



Hughston Health Alert

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Hip Resurfacing

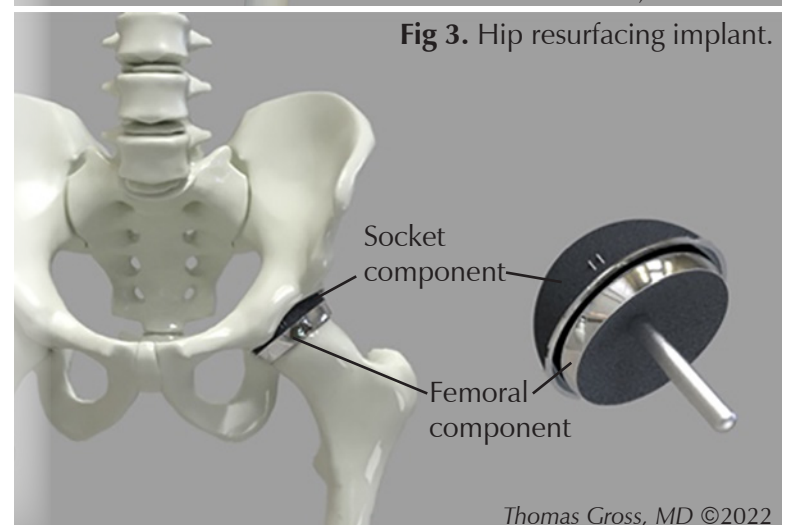
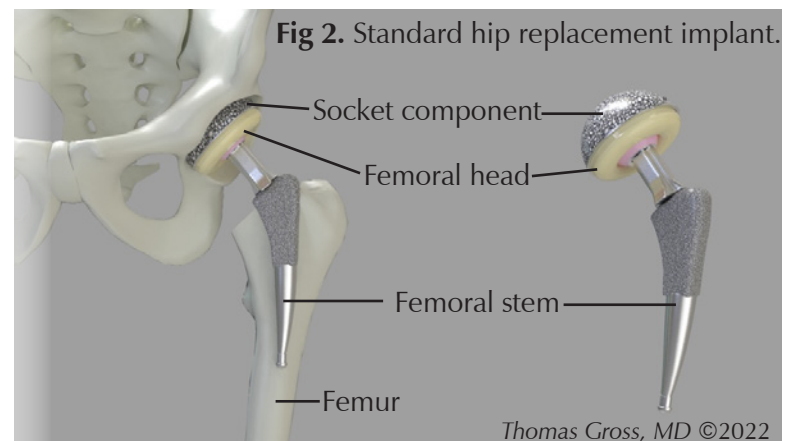
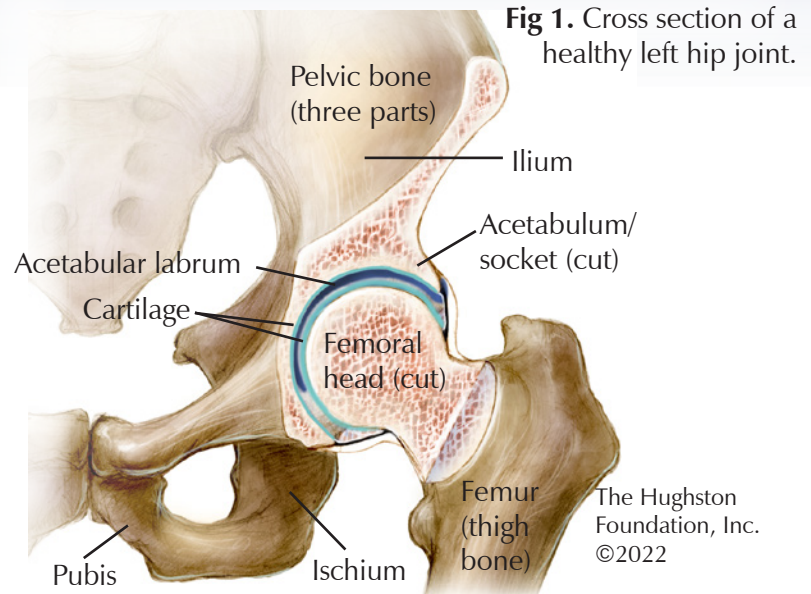
AN ALTERNATIVE TO TOTAL HIP REPLACEMENT

Hip resurfacing is a replacement procedure that allows surgeons to restore hip function and relieve pain using a more conservative approach than total hip replacement. The basic cause of hip pain is osteoarthritis, which is a degenerative disease that wears away the cartilage at the end of the bones. As this cartilage wears away, the bone-on-bone movement causes pain and swelling, which affects your ability to perform daily activities such as walking, completing an exercise regime, or playing a sport.

