

# Femoro-Acetabular Impingement

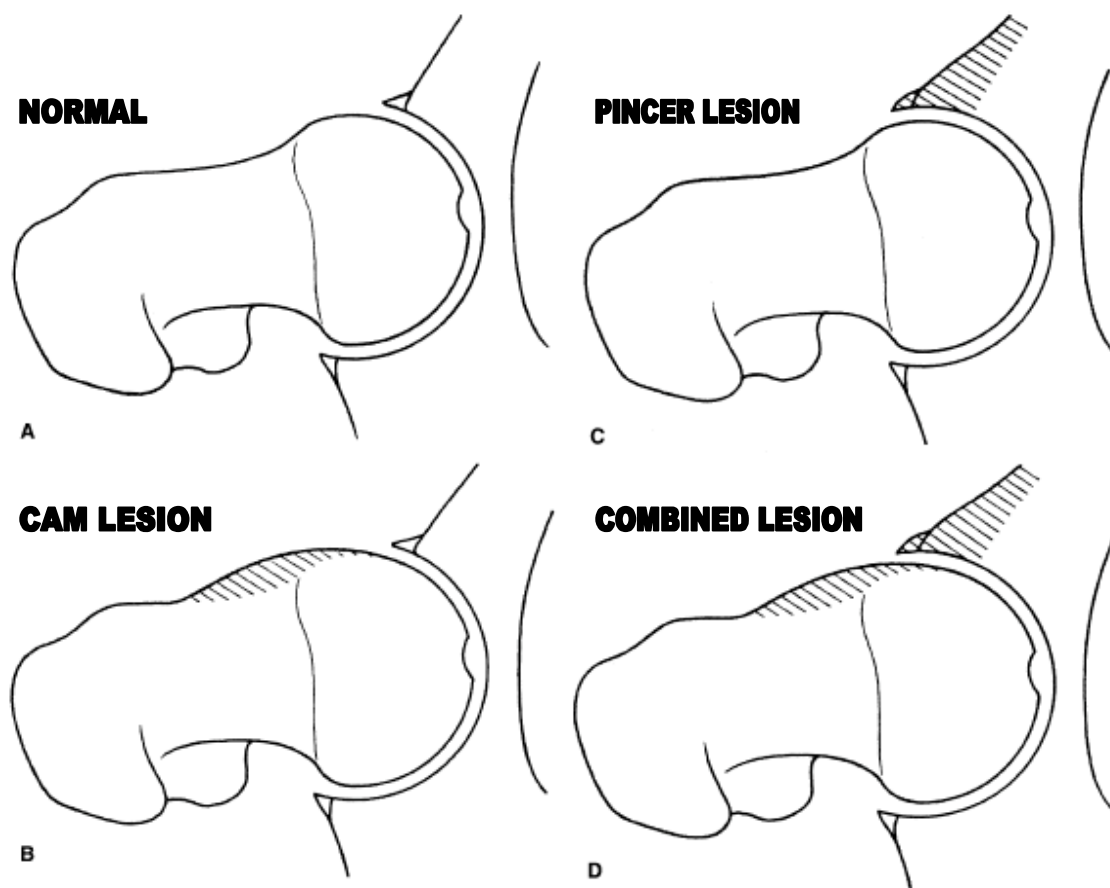
## Some Common Questions

### What is it?

Femoro-acetabular impingement or FAI is a condition of too much friction in the hip joint. Basically, the ball (femoral head) and socket (acetabulum) rub abnormally creating damage to the hip joint. The damage can occur to the articular cartilage (smooth white surface of the ball or socket) or the labral cartilage (soft tissue bumper of the socket).

FAI generally occurs as two forms: Cam and Pincer. The Cam form (Cam comes from the Dutch word meaning “cog”) describes the femoral head and neck relationship as aspherical or not perfectly round. This loss of roundness contributes to abnormal contact between the head and socket. The Pincer form (Pincer comes from the French word meaning “to pinch”) describes the situation where the socket or acetabulum has too much coverage of the ball or femoral head. This over-coverage typically exists along the front-top rim of the socket (acetabulum) and results in the labral cartilage being “pinched” between the rim of the socket and the anterior femoral head-neck junction. The Pincer form of the impingement is typically secondary to “retroversion”, a turning back of the socket, or “profunda”, a socket that is too deep. **Most of the time, the Cam and Pincer forms exist together.**

FAI is associated with cartilage damage, labral tears, early hip arthritis, hyperlaxity, sports hernias, and low back pain. **FAI is common in high level athletes, but also occurs in active individuals.**



**FIGURE 1.** The factors causing FAI are shown. The reduced clearance during joint motion leads to repetitive abutment between the proximal femur and the anterior acetabular rim. A, Normal clearance of the hip, (B) reduced femoral head and neck offset, (C) excessive over coverage of the femoral head by the acetabulum, and (D) combination of reduced head and neck offset and excessive anterior over coverage can be seen.

