Femoroacetabular impingement syndrome – a pain in the hip

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The presentation of elderly patients with hip pain due to osteoarthritis is familiar to most general practitioners. Hip pain in the younger adult, particularly men, can be a less familiar and more challenging presentation. In this article the authors describe femoroacetabular impingement syndrome, an increasingly recognised cause of hip pain in the younger population.

There has been a great improvement in understanding the causes of young adult hip pain and its treatment over the last 15 years. A significant cause is femoroacetabular impingement (FAI) syndrome. FAI is a process whereby abnormal hip anatomy can result in increased contact between the femur and acetabulum in certain joint positions. Repetitive hip movements, resulting in excessive collision between the bones, can cause soft tissue damage around the hip (especially the labrum and cartilage), which can cause symptoms including pain. Its continuous nature can eventually instigate osteoarthritis of the hip joint.

Two types of abnormal anatomy have been described: cam morphology, with excessive bone at the femoral head/neck junction resulting in a non-spherical femoral head; and pincer morphology, with excessive bone at the edge of the acetabulum. A combination mixed morphology can also occur (Figure 1).

In most cases, the cause of the abnormal morphologies is unclear. Intensive sporting activities during adolescence may play a role, as may genetics. Not all individuals with abnormal anatomy will go on to develop problems with their hips – approximately one quarter of the asymptomatic general population may have cam morphology and as many as half of the athletic population. In order to be diagnosed with FAI syndrome, the patient requires the predisposing morphology (as evidenced on imaging) in addition to appropriate symptoms and clinical signs.

PRESENTATION
The classic presentation of FAI is active, athletic men in their 30s to 40s who have severe hip pain and a history of sporting activity. The pain is usually exacerbated by sport and relieved by rest. The pain can be referred to the knee, thigh, or low back. Other symptoms may include weakness, instability, and limping. Physical examination may reveal a decreased range of motion, a positive Trendelenburg test, and a positive impingement sign. Imaging studies, such as magnetic resonance imaging (MRI) or computed tomography (CT), may be necessary to confirm the diagnosis.
always played regular sport. The condition may even present in very sporty teenagers. The usual sports are rugby, hockey, martial arts and tennis, as they all involve twisting in deep flexion under load. The main complaint is usually of an insidious onset, activity-dependent groin pain with a loss of top-level sporting function. They may have had recurrent ‘groin strains’ or be aware of stiffness in the hip. Some report ‘pops’ or ‘clicks’ from the hip or catching when rising from a seated position. Some patients will present with symptoms severe enough to affect their activities of daily living. Often the patient will have had symptoms for a number of years and have seen several healthcare professionals before the definitive diagnosis is made.6

DIAGNOSIS
Reaching an appropriate diagnosis when assessing the young adult with hip pain requires a detailed history, clinical examination and appropriate imaging investigations.

History
The most common presentation of FAI is activity-related groin pain.7 Patients will often demonstrate the location of the pain by using the C-sign (Figure 2). Pain can be felt in the lateral hip, buttock, anterior thigh or lower back. Any history of childhood hip problems, such as Perthes’ disease or slipped upper femoral epiphysis, should be sought as well as any history of trauma.6 An understanding of the patient’s previous sporting activities as well as future aspirations is key.

Examination
Examination of the hip joint serves to determine if pain is being generated from a problem inside the hip joint itself. It also helps to exclude other potential causes of groin pain, such as an inguinal hernia. Examination should assess and compare range of motion in both hips. FAI is often associated with a reduced range of internal rotation of the hip, best assessed with the hip flexed to 90°. There are a number of clinical tests to help detect signs of FAI, the most commonly used of which is probably the flexion adduction internal rotation (FADIR) or impingement test. This involves flexing the hip to 90°, combined with gentle adduction then internal rotation (Figure 3). For the test to be considered positive, it should reproduce the patient’s typical pain. The test is sensitive but not specific, as it will also be positive in patients with osteoarthritis or synovitis.8 The patient’s lumbar spine and gait should also be assessed.