The hip is a ball and socket joint (**Fig. 1**). The head of the femur (the ball) and the acetabulum (the socket) form the hip joint. The acetabulum is shaped by the combination of 3 bones within the pelvis: the ilium, the ischium, and the pubis. A thick layer of cartilage covers both the femoral head and the acetabulum so that the joint can handle the force that transfers across it during movement. Cartilage is the smooth tissue that covers the bones in a joint and allows the bones to move against each other with minimal friction. A ring of cartilage called the labrum also surrounds the joint and contributes to its stability.

With a standard hip replacement, surgeons remove the entire femoral head. A long stem is inserted into the femur to anchor a new femoral head and a new socket component is put in place (**Fig. 2** and **Box 1**). In a hip resurfacing procedure, a layer of bone is taken off the head of the femur and off the socket and those surfaces are replaced with 2 metal surfaces. (**Fig. 3**)

Surgeons initially developed hip resurfacing for younger patients who were athletes or heavy laborers because these patients typically place greater and prolonged stresses on the hip prostheses; therefore, a standard total hip replacement would not last as long for them. Now with



Box 1. Standard Total Hip Replacement

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- Extensive femoral bone removal.
- Smaller bearing size.
- Loading of femur through a large stem.
- Bone ingrowth porous surfaces.
- Suitable for the elderly for activities of daily living and light sports like golf and pickleball.

improved surgical techniques, more patients are good candidates for a resurfacing procedure if they choose. Hip resurfacing has advantages that make it a good choice for some patients; however, it has disadvantages that you must also consider as well.

Advantages

The primary advantages of hip resurfacing are stability, functionality, durability, and bone preservation (**Box 2**). A hip resurfacing procedure leaves you with more of your natural bone, which is mechanically more like a normal hip and therefore less likely to dislocate. The dislocation rate is 0.3% compared to 3% for total hip replacement. A resurfacing is a super functional hip because patients are not limited by femoral stem pain. About 30% of total hip replacement patients have some discomfort from the stem with normal daily activities. This discomfort can become an impediment for heavy lifting or impact activities for patients. Hip resurfacing patients, on the other hand, can participate in vigorous athletics including karate, singles tennis, and running marathons without any fear of stem limitations.

Hip resurfacing is durable. Typical implant survivorship (how long the implant will last) in all patient groups is 99% at 15 years and this is with a much higher activity level. Standard total hip replacements have lower durability—95% with a 10-year implant survivorship for 70-year-olds and it is lower for younger patients. Since much less bone is removed with hip resurfacing compared to a total hip replacement, in the event of failure, more bone remains for a revision surgery.

Disadvantages

Two primary disadvantages of hip resurfacing have been femoral neck fractures and adverse metal wear failures. Orthopaedic surgeons have worked hard to minimize these risks and have practically eliminated them, but the risks still exist. To prevent fractures, surgeons look at the bone density of the femoral neck with a Dual-Energy X-ray Absorptiometry (DEXA) scan that measures bone density to determine the rate of recovery based on those results. If the bone is strong, rapid recovery often occurs. Patients with weaker bones will use crutches and a cane for a total of 10 weeks and take bone-strengthening medications. Surgeons instruct all patients to avoid extreme bending, heavy lifting,

Box 2. Hip Resurfacing

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- Thin metal bearings requiring minimal bone removal and preserving the entire femoral head.
- Normal stability and natural loading of the femur.
- Bone ingrowth porous surfaces.
- Technically difficult to implant.
- Suitable for athletes and heavy laborers.

running, and jumping for 6 months after the procedure to allow complete healing. If you follow the protocol, the fracture risk within 6 months is only 0.2%, which is well below the fracture risk of total hip replacement.

