartilage.

- ***Periacetabular osteotomy (PAO)***

Osteotomy is the primary procedure to correct hip dysplasia. A single incision is made and the tilt of the shallow socket is corrected. The upward tipped socket is redirected in a way that it is more horizontal. Only realignment operation like PAO can correct the underlying mechanical problem and abnormal tilt of the acetabulum.