NORTH EAST HIP CLINIC
movement restored

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CONDITIONS

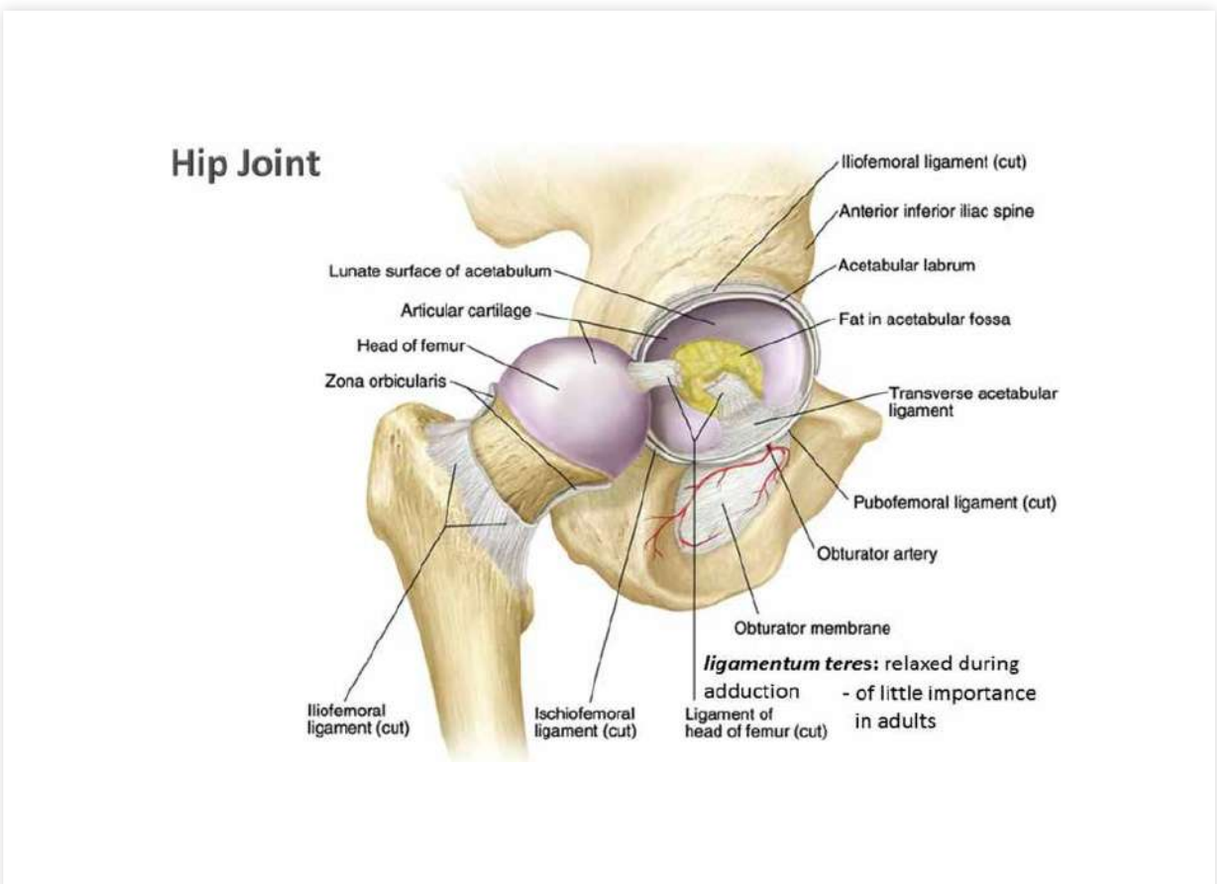
2024

The Hip Joint

The hip joint is a congruent articulation of the femoral head (ball) and the acetabulum (socket) (Figure 1) while the acetabular labrum is a ring of fibrocartilage that is attached around the circumference of the acetabulum. The labrum increases the depth of the acetabulum, effectively increasing the surface area of contact and thereby provides stability to the joint.

Another important function of the acetabular labrum is to maintain the synovial fluid and the fluid pressure by sealing the joint and acting as a lubricator between the femoral head and acetabular cartilage. A tear in the labrum could result in a loss of this suction-seal effect increasing in the joint forces, which could potentially put the acetabular cartilage at a high risk of degeneration.

Injuries to the acetabular labrum can occur from chronic trauma due to repetitive hip motion or from acute trauma as, for example, from a direct blow to the hip or a forceful abnormal movement of the hip.



Femoroacetabular Impingement

What is Femoroacetabular Impingement?

An abnormal shape of the hip can lead to impingement of the labrum and the edge of the acetabulum (chondrolabral junction) between the femoral head and acetabular rim during hip movements, especially deep flexion and internal rotation. These abnormalities can be grouped as 'femoroacetabular impingement' (FAI). There are two main types of impingement. Firstly caused by an aspherical femoral head (cam impingement lesion) or prominent acetabular rim (pincer lesion) or a combination of the two (Figure 2 a-d).