To avoid metal wear failures, surgeons use well-designed implants and specific guidelines for proper angle placement of the socket component. If the socket placement is too steep, the bearing (metal components) may wear abnormally and release large quantities of wear debris resulting in pain and swelling. If the socket is set correctly within the safe zone that the surgeon has established, wear is much lower. Significant corrosion does not occur with resurfacing and there is no type of total hip replacement that can match the low overall 15 year failure rate of hip resurfacing (1% at 15 years) in patients less than age 50.

Technological advances

Over the past 15 years, technology has changed dramatically allowing surgeons to perform hip resurfacing with minimal blood loss and good pain control. Surgeons can often perform the procedure in an outpatient surgery center, which means patients do not have to stay overnight in a hospital. Surgeons can use a number of non-narcotic means for pain management to minimize the amount of narcotics needed by patients. Typically, with good bone density, a patient can put full weight on their operative leg with crutches or a walker the day of surgery. After a week, the patient can progress to a cane and begin a daily walking program. Often, at 6 weeks, the patient can walk a mile without an assistive device and start performing light aerobic activities. At 6 months, patients can participate in full impact activities.

An alternative worth considering

Unfortunately, hip resurfacing is not commonly done. It is a more difficult, more complicated operation than a standard total hip replacement. In the hands of a surgeon experienced in this technique, however, hip resurfacing is worth considering as an alternative to total hip replacement. Talk to your doctor about which procedure fits your lifestyle and which will resolve the hip pain you are experiencing.

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Recovery and Rehabilitation after Hip Resurfacing

Recovery and rehabilitation after hip resurfacing surgery is divided into 2 phases. Phase 1 starts the day of surgery and lasts for 6 weeks and Phase 2 begins after 6 weeks postsurgery. There is not a lot of formal physical therapy necessary after a hip resurfacing. One to 2 sessions are important on the day of surgery or the day after surgery to ensure safety with walking with crutches or a walker, and patient and caregiver understanding of the exercises, walking program and positioning precautions, especially when standing up, sitting down and getting in and out of a car. Typically, physicians do not prescribe home physical therapy or outpatient therapy in Phase 1. In Phase 2, your physician may recommend outpatient physical therapy if you need more guidance with the advanced exercises or if you are having problems with returning to activities.

Phase 1: An emphasis on protection and healing

Patients should have a “less is more” attitude and not overdo it. Phase 1 soft tissue healing precautions include not bending over to pick something up off the floor or bringing your knee close to your chest (avoiding hip flexion greater than 90 degrees), not letting your leg turn inward (avoiding hip internal rotation) and only crossing your legs at your ankles when your knees are straight. You can lift and move your leg for function such as taking your leg on and off your bed, or in and out of a car, but you should avoid straight leg raises for exercise during this phase. Hip resurfacing patients can sleep in whatever position is comfortable. You can use pillows for comfort when sleeping on either side but they are not required for stability.

Based on your bone density test, your physician will recommend a fast or slow recovery program. A patient’s bone density will determine weightbearing, how long assistive devices will be used, and the amount of ambulation allowed. Most patients follow the fast program, which means they use 2 crutches or a walker the first week and put weight on the leg as tolerated. During weeks 2 and 3, patients can progress to 1 crutch or a cane, and at week 4, walk without an assistive device.

During week 1, your walking is limited to only what is necessary. This means no walking for exercise, and no roaming or wandering around the house unnecessarily. A daily home walking program starts at week 2, and is a continuous walk each day on a hard level surface. Patients should increase their distance gradually, with the goal of walking 1 mile at weeks 5 to 6. Recommended guidelines are ¼-mile week 2, ½-mile week 3, ¾-mile week 4, and 1-mile during weeks 5 to 6. This regimen

Fig. 1 Examples of Phase 1 exercises include:

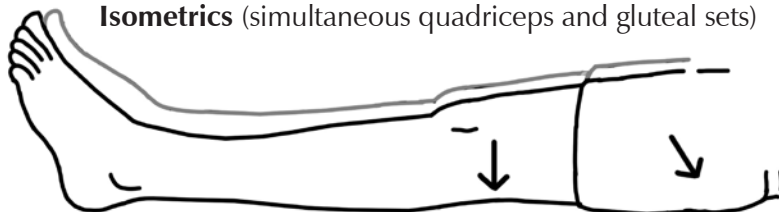
Ankle Pumps (both legs)



Position: Lying on your back on your bed or while sitting, legs straight.

