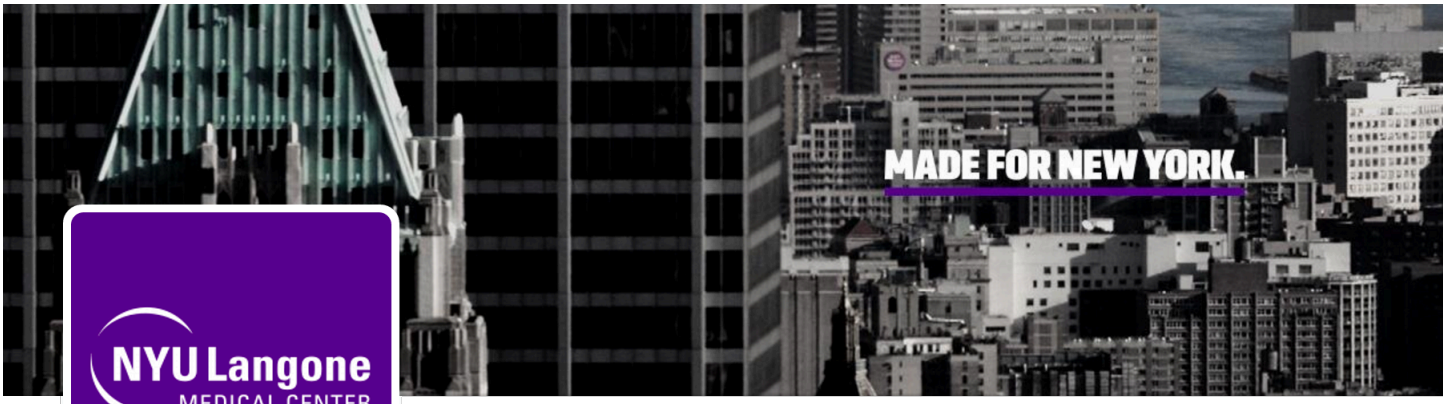

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Rehabilitation Guidelines for Hip Arthroscopy Procedures

The hip joint is composed of the femur (the thigh bone), and the acetabulum (the socket which is from the three pelvic bones). The hip joint is a ball and socket joint that not only allows flexion and extension, but also rotation of the thigh and leg. Unlike the shoulder, however, stability is not sacrificed for mobility. The head of the femur is encased by the socket, and with the addition of the strong, noncompliant joint capsule, the hip is an extremely stable joint. Because the hip is responsible for transmitting the weight of the upper body to the lower extremities, the joint is subjected to substantial forces. Walking transmits 1.3 to 5.8 times body weight through the joint, and running and jumping can generate forces across the joint equal to 6 to 8 times body weight. The labrum is a circular, fibrocartilaginous structure that surrounds the socket. It functions to seal the joint, enhance stability, and provide proprioceptive feedback (tells hip joint position) to the brain and central nervous system. The labrum acts as a suction seal or gasket for the hip joint. This helps to maintain the hydrostatic pressure that protects the articular cartilage on the head of the femur and the acetabulum.

The iliopsoas tendon connects the fibers of the psoas major and ililacus muscles to the proximal femur (lesser trochanter). Painful snapping of this tendon can occur during flexion and extension of the hip when the tendon pops over a bony prominence (iliopectineal eminence) that is located in the area of the anterior hip joint. The pain and snapping may be very similar to that which occurs with labral tears.

Hip joints of athletes are exposed to extremes of motion, and these forces are absorbed by and can injure the labrum. It is currently thought that the labrum may also be injured by impingement of the hip. This is referred to as femoroacetabular Impingement (FAI). FAI can occur from changes in the shape of the acetabulum or the femoral head and neck. FAI due to "over-coverage" of the acetabulum is referred to as pincer impingement. FAI due to a lack of the normal femoral head-neck off-set, or "lack of femoral head roundness", is referred to as cam impingement. Figure 2 demonstrates the boney abnormality associated with cam impingement of the right hip; note the difference in the shape of the femoral head. Often times, cam and pincer impingement can co-exist. When the normal convex on concave (or ball and socket)

