Femoral-Acetabular Impingement
Ira Zaltz, M.D.
Oakland Orthopaedic Surgeons
Department of Orthopaedic Surgery
William Beaumont Hospital
Royal Oak, Michigan

Definition: Femoral Acetabular Impingement
Femoral acetabular impingement is sometimes referred to as FAI or simply Impingement. The hip joint is a ball-and-socket joint. The socket, or acetabulum, is part of the pelvis. A specialized cartilage structure, the labrum, surrounds the opening of the hip socket and is joined seamlessly to the cartilage lining the hip socket. The femoral head is attached to the upper end of the thigh bone, or femur, by the neck of the femur.

Femoral acetabular impingement is the abnormal contact between the head or neck of the femur and the rim of the acetabulum. Femoral acetabular impingement has many causes including abnormalities in the shape and orientation of the acetabulum, and abnormalities in the shape and orientation of the femoral head and neck. Other conditions such as slipped capital femoral epiphysis (SCFE); Legg-Perthes disease, osteochondromatosis, and prior treatment for hip dysplasia can also lead to femoral acetabular impingement.

Impingement between the head or neck of the femur and the rim of the acetabulum exposes the rim of the acetabulum to tremendous forces that can tear or crush the labrum and cartilage of the acetabulum. Once the labrum or cartilage is damaged, progressive deterioration of the cartilage will lead to the degeneration of the hip joint and to arthritis. Femoral acetabular impingement is thought to be the most common cause of adult hip arthritis.

Symptoms: Femoral Acetabular Impingement and labral tears
Symptoms of femoral acetabular impingement depend upon the extent of associated damage to the hip joint. Symptoms can begin in the early teens, and are most common in younger adults from 20 to 50 years. Most patients experience pain that is felt in the groin, thigh, buttocks, or knee. Occasionally, the pain can be vague and involve the lower back, side of hip, or thigh. Mechanical hip problems such as clicking, locking, and snapping are also common in femoral acetabular impingement. Some patients also
report progressive loss of hip motion and difficulty performing activities such as crouching, squatting, prolonged sitting, walking, and sleeping in certain positions.

**Evaluation: Femoral Acetabular Impingement**

Patients with suspected impingement are evaluated thoroughly in order to understand the cause of pain and abnormal hip mechanics. After fully discussing the patients’ symptoms and performing a physical examination, specific pelvic and hip x-rays are taken to evaluate the shape, size, and orientation of the acetabulum, femoral head and neck. Any associated arthritis or narrowing of the joint space is noted. Most patients will require an MRI-arthrogram to evaluate the shape of the femoral head and neck and to evaluate the labral and articular cartilage of the hip. An MRI-arthrogram is a specialized MRI scan that involves injecting liquid into the hip joint prior to the MRI so that the cartilage structures within the hip joint can be outlined and more thoroughly evaluated. Increasingly, patients require ultrasound examinations in order to dynamically evaluate the motion of the hip and the shape of the neck of the femur. The examination, x-rays, and MRI-arthrogram will allow your physician to understand the underlying abnormality causing pain in the hip. Occasionally, an anesthetic arthrogram is necessary to confirm that the hip joint is the source of pain. This test is performed by injecting a short acting numbing medication (e.g. lidocaine) directly into the hip joint. If this temporarily relieves the patient’s pain, the diagnosis of femoral acetabular impingement is confirmed.

**Treatment: Femoral Acetabular Impingement**

Treatment for femoral acetabular impingement is necessary if the patient has pain or signs of deterioration of the labral or joint cartilage. The surgical options include:

- Hip arthroscopy
- Surgical Dislocation of the hip
- Periacetabular Osteotomy
- Combinations of the above procedures

The goal of surgical treatment for femoral acetabular impingement is to remove or repair any torn tissue, to restore the normal mechanics to the hip joint, and to prevent the progressive deterioration of the hip joint. This


usually involves removing bone from the head and neck of the femur, or the rim of the hip socket to eliminate the impingement and to improve mobility. Selection of the appropriate treatment is individualized depending primarily upon the findings in the examination, x-rays, and MRI-arthrogram.

*Hip arthroscopy* is a useful outpatient surgical technique that is applicable for selected patients with preserved hip motion, minimal anatomic abnormality, and a tear(s) of the labral or articular cartilage. During hip arthroscopy, the joint is placed in traction to enable the surgeon to insert telescopic instruments into the hip joint through multiple small incisions. These instruments are used to remove or repair loose cartilage and torn tissue. It is very difficult in some cases to thoroughly reshape the femur using only arthroscopy, and, as such, it has limited applications in specific types of femoral acetabular impingement.