Action: Bend your feet up and down at your ankles. Move through the full range of motion for blood circulation.

Isometrics (simultaneous quadriceps and gluteal sets)

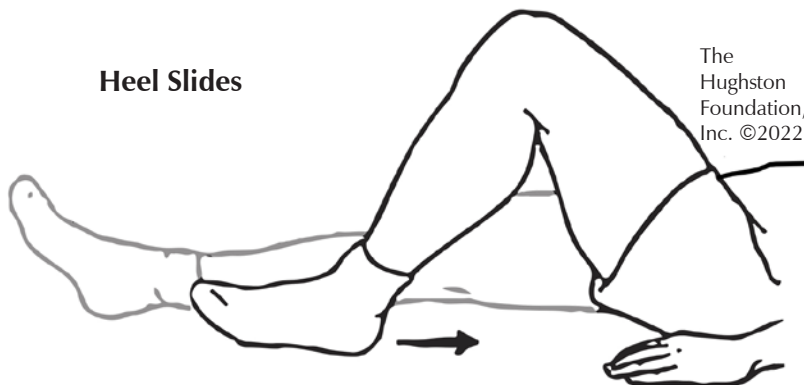


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Position: Lying on your back on your bed or while sitting, legs straight

Action: Tighten your thigh muscles by pressing your knees flat and squeeze your buttocks muscles together. Hold 5 seconds. Relax. Repeat.

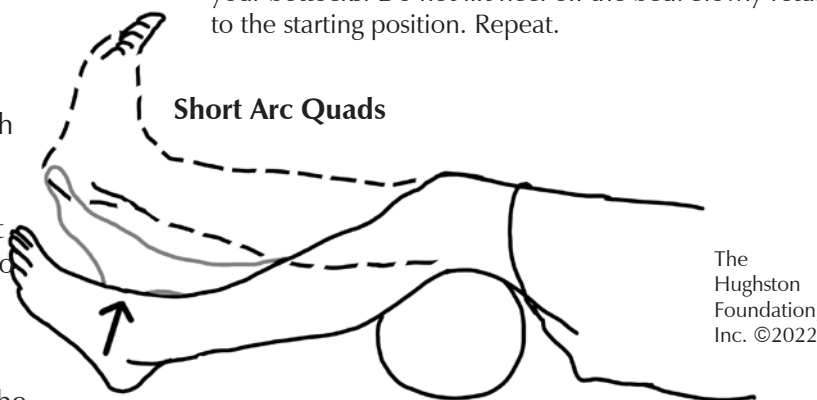
Heel Slides



Position: Lying flat on your bed, legs straight.

Action: Gently slide your operative side heel towards your buttocks. Do not lift heel off the bed. Slowly return to the starting position. Repeat.

Short Arc Quads



Position: Lying flat on your bed, operative side knee resting on a 3 to 4 inch roll.

Action: Lift heel off bed straightening knee. Keep knee on the roll. Hold 5 seconds. Slowly lower. Relax. Repeat.

allows for progressive loading of the new hip and bony ingrowth of the hip resurfacing implants. It is very important for patients to be compliant with their walking program, as they will not recover better or faster by walking more than a mile during Phase 1.

Phase 1 exercises (**Fig. 1**) include ankle pumps for blood circulation, isometric muscle squeezes of the quadriceps and gluteal muscles, heel slides for range of motion, and short arc quads to keep the quadriceps muscles engaged.

You can do arm exercises at 3 weeks while sitting and your resistance should be limited to what you can lift with just your arms. Mini abdominal crunches can begin at week 3 lying on a bed, but no full sit-ups, pushups, bridges or planks for 6 weeks. At 4 weeks, and only if your incision is completely healed, you can begin swimming using all strokes, but no flip turns. You should avoid flip turns during the first 6 months.

Phase 2: Gradual progression

After 6 weeks, patients enter Phase 2. There are no more positioning precautions, but patients should avoid deep squatting (buttocks below knees) and extreme stretching. Phase 2 stretches include adductor muscle stretching while lying down and sitting, quadriceps muscle stretching while standing and lying down, and psoas muscle stretching while standing. Strengthening exercises consist of straight leg raises lying down, hip abduction lying on your side, and double leg squats (**Fig. 2**). At 6 months, patients should start single leg squats and strengthen the small hip external rotator muscles sitting on the edge of a bed or table using a resistance band or an ankle weight.