Repetitive forceful impact of the femoral head neck junction at or against the acetabular rim causes damage, exposing the articular cartilage to abnormal shear stress resulting in chondral cleavage and delamination which over a period of time leads to progressive chondral loss and more advanced degeneration-osteoarthritis.

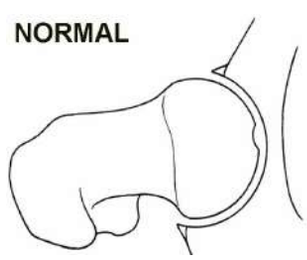


Figure 2a – Congruent ball and socket joint (axial profile)

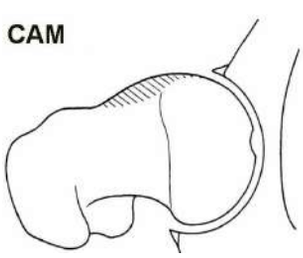


Figure 2b – Incongruent hip caused by abnormal prominence of the femoral head (Cam lesions)

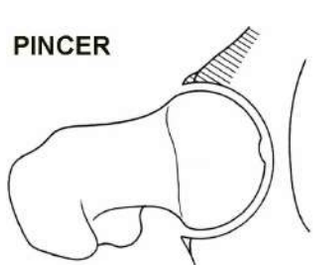


Figure 2c – Incongruent hip caused by abnormal prominence of the acetabular rim (Pincer lesions)

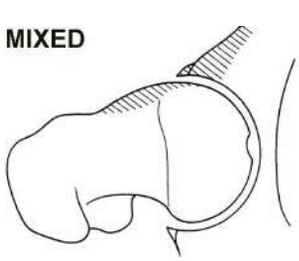


Figure 2d – Incongruent hip caused by mixed Cam and Pincer lesion

Cam lesion can be secondary to other pathologies in the hip like slipped capital femoral physis or perthes or idiopathic pistol grip deformity (Figure 3) leading to lack of anterior clearance and reduced femoral head-neck offset.

Pincer lesion can be secondary to deep sockets as in coxa profunda and protrusion acetabuli or acetabular retroversion (Figure 4) leading to acetabular overcoverage by the anterior acetabular wall.

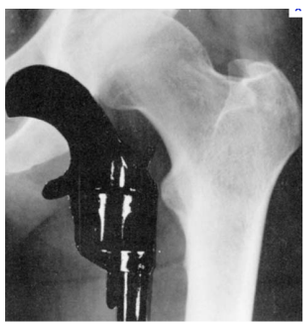


Figure 3 – Cam lesion leading to pistol grip deformity

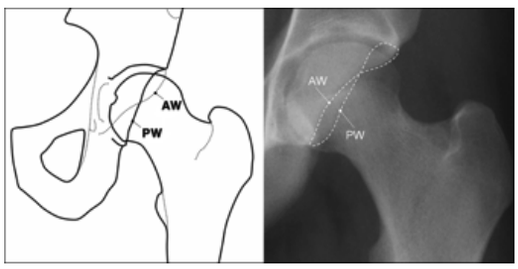


Figure 4 – Acetabular retroversion causing crossing over of anterior (AW) and posterior (PW) acetabular walls, will lead to pincer type pathology

Natural History of Femoroacetabular Impingement (FAI)

The concept of FAI is relatively new and was first introduced when Ito et al. in 2001, working under the supervision of Professor Reinhold Ganz, published a dynamic MRI-based study looking at the morphology of the femoral head/neck junction. They hypothesised that asphericity of the femoral head, with decreased anterior offset, may cause impingement between the femur and acetabular margin, causing labral tears.

Subsequently, Ganz et al., 2003, reviewed over 600 non-dysplastic patients who had a surgical dislocation for the treatment of FAI, mapping the areas of cartilage damage or loss and expanded on the concept of FAI, proposing that the condition was a precursor of osteoarthritis (OA). Similarly, Tanzer et al., 2004, linked osseous abnormality caused by FAI with early OA.

They linked patients from three separate studies and found a common aetiology between patients requiring hip arthroscopy for labral tear, hip cheilectomy for FAI and hip replacement for idiopathic arthritis. They found that repetitive anterior FAI resulted in groin pain, labral tear and chondral damage, leading to arthritis. Pistol grip deformity caused impingement in 97% of patients in the arthroscopic labral tear study and 100% of cases in idiopathic arthritis. These studies concluded that FAI leads to osteoarthritis.

How Common is FAI?

Hip shape abnormalities characteristic of FAI are common in the young adult population. The prevalence of hip shape abnormality is reported to be higher in asymptomatic athletes than in the general population, the reasons for this remain unclear. A recent systematic review identified 26 studies for inclusion, comprising 2,114 asymptomatic hips. The prevalence of an asymptomatic cam deformity was 37%; 54.8% in athletes versus 23.1% in the general population. The prevalence of asymptomatic hips with pincer deformity was 67%. Only 7 studies reported on labral injury, which was found on MRI without intra-articular contrast in 68.1% of hips.