IMAGING
Plain radiographs are the first-line investigation and may demonstrate cam and pincer morphology, as well as being a useful screening tool to exclude other diagnoses, such as dysplasia or well established osteoarthritis.9 Anterior-posterior pelvis and cross-table lateral of the affected hip are the standard projections, although these may miss or underestimate cam morphology as it is commonly an antero-superior phenomenon. Other specialised projections may better demonstrate cam morphology.10

MRI scanning is essential to exclude other hip conditions, such as avascular necrosis, stress fractures, and psoas and glutal tendinopathy. MRI scans may or may not show injury to the cartilage or labrum, but sensitivity is improving with modern 3-Tesla MRI scanners. MR arthrography is not necessary and should no longer be performed for investigation of FAI. It is a painful investigation and, while it has a higher sensitivity for detecting labral tears, the decision to operate is a clinical one and should not be influenced by whether or not there is a labral tear on imaging. CT scanning with 3D reconstructions can provide excellent information on the bony anatomy to help plan surgery, and can be acquired much more quickly and with a much lower dose of radiation than in the past.12

TREATMENT
Conservative treatment
In common with most musculoskeletal complaints, an initial trial of conservative management is usually appropriate. This can include rest, activity modification with the avoidance of exacerbating movements, and non-steroidal anti-inflammatory
medications. Physiotherapy rehabilitation aims to improve hip stability, neuromuscular control, strength, range of motion and movement patterns. Physiotherapy involving stretching and education in techniques to avoid impingement-inducing movements has been shown to have some benefits.

Intra-articular injections of steroid and local anaesthetic have a role, both as a diagnostic and therapeutic tool. If the diagnosis is unclear, then an intra-articular injection can be helpful – if it provides pain relief, this is supportive of a diagnosis of FAI. Injections administered under ultrasound rather than traditional fluoroscopic guidance may be better tolerated by patients.

Surgery
Surgery is reserved for cases resistant to conservative management, and aims to address both the underlying bony abnormalities and any resultant tears to the labrum and cartilage damage. Traditional open surgery gains access to the hip joint via dislocation in such a way as to preserve the blood supply to the femoral head. Though often successful, this type of surgery is associated with relatively long inpatient stays and recovery periods, and has been almost entirely replaced with arthroscopic surgery.

Techniques in hip arthroscopy have rapidly developed to allow most cases of FAI to be treated using this much less invasive technique. Hip arthroscopy does, however, have a long, steep learning curve and is operator dependent; best results are obtained from specialist centres performing large volumes. At arthroscopy, removal of the impinging bone can be performed to correct abnormal morphologies and soft tissue injuries repaired including labral reattachment. Arthroscopic hip surgery can often be performed as a day-case procedure, requiring only a short postoperative period on crutches. Patients with desk-based jobs may be able to return to work within two weeks. Complication rates are generally decreased in arthroscopic surgery compared with open surgery. Between 1999 and 2009 there was an 18-fold increase in hip arthroscopy procedures performed in the USA.

Surgery for FAI often results in successful outcomes for patients; a recent systematic review found that 87% of athletes returned to sports after surgery, with 82% returning to the same sports level as before symptoms started. Given that FAI is felt to be a cause of osteoarthritis, it is possible that surgery to treat FAI may reduce the chances of a patient going on to develop osteoarthritis.

A 2014 Cochrane review found there was insufficient high-quality evidence to either support or discourage the use of surgery for FAI. There are a number of randomised controlled trials in progress which should provide appropriate high-quality evidence in the future.

CONCLUSION
FAI is a condition in which there has been a huge increase in understanding and interest in the past 15 years. Rapid developments in arthroscopic techniques mean surgery provides excellent results with low complication rates and a rapid return to activities, alongside the possibility of reducing the risk of future osteoarthritis.

An awareness of FAI among primary care and other frontline healthcare professionals should allow for early referral to orthopaedic care, to instigate appropriate investigation and prompt treatment.

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REFERENCES