If you are in the fast recovery program, you can progress your walking distance and start gym workouts, but avoid lifting more than 50 pounds with your operative leg for 6 months. You can now ride a stationary bike, use a stair-stepper, or elliptical, but no outdoor biking for 6 months. If you are in a slower recovery program, your physician will provide a progressive program to fit your needs.

Long-term recovery

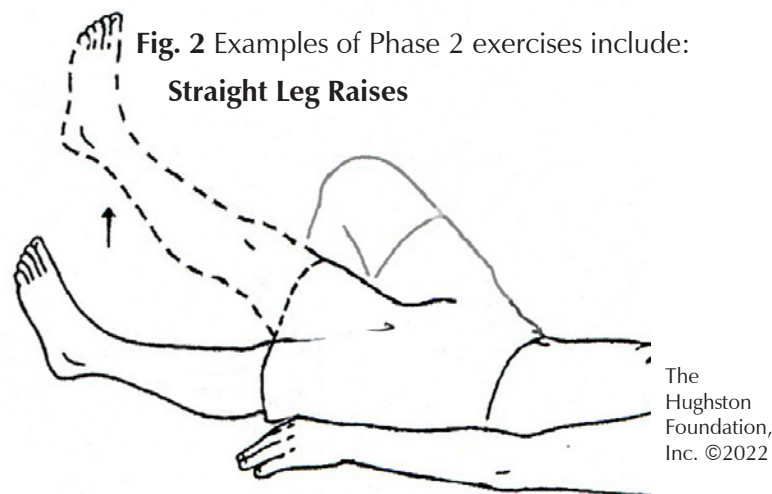
What can hip resurfacing patients expect for long-term recovery? You will regain full normal motion in your hip compared to your other hip with the exception of lacking 10 degrees of hip flexion (the motion of bringing your knee to your chest). You will be able to return to running 2 to 3 miles comfortably and some patients can return to longer distances including marathons and triathlons. You can return to all impact sports including tennis and ice hockey.

The big picture

Here is the big picture: the first 6 weeks you need to protect your resurfaced hip. Think, “Slow and steady

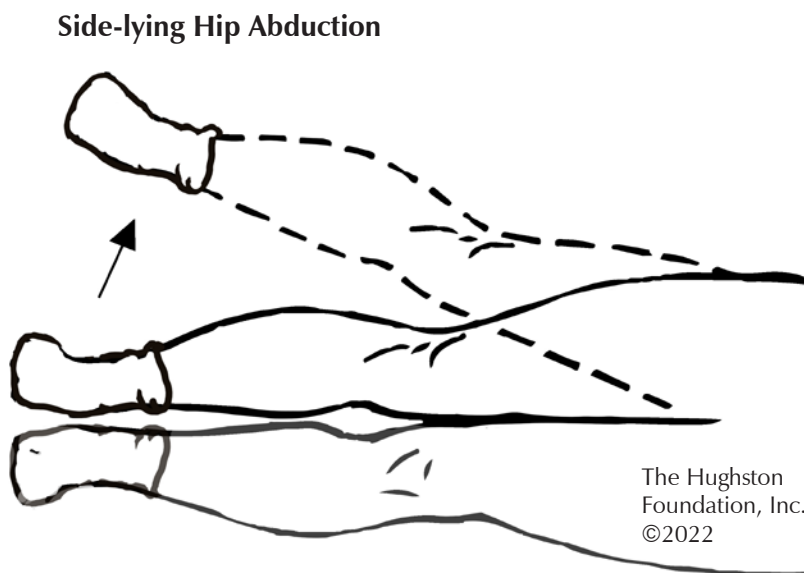
wins the race.” From 6 weeks to 6 months, you are progressing back to activities but still limited. At 6 months, you can “beat it up” and start impact activities including running and unlimited stretching and range of motion activities such as yoga. For 1 year, you should avoid extreme activities such as slide tackling in soccer, full splits, combat martial arts, and double black diamond skiing. It takes patience and discipline to comply with a hip resurfacing recovery protocol; however, the end-result is well worth it!