### **How is it diagnosed?**

The diagnosis can be straightforward or a diagnosis of exclusion. Most patients can be diagnosed with a good history, physical exam, and plain x-ray films. A patient's history will generally involve complaints of hip pain (front, side, or back) and loss of hip motion. The physical exam will generally confirm the patient's history and eliminate other causes of hip pain. The plain x-ray films are used to determine the shape of the ball and socket as well as assess the amount of joint space in the hip. Less joint space is generally associated with more arthritis.

Often an MRI of the hip is used to confirm a labral tear or damage to the joint surface. The MRI is most helpful in eliminating certain causes of non FAI hip pain including avascular necrosis (dead bone) and tumors.

### **What studies should my doctor order?**

In most cases, a Supine AP Pelvis view and a Hip Cross Table Lateral View are sufficient. The Pelvis view should be taken so that the coccyx projects 1.5 cm above the symphysis pubis. The Lateral view should be made with the lower extremity internally rotated 15 degrees. As the x-ray films are the most important part of the diagnosis, they should be no older than six months and of good quality.

An MRI should be ordered as a left or right hip study with intraarticular gadolinium (contrast dye in the joint) and a pain test. The pain test typically involves placing a local anesthetic inside the hip joint with the contrast dye. Using the pain test helps assess whether the pain is coming from inside the hip joint.

### **Can back pain be a sign of FAI?**

While the cause is not well understood, patients with FAI often complain of low back pain. This pain is often localized to the SI (sacroiliac joint on back of pelvis), the buttock, or greater trochanter (side of hip). FAI pain typically does not go beyond the level of the knee. This may be a result of limited hip motion because of FAI results in more force experienced by the lower back.

### **What other diagnoses might be confused with FAI?**

Lumbar Spine Pain (Low Back Pain)  
Lumbar Radiculopathy (Low Back Pinched Nerve, Low Back Facet Disease)  
Sacroiliitis (SI Pain/Dysfunction, back of pelvis)  
Trochanteric Bursitis (Outside Hip Pain)  
Piriformis Syndrome (Back of Hip Pain)  
Psychosomatic Pain Disorder (Stress Related Illness)  
Iliopsoas Tendonitis/Tendinosis (Hip Flexor Inflammation)  
Groin Pull  
Sports Hernia (abdominal muscle strain)  
Iliac Apophysitis (Front of Pelvis Pain)  
Quadriceps Hernia/Strain (Thigh Muscle Pull)

### **With what activities is FAI associated?**

#### Some common activities:

Ice Hockey	Bike Riding/Cycling
Horseback Riding	Deep squatting activities such as power lifting
Yoga	Rowing Sports (Kayaking, Sculling/Rowing)
Football (American)	Car riding (deep seated position)
Soccer	Rugby
Ballet/Dance/Acrobatics	Field Hockey
Golf	Lacrosse
Tennis	Figure Skating
Baseball	

### **Why does it occur?**

No one knows if FAI is a condition that begins at birth (congenital) or develops during periods of growth (acquired).

### **How did I get it?**

Some experts believe that significant athletic activity before skeletal maturity increases the risk of FAI, but no one truly knows. Significant contact sports (i.e., football) are associated with Cam impingement.

**Do I have arthritis if I have FAI?**

Both plain film x-rays and MRI scans are an incomplete view of the cartilage inside the hip joint. It is possible and common to have good joint space on plain x-ray films and no signs of arthritis on MRI and still have significant loss of cartilage within the hip.

**Do I have FAI if my hip MRI was read as “Normal”?**

At times, an MRI will be read as “Normal” but the clinical history, physical exam, and plain x-ray films indicate FAI. In this situation, further investigation with an arthroscopic surgery may be needed.

**What is an Alpha angle?**

The Alpha angle refers to a measurement taken of the hip ball (femoral head and neck junction) to determine how much Cam impingement exists. The larger the Alpha angle, the larger the Cam impingement lesion. The Alpha angle is most accurate when obtained from a special MRI scan that controls for hip rotation.

**My doctor recommended a CT scan of my hip to evaluate for FAI, should I follow this recommendation?**

A CT or CAT scan is often helpful in understanding the anatomy of the bones of the hip joint, but not essential to the diagnosis of FAI.

