PELVIS, HIP, AND THIGH INJURIES

54

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GENERAL PRINCIPLES

Overview

- Understanding of hip pathology has substantially improved recently owing to more specific clinical tests, better imaging diagnosis, and discovery of new entities.
- Hip pathologies include femoroacetabular impingement (FAI), borderline dysplasia, femoral version, hip instability, and femoral head deformities such as slipped capital femoral epiphysis (SCFE) and Perthes disease.
- Understanding hip anatomy, physiology, biomechanics, different pathologies, and treatment options is key to offering high-quality care to patients.

Bony Anatomy

Acetabulum

- The acetabular fossa constitutes the inferior portion of the acetabulum and is surrounded by the lunate surface in its superior and lateral aspects (Fig. 54.1).
- When performing hip arthroscopy, it is critical to understand the location of the pathology. To locate chondrolabral hip lesions more easily, the socket is considered a clock, wherein 12 o'clock represents the most superior aspect of the acetabulum, continuing anteriorly with successive hours. Unlike the knee, the 3 o'clock position is always anterior for both right and left hips.
- Several bony landmarks have been described to help the surgeon with an accurate location during arthroscopy:
  - The superior extent of the anterior labral sulcus (psoas-u) indicates the 3 o'clock position on the acetabular rim; anteriorly, it corresponds to the location of the iliopsoas tendon.
  - The stellate crease is located superior to the apex of the acetabular fossa and corresponds to the 12:30 position (see Fig. 54.1).
- The abduction angle of the acetabulum relative to the horizontal plane averages 45 degrees with 20 degrees of anteversion.

Femoral Head

- The femoral head forms roughly two-thirds of a sphere whose surface is completely articular except for the fovea capitis femoris where the ligamentum teres (ligament of the head of the femur) is attached (see Fig. 54.1).
- On an average, the neck shaft angle averages 130 degrees and the femoral neck is anteverted 14 degrees relative to the bicondylar axis at the knee.

Soft Tissue Anatomy

Labrum

- The labrum is a fibrocartilaginous structure attached to the acetabular rim.
- It is responsible for guaranteeing the suction seal, a key function in fluid dynamics, ensuring wider coverage of the femoral head and providing negative intra-articular pressure that provides stability to the hip joint.
- Labral pathology is normally observed in the anterosuperior area of the socket (12 to 2 o'clock position); this area correlates with the location where impingement normally occurs (Fig. 54.2).

Capsule

- The hip capsule is formed by the iliofemoral ligament anteriorly, the ischiofemoral ligament posteriorly, and the pubofemoral ligament inferiorly (see Fig. 54.1).
- Near the acetabular origin, the superior and superolateral aspect of the capsule is the thickest portion (3.7–4.0 mm) (Fig. 54.3).
- The capsule is inserted at a mean of 26.2 mm distal to the chondral head–neck junction of the proximal femur. The capsule has a spiral configuration that tightens in terminal extension and external rotation.

Muscles

Hip Abductors

- Gluteal group: Gluteal muscles include the gluteus maximus, gluteus medius, gluteus minimus, and tensor fasciae latae.
- The gluteus medius muscle stabilizes the hip and controls hip motion, particularly during weight bearing. Weakness or insufficiency of this muscle leads to the Trendelenburg gait.

Hip Adductors

- Adductor group: Adductor brevis, adductor longus, adductor magnus, pectineus, and gracilis muscles; the adductors originate on the pubis and insert on the medial, posterior surface of the femur, with the exception of the gracilis, which inserts distally on the pes anserine on the tibia. There is a pubic aponeurosis that is a confluence of the adductor and gracilis origins; it is also referred to as *rectus abdominis/adductor aponeurosis*. There is a clinical association between FAI and sports hernia and adductor tendinopathy, also known as *athletic pubalgia*.

Hip Flexors

- Iliopsoas group: Composed of the iliacus and psoas major muscles; the iliacus originates on the iliac fossa of the ilium and joins the psoas major muscle that runs from the lumbar bodies (2, 3, 4) and inserts distally into the lesser trochanter.
- The rectus femoris is a weaker flexor with the knee in extension. However, owing to its proximity to the capsule and its complex anatomy, it serves as an important differential diagnosis for hip pain.
- The direct head of the rectus femoris attachment has a shape of a "tear drop" occupying the entire footprint of the superior facet of the anterior inferior iliac spine (AIIS). The indirect head has a broad insertion over the rim (Fig. 54.4).