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Position: Lying on your back with operative leg straight and opposite knee bent.

Action: Keep knee straight and toes pointed to the ceiling. Lift leg up to 45 degrees. Hold 5 seconds. Slowly lower. Relax. Repeat.



Position: Lying on your nonoperative side, both legs straight.

Action: Keep knee straight and operative hip pointing up towards the ceiling. Lift leg up to 45 degrees. Hold 5 seconds. Slowly lower. Relax. Repeat.

Hip Labral Tear

The hip joint is a ball and socket joint with a ring of cartilage that lines the socket portion of the joint called the labrum (**Fig. 1**). The labrum can be a pain generator in the hip if for whatever reason it becomes torn. The torn cartilage is called a hip labral tear. Diagnosing hip labral tears has increased in recent years due to the technological advancement in magnetic resonance imaging (MRI, a test that shows the bones, muscles, tendons, and ligaments) and arthroscopy (joint surgery using small incisions and a camera) that allows better visualization of the tear. Physicians often treat labral tears with conservative treatments such as rest, anti-inflammatory medication, and physical therapy, but you may need surgery if those methods do not help the pain. The pathology is common, with physicians diagnosing 22% to 55% of patients who complain of hip or groin pain with a labral tear.¹

Symptoms

Symptoms vary with some appearing suddenly, while others have a gradual onset. Patients who have a labral tear often complain of pain in the front of their hip or groin that radiates to their knee or buttock. The pain is often constant and dull and can become worse with activities such as walking, running, or prolonged sitting. In general, when patients experience pain with movement and range of motion, the pain is often sharp. You may also experience loss of range of motion, perceived instability, clicking, locking, catching, or giving way.

Risk Factors

Labral tears often present with some structural dysfunction, such as femoroacetabular impingement (FAI) or dysplasia (abnormal development or growth) (**Fig. 2**).

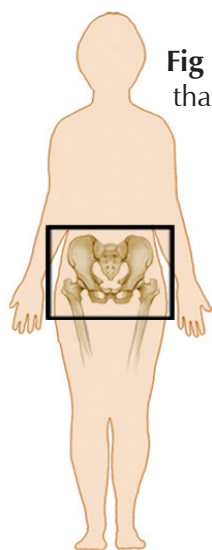


Fig 2. Hip joint structural abnormalities that are often present with labral tears.

Femoroacetabular impingement (FAI)

Combined
FAI

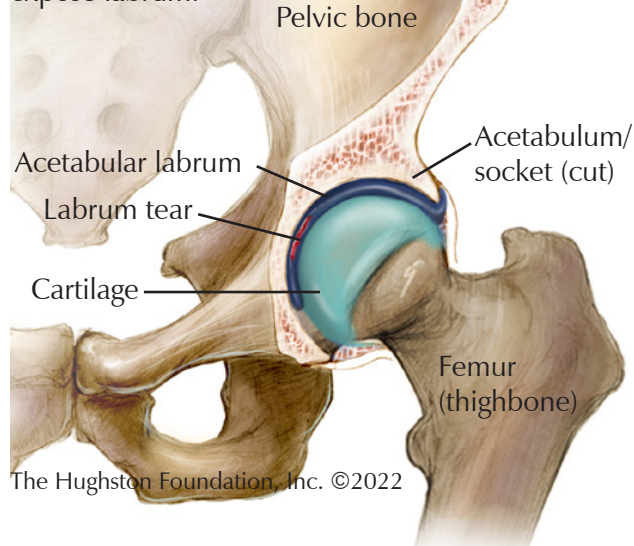
Pincer FAI

CAM FAI

Hip dysplasia (abnormal development or growth)

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Fig 1. Left hip shown with a cross section of the pelvic bone to expose labrum.



With FAI, the femoral head (ball portion) and neck rubs, or “impinges” on the acetabulum (socket part of the hip joint). FAI can be localized to the acetabulum, which is called Pincer FAI, or to the femur, which is called CAM FAI. It can also be due to abnormalities on both the femur and acetabulum, which is referred to as combined FAI. With dysplasia, the acetabulum does not fully cover the femur, causing increased pressure over the smaller area of the socket where the femur articulates. These conditions alter how the hip joint functions; as a result, physicians believe the labrum is more likely to tear.