**My diagnosis was made after many years of hip pain, is that common?**

FAI as an identifiable condition is very new. Most physicians have heard of a hip labral tear but have never heard of FAI.

**I’ve been treated for a labral tear with a hip arthroscopy. Could I have FAI, too?**

Hip labral tears are associated with FAI. If you have had your labral tear treated and are still having pain, you may have residual FAI.

**Can my other hip be involved as well?**

Yes, it is possible for both hips to have FAI.

**I don’t have any pain, what should I do?**

Some patients with FAI complain of stiffness and loss of hip range of motion without any significant pain. Progressive loss of motion in the hip can be associated with ongoing FAI. Speak to your physician about your options.

**Is this the same condition as DDH (developmental dysplasia of the hip)?**

DDH or developmental dysplasia of the hip is a different diagnosis than FAI. DDH generally refers to too little coverage of the ball by the socket. FAI generally refers to too much coverage of the ball by the socket.

**My doctor says that FAI doesn’t exist, why?**

Currently, three different opinions exist regarding FAI. The first is that all hip problems are generally mild and should be managed with nonoperative choices such as injections, therapy or rest. The second is that hip problems often involve labral tears and that these tears can be treated by cutting out the torn tissue. The third is that hip problems often involve labral tears and that these tears are secondary to the labrum getting caught by the friction of the ball and socket—the condition of FAI. This third approach surgically treats the bone and soft tissue problems of FAI.

**What type of doctor can treat it?**

If one has a diagnosis of FAI or suspects FAI, one should be evaluated by an orthopaedic hip specialist. Your physician should have experience with either the open or arthroscopic approach.

**What are my treatment options?**

Nonoperative management of FAI is possible; however, it involves a change in lifestyle from active to less active.

Operative management of FAI can be addressed via an arthroscopic or open surgery. In arthroscopic hip surgery, the arthroscope is used to make an assessment of the hip joint and treat damage that is found through two to four small incisions. Often, all of the components of FAI such as the labral tear, damaged cartilage, and friction between the ball and socket can be treated through the arthroscope. Repair of a torn labrum as well as stimulating new cartilage growth

(microfracture) are often possible with the arthroscopic approach. Additionally, the underlying bony impingement can be addressed arthroscopically.

The open surgery involves an incision (approximately 10 inches) and surgical dislocation of the hip exposing all parts of the joint. This exposure allows treatment of labral tears and abnormal contact between the ball and socket.

Recovery time from most FAI surgical procedures is about 4 months. Your postoperative activity level will depend on your surgeon's recommendation.

### **What are the central and peripheral compartments of the hip?**

During a hip arthroscopy, the surgeon should visualize the two compartments or spaces of the hip joint. The first space is the central compartment. The central compartment is composed of the surfaces of the ball (femoral head) and the socket (acetabulum) as well as the soft tissues (i.e., labrum). Procedures performed within the central compartment include treatment of the cartilage and labrum. The peripheral compartment is the remainder of the hip joint and refers to the area along the junction of the femoral head (ball) and femoral neck. Procedures performed within the peripheral compartment include treatment of bone spurs and the joint capsule. Both the central and peripheral compartments are within the hip joint capsule making them accessible with the arthroscope.

### **What are the main risks of FAI treatment?**

Complications from FAI surgery are uncommon but include the following:

Deep Venous Thrombosis (blood clot)

Infection

Femoral neck fracture

AVN of the femoral head (dead bone)

Heterotopic ossification (abnormal bone formation in soft tissues)

Nerve injury (Sciatic, LFCN, Pudendal)

Nonunion (open surgical dislocation only)

Scarring/Adhesions

### **How long can I wait before seeking treatment?**

Typically, FAI that produces symptoms for at least 6 months should be evaluated for surgical treatment. A longer wait may compromise the cartilage of the hip.

### **Can I be treated with an injection of medicine or good physical therapy?**

Generally, FAI is a chronic condition that does not typically respond to hip injections or physical therapy over the long term – as it is primarily a mechanical problem that cannot be altered with these therapeutic modalities. That being said, a good physical therapy program focusing on hip strengthening instead of stretching may be beneficial. In fact, the stretching associated with yoga may make the symptoms worse. You may have periods of improved symptoms or even be symptom-free, but the underlying pathology is still there.

### **Can I just wait a few years and have a total hip replacement?**

Yes. The postoperative rehabilitation of a total hip replacement is significantly less than an FAI procedure; however, the lifespan of the replacement hip is shorter in younger patients.