Hip Short External Rotators

- This group consists of the obturator externus and internus, the piriformis, the superior and inferior gemelli, and the quadratus femoris (see Fig. 54.4). The piriformis muscle originates in the anterior surface of the sacrum and inserts into the superior boundary of the greater trochanter; the gemellus superior goes from the ischial spine and joins the piriformis tendon in its insertion at the greater trochanter. The obturators (internus and externus) insert on the medial and lateral surface of the obturator membrane and then travel to the medial surface of the greater trochanter and the trochanteric fossa, respectively. The gemellus inferior muscle inserts on the superior aspect of the ischial tuberosity and inserts distally into the piriformis tendon (indirectly to the greater trochanter). Last, the quadratus

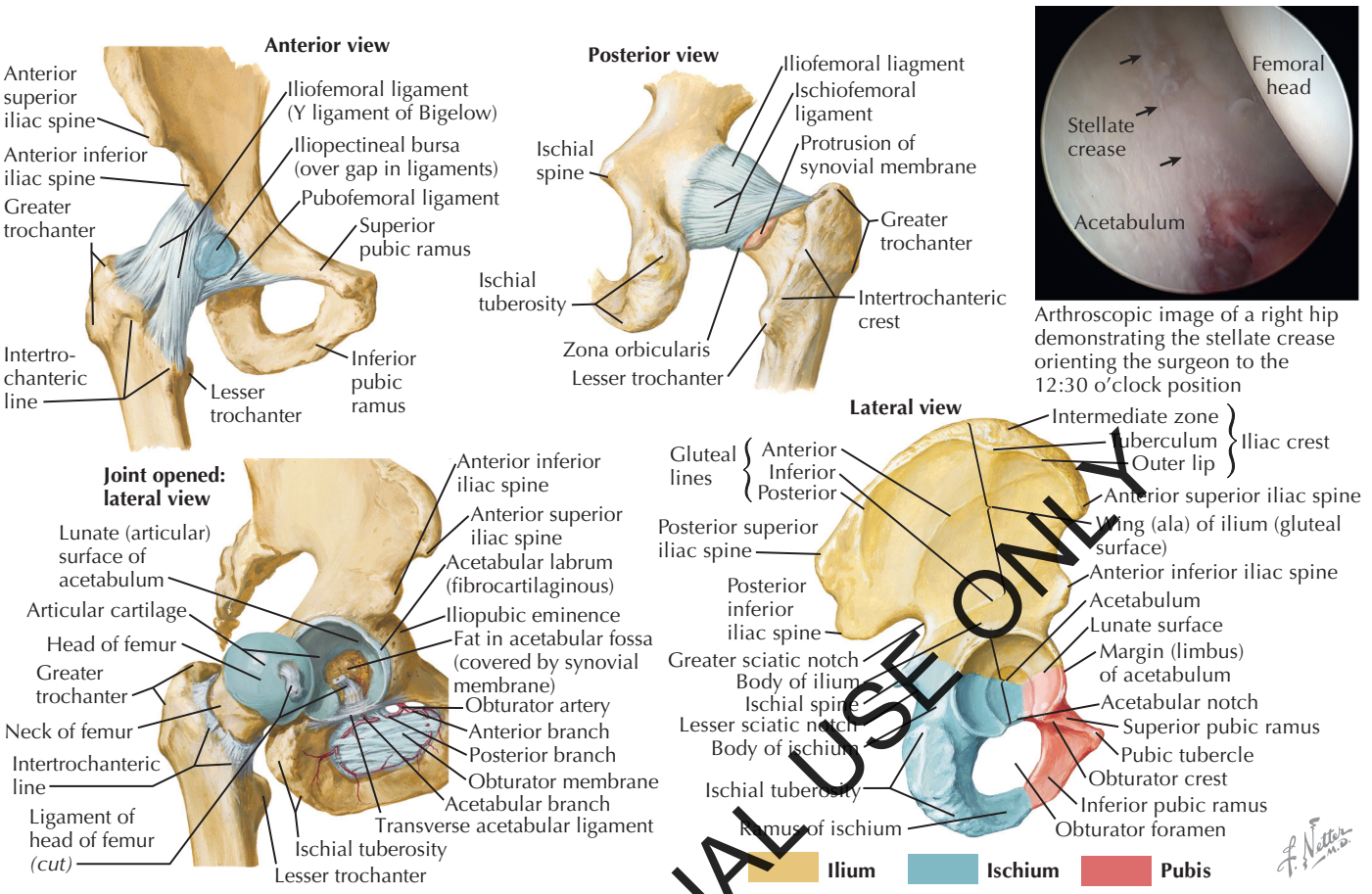


Figure 54.1. Bony anatomy of the hip.