Hip labral tears are more common in females rather than males and are typically in younger, active patients. Since hip labral tears are often associated with some sort of underlying structural dysfunction, the occurrence of a labral tear can coincide with the presence of articular cartilage damage or hip osteoarthritis. Therefore, an early diagnosis is key to prevent further damage to the joint.

Diagnosis

If you are experiencing continued hip pain, you should seek care from an orthopaedic specialist. When you visit the orthopaedist for hip pain, you should expect a thorough physical evaluation of your hips and lower extremities. The physician will move the hip through active and passive range of motion exercises and order x-rays or a MRI. Before the MRI begins, the radiologist may give you an injection of arthroscopic dye to help to visualize the soft tissue structures of the hip better.

Treatment

Depending on your symptoms and lifestyle, your physician can offer different treatment options. Conservative treatment can consist of rest, nonsteroidal anti-inflammatory medication, modification of activities, pain medication, physical therapy, or an intra-articular injection. Your doctor can prescribe any combination of these treatments concurrently. If conservative measures are not helpful in eradicating the pain, your doctor can recommend surgical treatment. There are multiple options for surgical treatment including labral debridement (removing the damaged part of the labrum), repair (reattaching the torn labrum to its origin), or reconstruction (where a graft is inserted in place of the torn labrum).² The surgical treatment chosen depends on the condition of the labrum. If there is an underlying cause of the labral tear, such as FAI or dysplasia, your surgeon can correct this during your labrum surgery.

Outcomes

Patients are often able to return to their prior activities after a hip labral procedure, with limitations in activities and range of motion after 4 to 6 months. Ninety-two percent of patients undergoing a labral repair procedure, report good to excellent results 3.5 years after the procedure.³ Keeping a positive attitude and adhering to your treatment and physical therapy protocols can help the recovery.

If you are experiencing hip pain that is not improving, you should seek medical care from an orthopaedic specialist. Early diagnosis is key to proper management and minimizing extended pain. It is important to discuss your symptoms and concerns with your provider in full transparency to come up with the best treatment regimen for your unique circumstances.

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Total Hip Replacements in Obese Patients

Researchers directly link obesity to earlier-age onset osteoarthritis, which may explain why obese patients tend to require total hip replacement on average 10 years earlier than non-obese individuals do. Total hip arthroplasty (THA or total hip replacement) in obese patients also poses unique challenges for surgeons. These patients often require more preoperative optimization, longer surgical time, and they tend to have a higher risk of complications, such as, infections, wound healing, and revision surgery. Despite the surgery being technically more difficult and with higher risks, functional outcomes for obese patients are comparable with patients who are at a non-obese weight.

Table 1. Body fat percentages		
Description	Men	Women
Essential fat	2-5%	10-13%
For athletes	6-13%	14-20%
For fitness	14-17%	21-24%
Acceptable	18-25%	25-31%
Obese	26%+	32% +

Calculating obesity

Body Mass Index (BMI) is a measure of the body’s fat content (Table 1.) based upon height and weight that applies to both adult men and women. Obesity levels can be determined from the BMI calculations (Table 2.). In addition to BMI, fat distribution can be measured using waist circumference (more than 35 inches in women and 40 inches in men) and waist-hip ratio.¹ These measuring techniques can help give a more accurate description of different types of obesities, such as abdominal or central obesity (fat stored around the waist) or peripheral obesity (fat stored around the hip and thigh area). BMI classification have established underweight below 18; normal ranges as 18-25; overweight 25-30; obese 30-35, and morbid obesity >35.

Table 2. BMI categories	
Underweight	below 18.5
Normal weight	18.5 – 24.9
Overweight	25 – 29.3
Obesity	30.0 & above

Clinical studies have shown that there are higher complications rates in obese patients undergoing hip replacements. Comparing outcomes of obese patients who underwent total hip arthroplasty or a knee replacement, there were more complications in the hip surgery groups with higher rates of wound complications and reoperation rates.¹ Hip surgery on obese patients can make every phase of the operation more difficult with respect to time and complexity. Their increased tissue mass can make exposure more difficult due to soft tissue limiting motion and the ability to manipulate the joint. This commonly presents issues with joint exposure and proper positioning of the hip replacement components.