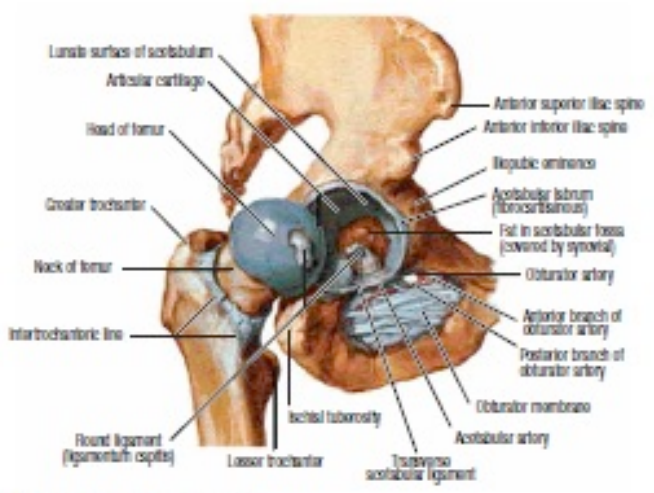

Figure 1 Hip joint (opened) lateral view

***Figure 2**: Frog leg radiograph: The thin arrow on your left indicates the area of "flattening" of the right femoral head and lack of the normal femoral head-neck offset. The thick arrow on the right indicates the more normal, rounded contour of the left femoral head.*

geometry is lost, impingement may occur as the hip is flexed toward its end range. This is often accentuated with adduction and internal rotation. Repetitive impingement can cause labral tears and delamination of the acetabular articular cartilage.

Labral tears may cause a sharp catching pain, popping, and a sensation of locking of the hip (mechanical symptoms). Most people with this injury experience more subtle, dull, activity-induced positional pain – especially if they have femoroacetabular impingement. They most often describe a deep discomfort in the anterior groin, and occasionally the pain may be directly lateral (greater trochanter area), or deep within the buttocks. Flaps from damaged articular cartilage may cause mechanical symptoms but most often they will cause pain during or after weight bearing and impact activities, such as running and jumping.

Non-operative treatment of painful labral tears usually is not successful. However, 25% of individuals over the age of 50 have labral tears seen on MRIs, but no symptoms. Thus, arthroscopic treatment of a labral tear is only indicated when appropriate clinical tests and imaging studies have documented that the hip pain is due to the labral tear. Labral tears can be treated by partial resection or repair. If indicated, labral repair is preferred as it attempts to restore the normal suction seal of the hip joint. If the tear is too small or the quality of the injured tissue is too poor, repairs are not performed. Both of these procedures can be done arthroscopically.

Hip arthroscopy is performed on an outpatient basis under general anesthesia. The hip to be operated upon is placed in traction to open up the hip joint enough to allow for the insertion of the instruments. After marking out the anatomical landmarks with X-ray guidance, three to four small incisions are made in the area of the hip joint. One of these incisions is used to insert a camera that displays the inside of the hip joint on a television monitor, and the other incisions are used to insert the surgical instruments used for excising labral tears, debriding defective cartilage, removing bone spurs, and removing loose bodies.

Hip arthroscopy is also used to treat the hip pain and mechanical symptoms caused by a number of other conditions including: loose bodies; iliopsoas snapping; hip instability; hip abductor muscle-tendon tears; chondral lesions; ligamentum teres tears; and femoroacetabular impingement (FAI).

When treating FAI, a burr is used to reshape the femoral head-neck offset. This is called a proximal femoral osteoplasty. The goal is to restore the normal convex on concave relationship (ball on socket) so that the hip can move through the full range of motion without impingement. To treat chondral lesions, a microfracture technique may be performed after the damaged articular cartilage is removed. This is done by creating small holes in the subchondral bone of the defect to promote the inflow of blood and stem cell in the hopes that these elements will lead to the growth of fibrocartilage to fill the chondral defect. Although the fibrocartilage is not as strong as the original hyaline cartilage, it does act to create continuity of the surface.