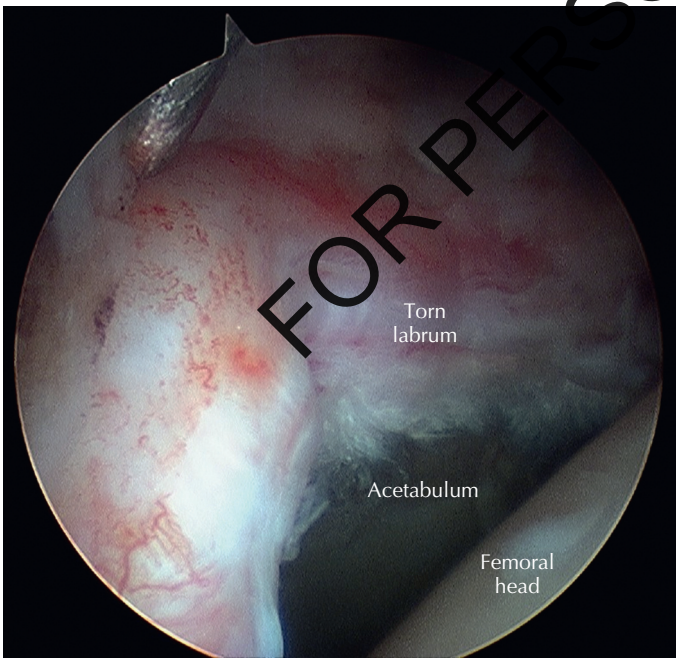


Figure 54.2. Arthroscopic image of a left hip demonstrating a tear in the superolateral aspect of the labrum. Note also the inflammation of the labrum confirming a pathologic process.

femoris muscle goes from the lateral edge of the ischial tuberosity to the intertrochanteric crest.

Neurovascular Structures

- The extracapsular arterial ring at the base of the femoral neck is formed posteriorly by a large branch of the medial femoral circumflex artery (MFCA) and anteriorly by smaller branches of the lateral femoral circumflex artery (LFCA). The superior and inferior gluteal arteries have minor contributions to the irrigation. Retinacular arteries and the internal ring arise from the ascending cervical branches. Finally, the artery of the ligamentum teres is derived from the obturator artery or the MFCA (Fig. 54.5).
- The blood supply to the femoral head is mainly from the deep branch (posterior) of the MFCA. During anterior controlled hip dislocation, this vessel is protected by the obturator externus muscle. The ligamentum teres branch, which is important during developmental phases of the femoral head, does not play an important role in the adult hip.
- The lower extremity receives its innervation from the lumbosacral plexus, which forms the sciatic, femoral, and obturator nerves as well as various smaller branches.
- The hip receives innervation from L2 to S1 nerve roots but principally from L3; this explains the presence of medial thigh pain often accompanying hip pathology because symptoms may be referred to the L3 dermatome.
- The lateral femoral cutaneous nerve, providing sensation to the lateral thigh, exits the pelvis under the inguinal ligament, close to the anterior superior iliac spine (ASIS).

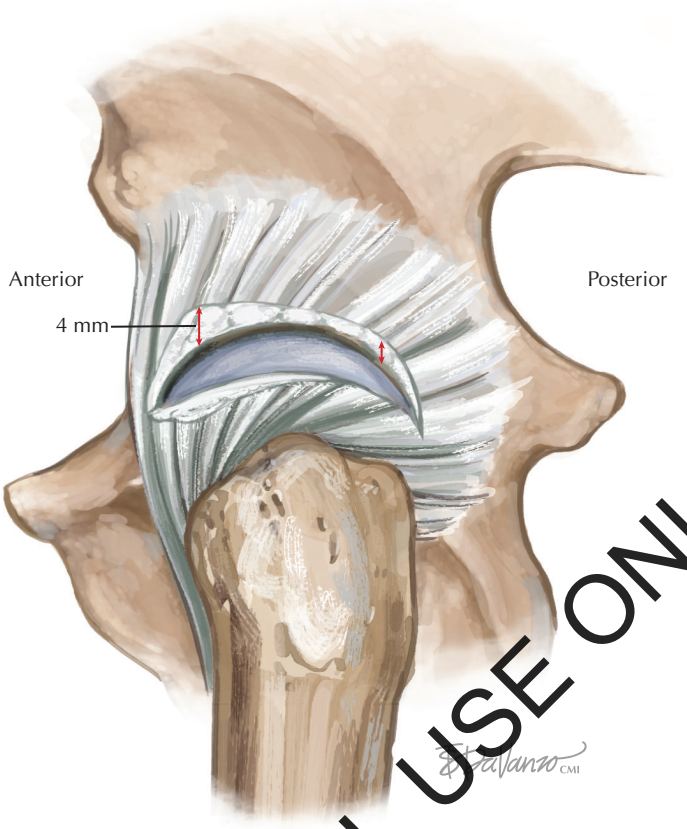


Figure 54.3. Left Hip With an Intraportal Capsulotomy. Note the thickness of the capsule at several locations (thickest at its superolateral portion).