Preparing for surgery

Working with obese and morbidly obese patients preoperatively is important to try to prepare them for surgery, optimize their risk, and set them up for a successful outcome. Any amount of weight loss prior to surgery can be helpful to lower their risk of an infection or other complications. For morbidly obese patients, this often involves a preoperative weight loss plan that includes healthcare providers in different fields, such as dietitians, primary care physicians, and sometimes, bariatric surgeons. Working with a physical therapist is also beneficial in the morbidly obese patient. Physical therapy can help strengthen surrounding hip and core muscles, provide gait training with assistance devices such as walkers or canes, and teach tips for seemingly simple activities that can be difficult after surgery, such as putting socks on or getting dressed. Furthermore, a discussion with your surgeon to decide on the best surgical approach for hip replacement for different types of obesity (i.e., central vs peripheral) is important. A patient's height and weight may be important clinical factors that can influence the best surgical approach to hip arthroplasty as well.

Posterior surgical approach

The posterior method is the most commonly used hip approach for primary and revision hip replacement because it offers excellent exposure of the joint and can more easily be converted if a problem were to arise such as an intraoperative fracture of the pelvis or femur. The excellent exposure comes from the surgical release of the thick posterior hip joint capsule and adjacent external rotator muscles on the posterior aspect of the hip capsule. The surgeon must repair the muscles at the conclusion of the surgery.

Lateral and anterolateral surgical approaches

The lateral and anterolateral surgical approaches also release muscles in order to expose the hip joint. The gluteus minimus and medius (hip abductor) muscles are released during exposure and repaired at the conclusion as well. This approach has less risk of postoperative hip dislocation compared to the more commonly use posterior approach,

but the violation of these hip abductors muscles (moves the leg away from the midline) can potentially lead to a postoperative limp.

Direct anterior surgical approach

The direct anterior approach (DAA) is a technique used in hip replacement surgery that is muscle sparing (**Fig.**). This means that the exposure follows natural tissue planes to the hip, moving muscles rather than cutting through them.² Since the direct anterior approach does not require the release of muscles to expose the hip joint, it means that surgeons do not have to make repairs to any muscles once the operation is complete.

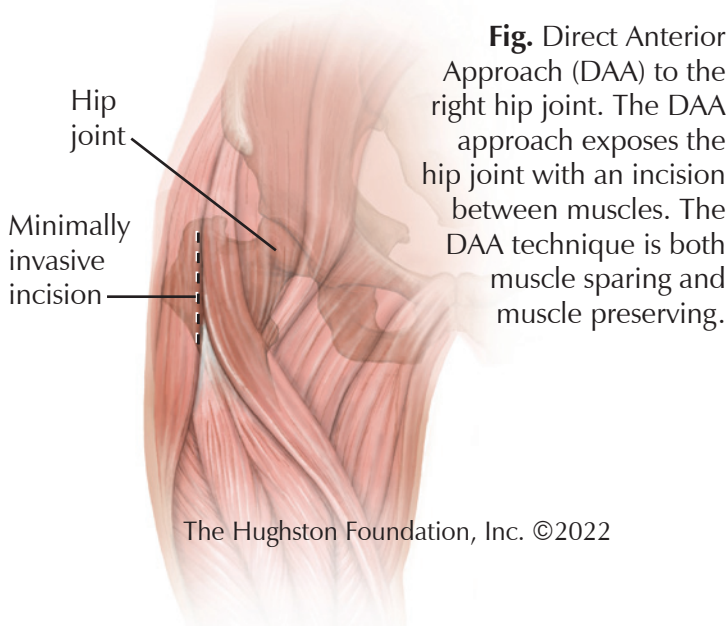


Fig. Direct Anterior Approach (DAA) to the right hip joint. The DAA approach exposes the hip joint with an incision between muscles. The DAA technique is both muscle sparing and muscle preserving.

Choosing a good surgical team

No matter what surgical approach you and your surgeon decide upon, either way, there is no short cut to a better quality of life. While all surgeries have inherent risks of complications, hip replacement as a whole, independent of the approach, has one of the highest satisfaction rates in all of orthopedic surgery. The most important factor is not the surgical approach, but the experience and reputation of your surgeon. An experienced doctor will ensure all modifiable risk factors are optimized prior to surgery so that each patient has the best chance for success.

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