Figure 3: *T2 MR image showing abductor tendon tears (yellow arrows) at the greater trochanter of the femur.*

Using the arthroscopic instruments, the "peripheral hip joint" (the space outside of the socket part of the hip joint) can be visualized and thus, FAI can be arthroscopically treated. The "peritrochanteric" (greater trochanteric bursa) area of the hip joint also can be visualized, and this advance in hip arthroscopy has allowed for the repair of hip abductor (gluteus medius and minimus) tendon tears. Figure 3 shows an image of an abductor tendon tear. Suture anchors are placed in the greater tuberosity, and then the sutures are passed through the torn tendon and the tendons are re-approximated to their anatomic location on the femur. This is similar to a rotator cuff repair in the shoulder. In order to allow the tendon to heal back to the bone after this procedure, weight bearing and strengthening exercises will be more protected and limited in the first postoperative rehabilitation phase.

Iliopsoas tendon injuries are another source of anterior hip pain. Most often they are they are caused by an acute injury, and less commonly, the result of repetitive trauma. The iliopsoas can snap over the iliopectineal eminence and bursae (Figure 4). The painful snapping usually is audible and associated with a sensation of snapping and hip pain. However, anterior hip pain due to iliopsoas bursitis and tendonitis may occur without snapping of the tendon.

Rehabilitation Protocol After Hip Arthroscopy

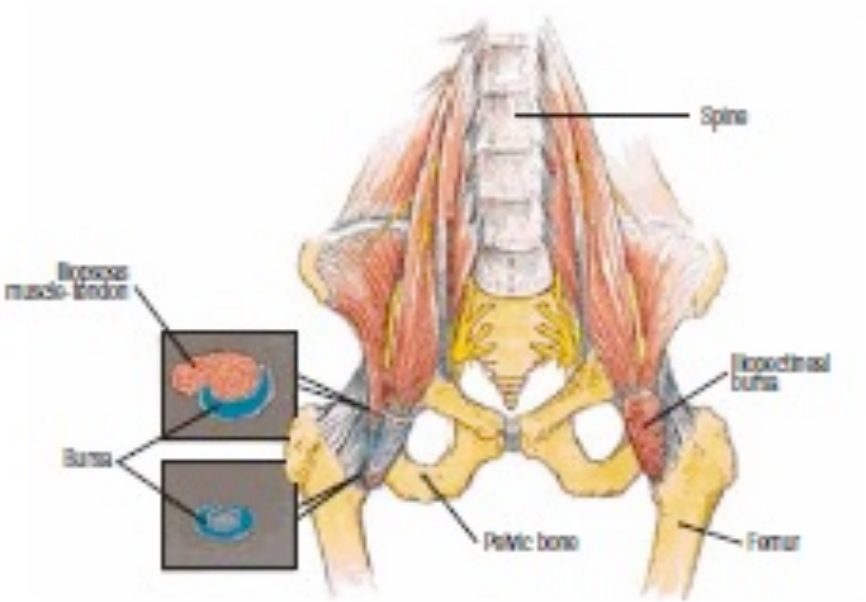

Figure 4. Diagram of the iliopsoas muscle-tendon and bursa

It should be noted that asymptomatic snapping is not uncommon in hypermobile athletes.

Non-operative treatment (physical therapy and psoas bursa injections) is successful in getting almost two thirds of patients with painful snapping hips back to full activity. When these measures fail, an arthroscopic release of the iliopsoas tendon often is performed and does provide long-term relief of the snapping and pain.

Rehabilitation of the hip begins the day after surgery. The rehabilitation guidelines are presented in a criterionbased progression, and each patient will progress at a different rate depending on the specific procedure performed, age, pre-injury health status, and rehab compliance. The patient may also have postoperative hip and thigh pain which can slow the recovery rate. This can be caused by traction on the hip during surgery. There may also be reflex inhibition and poor control of the muscles that stabilize the hip from the traction and from penetration of the hip joint with the arthroscopic instruments. It is very important to use crutches for the first week or two after surgery in order to minimize abnormal forces on the back and pelvic joints while developing muscle coordination and strength to support the hip and to achieve a normal gait pattern. This is especially important with iliopsoas tendon release, as hip flexors are significantly weakened for two to six weeks after surgery. All exercises should be performed within pain tolerance. Pushing to extremes of motion beyond pain tolerance does not enhance function but rather increases discomfort and prolongs rehabilitation.

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