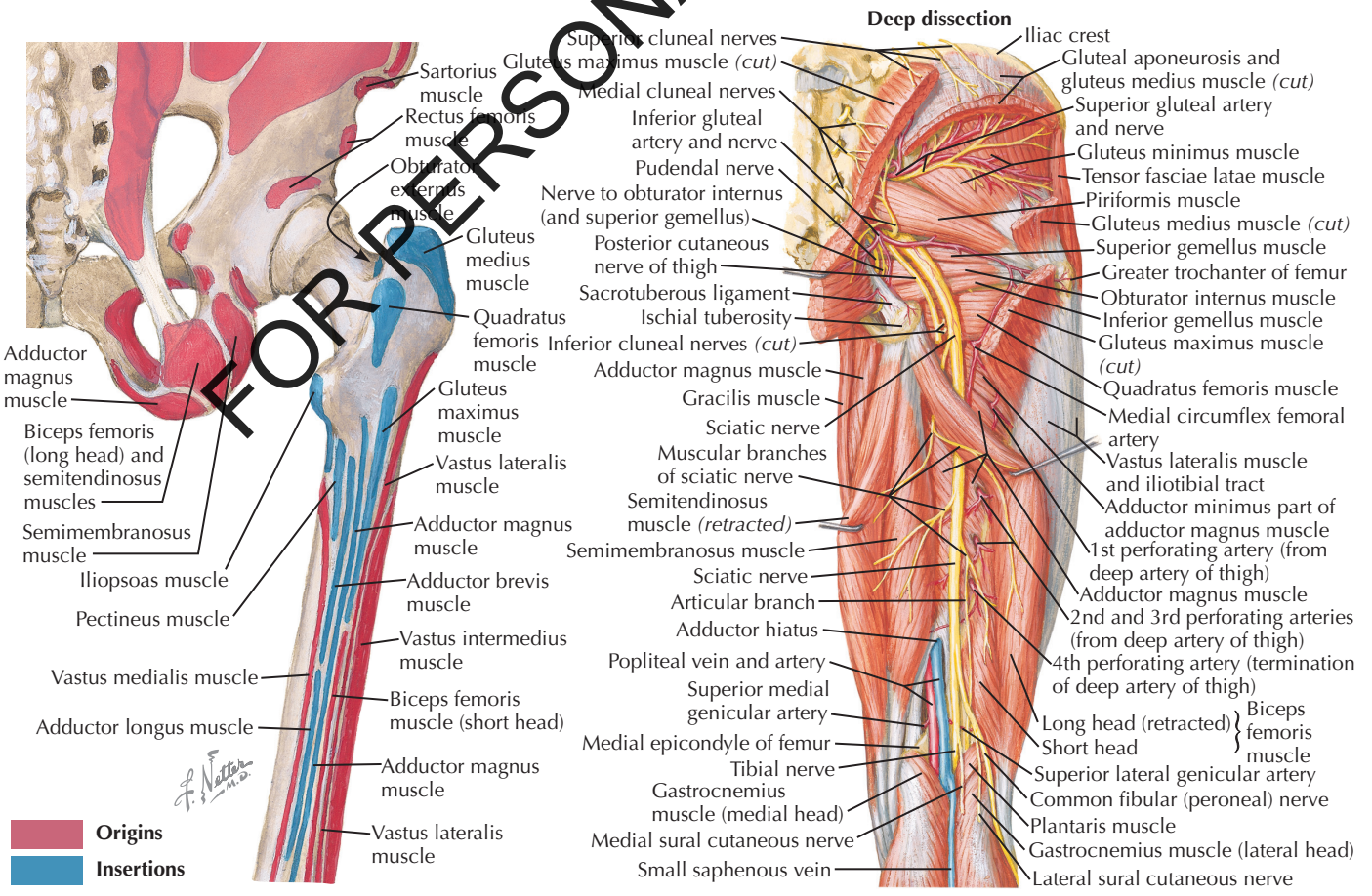


Figure 54.4. Muscles and insertions of pelvis, hip, and thigh.