*Surgical Dislocation* of the hip is a procedure designed to provide full access and visibility to the hip joint. By enabling safe dislocation of the femoral head from the acetabulum, damaged tissue can be repaired or removed from the hip socket. Further, the normal shape of the femoral head and neck can be restored by removing excess and abnormally shaped bone. Thus, reshaping the head and neck of the femur and removing damaged cartilage restores normal hip mechanics, decreases pain, and improves function. Periacetabular osteotomy is a procedure designed to reorient the acetabulum. It is occasionally necessary in the treatment of impingement when the acetabulum is shallow or significantly out of alignment.

**Frequently Asked Questions: Femoral Acetabular Impingement**

**Will I need a blood transfusion?**
No. There is very little blood lost during this procedure, and pre-donation is not necessary.

**How long will I stay in the hospital?**
Most patients stay one or two nights in the hospital.

**What is specifically involved in the procedure?**
Patients can have either general or spinal anesthesia. During surgery patients are positioned on their side. An incision is made on the upper thigh and buttock region. The muscles of the thigh and buttock are detached by
cutting through a portion of the upper femur known as the greater trochanter that serves as the attachment of these muscles. At the conclusion of the procedure, the trochanter is reattached with two screws. No muscles are cut during a surgical dislocation. Once the hip is dislocated the excess bone and damaged tissues are removed.

**What is a femoral neck plasty?**
A femoral neck plasty is removing excess bone from around the neck and head of the femur. This allows the surgeon to reshape the upper end of the thigh bone which helps to eliminate impingement.

**What is a labral advancement?**
Labral advancement is used when it is necessary to remove part of the rim of the hip socket. This may be necessary to completely eliminate impingement or in cases of severe damage to the cartilage around the rim of the hip socket.

**What will I use for pain medicine?**
Patients use a combination of oral narcotic and anti-inflammatory medication occasionally supplemented with intravenous narcotics. Most patients use oral pain medicine for one or two weeks following surgery.

**Will I have physical therapy?**
While in the hospital you will be instructed in the use of crutches and in basic exercises to help you regain your hip mobility. Outpatient physical therapy starts after discharge and will help to further restore hip mobility and strength. Riding a stationary bicycle with no resistance helps to restore hip motion. Crutches are necessary for approximately 6 weeks following the procedure.

**What are the risks of surgery?**
*Avascular necrosis* is loss of blood supply to the head of the femur leading to death of the bone. This is a theoretical risk, and not known to occur as the technique of dislocation is designed to protect the blood supply to the hip.
Infection can occur with any surgical procedure. To decrease the already low likelihood of this problem, intravenous antibiotics are routinely used for 24 hours.

Nonunion of the greater trochanter is very rare. This can occur if the screws do not adequately hold the bone in place or if the patient is excessively active. If the nonunion is painful, further surgery will be necessary.

Heterotopic ossification is the formation of bone within muscles following either surgery or trauma. In advanced cases, heterotopic ossification can lead to loss of hip motion. Since no muscles are cut during surgical dislocation and great care is taken in the retraction of muscles, this complication is rare. Specific patients with risk factors for heterotopic ossification are prescribed preventive medication following surgery.

Deep Vein Thrombosis (DVT) is the formation of blood clots within lower extremity veins. These clots are potentially dangerous if they dislodge and obstruct blood flow to the lungs. DVT can occur in adults undergoing lower extremity orthopaedic surgery. Consequently, adults are prescribed blood thinners for several weeks following surgery in order to prevent the occurrence of DVT.

What do I do at home after discharge?
First 6 weeks: Use crutches as directed, perform prescribed exercises, take blood thinners, and use pain medicine as needed. You may be sent home with a CPM (continuous passive motion) machine. You will need assistance at home for the first week to help prepare food, dress, drive and other activities.

Second 6 weeks: Wean from crutches, advance physical therapy, and begin strengthening the hip muscles. Transitioning to full weight bearing can often take several weeks.

3 months: Begin sports activity slowly over 2 to 3 months, and continue to strengthen hip muscles.

6 months: Return to full activities. Sometimes you are advised to not run or jump if there was significant preexisting hip arthritis.
**When can I drive?**
Driving depends upon which hip has had surgery. Left hip patients may drive as soon as they are no longer using narcotics, and right hip patients may drive when they have regained sufficient strength and muscle coordination, usually 3 or 4 weeks.

**When are my follow up appointments?**
You will return to the office 2 weeks, 6 weeks, 3 months, and 6 months following surgery, or any time if there are problems or concerns.

**When can I return to work/school?**
Patients who have a sitting occupation or attend school may return whenever they can comfortably sit for sufficient time. Usually patients begin returning to work or school 4 weeks following surgery. Patients who are required to stand at work may not be able to return to work for 2 or 3 months.