It is not yet understood why some people develop symptoms (FAI syndrome) while others do not. The mechanism of development probably involves a combination of factors; with hip shape abnormality combining with the level and type of activity to provoke impingement. There may also be a genetic predisposition to shape abnormality and/or soft tissue damage in these patients. The natural history of FAI and long-term progression to OA remain topics of much debate and ongoing research. Although Ganz et al. and Tanzer et al. have proposed a link between arthritis of the hip and FAI, it is too soon to conclude whether surgery will delay the progression of osteoarthritis.

Hip Dysplasia

What is Hip Dysplasia

Hip dysplasia is a condition where the acetabulum is shallow leading to abnormality in the weight bearing zone or concentration of pressure load. Normally, pressure forces in weight bearing are widely distributed over the femoral head.

Acetabular dysplasia reduces the weight-bearing zone in the hip leading to abnormally high pressure in the anterolateral zone of the acetabular margin that may lead to labral hypertrophy and subsequently detachment which can, quite commonly, be radiologically seen as os acetabulare (Figure 7) after labral calcification.

Labral detachment further increases the contact stress between the articulating surfaces and ultimately the actabular cartilage delaminates and progresses to osteoarthritis. The cause of acetabular dysplasia is typically congenital/developmental, although there are conditions during the childhood like Perthes that may lead to secondary dysplasia of the hip.

Femoral deformities, such as coxa vara or anteversion, can similarly cause concentration of the pressure forces over a small area, which is likely to break down.

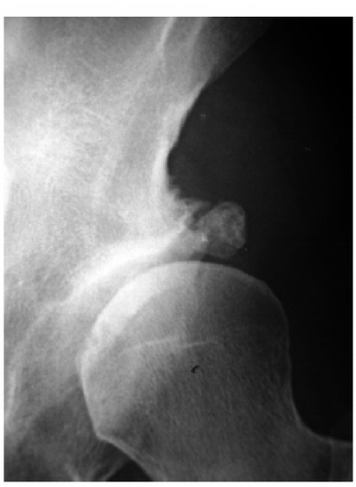


Figure 7 - Os acetabular caused by labral calcification and detachment; a sign of excessive pressure in the anterolateral acetabular rim in hip dysplasia

Trochanteric Pain Sydrome

What is Trochanteric Pain Sydrome

Trochanteric pain syndrome is used to describe all painful conditions around the outer aspect of the hip. It may be caused by trochanteric bursitis, gluteus medius/minimus tendinopathy or other inflammatory conditions of the hip.

The mainstay of treatment for these is physiotherapy and injections, as required. Occasion patients require surgery to deal with the bursitis and tendinopathy. Surgery can be performed via key holes (hip arthroscopy). Some patients may require repair of the tendon.

Deep Gluteal Pain Syndrome

What is Deep Gluteal Pain Syndrome

Patients with this condition present with buttock pain, which may radiate along the back of the thigh. The symptoms mimic sciatica and back problems need to be excluded. This may be caused by piriformis tendonitis, hamstring tendinopathy or inflammation of other tissue in that region.

Most of these improve with physiotherapy alone but some patients may require injections. For patients with longstanding problems surgical treatment may be beneficial. The type of surgery would depend on the cause of the problem.

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Ajay Malviya is a Consultant Orthopaedic Surgeon at Northumbria Healthcare NHS Foundation Trust in the North-East of England. He specialises in pathologies affecting the young adult hip and has expertise in periacetabular osteotomy for hip dysplasia using a minimally invasive approach and hip arthroscopy. He has a wide tertiary referral practice and is one of the highest volume hip preservation surgeons in the United Kingdom. In his routine practice, he deals with sports injuries of the hip and has published and presented widely on the results of hip arthroscopy and pelvic osteotomy in athletes and the general population. He has also completed a PhD on the role of hip arthroscopy in femoroacetabular impingement.

He is the Treasurer of the British Hip Society and a Trustee and the past-Chairman of the UK Non-Arthroplasty Hip Registry, which collects outcomes on hip preservation procedures performed in the UK and leads research initiatives from the Registry. In addition, he is the Deputy Editor of the Journal of Hip Preservation Surgery (Oxford University Press). He is also the Associate Editor of the Journal of Orthopaedics and in the Editorial Board of the American Journal of Sports Medicine.

He has an active interest in research with more than 100 publications in peer-reviewed journals to his name, and lectures nationally and internationally. He is also the Chair of the SICOT (Société Internationale de Chirurgie Orthopédique et de Traumatologie) Research Grants committee and Vice Chair of the ISHA (International Hip Preservation Society) Research Committee. He was awarded the prestigious ABC (America-Britain- Canada) fellowship in 2016 and travelled around North America, visiting several high-profile centres.

He is heavily involved in training and is an examiner for the Royal College of Surgeons (FRCS T&O). He is the Vice-Chair of in the BOA Education and Careers committee and has been the National Lead of the UK and Ireland orthopaedic in-training examination (UKITE) for almost ten years. His fellowship has trained Consultants who are now working in various parts of the country.

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