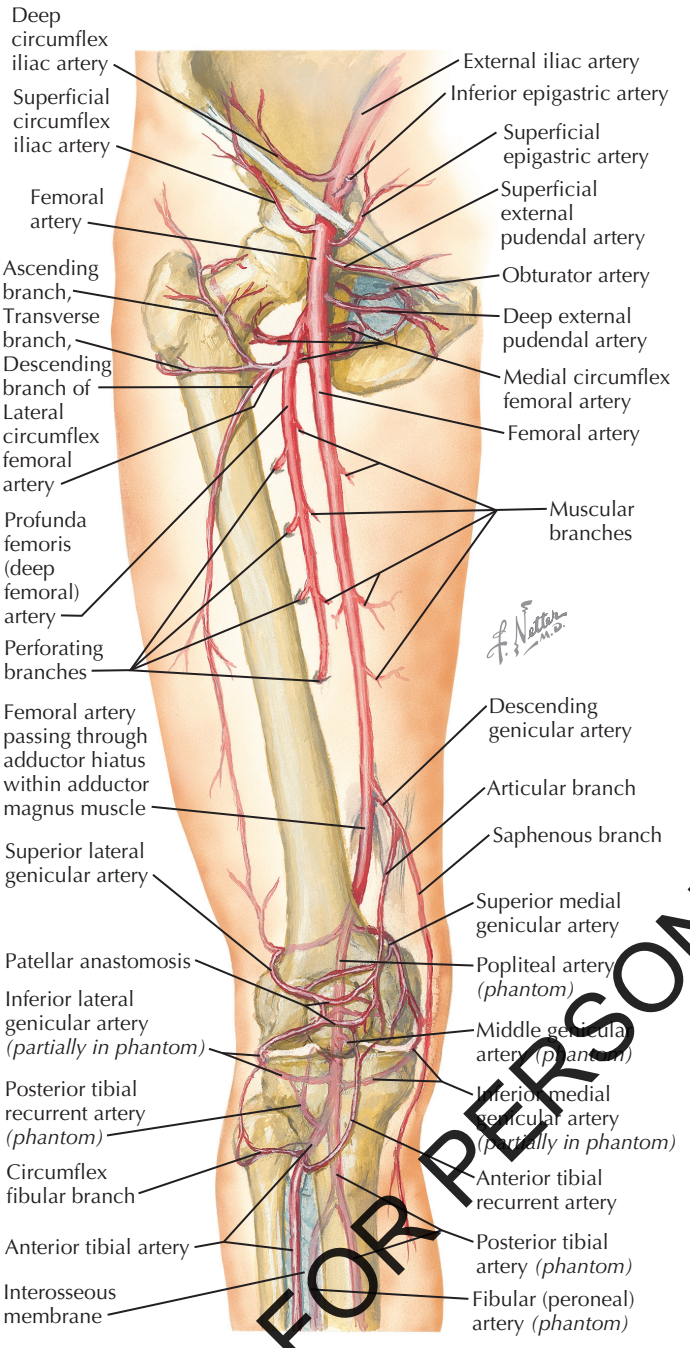


Figure 54.5. Arteries of the hip, pelvis, and thigh.

History and Physical Examination

History

- Acute onset of hip pain is more likely to be due to a specific pathology, which may be diagnosed through physical examination and imaging.
  - These injuries are typically easier to treat and carry a more favorable prognosis.
- Gradual onset of hip pain is likely to be due to (i) chronic disease or (ii) pain syndromes, which may be difficult to diagnose.
  - These injuries typically carry a worse prognosis and require more complex methods of treatment.

Inspection

- Examine patient's gait and stance.
- Examine patient's posture in supine and seated positions, looking for internal or external rotation of the injured limb at rest, or a flexion contracture of the hip joint.
- Check for asymmetry in leg length, muscle atrophy, or pelvic obliquity.

Range of Motion (ROM)

- When performing these measurements, it is important to assess if the range of motion (ROM) is limited or excessive; this will help differentiate between two different pathologies (impingement vs. dysplasia).
- Clinically, leg length can be measured from the ASIS to the medial malleolus.
- ROM should be measured bilaterally to compare the injured and noninjured sides. Hip flexion, extension, abduction, adduction, and internal and external rotation should be measured. Internal and external rotation should be assessed both with the patient supine, at 90 degrees of hip flexion, and prone with the hip at neutral. This last position will help define the patient's femoral version. Patients with excessive anteversion of the femur will have excessive internal rotation (IR) when they are prone and with the hip neutral.

Palpation

- The patient should be asked to point to the single most painful location; this will provide helpful clues as to the potential diagnoses.
  - Patients with hip pain will normally do the "C sign," grabbing their hip in a C-shape with their hand.
  - Patients with posterior pelvic pain may also have associated groin pain, lateral thigh pain, or anterior thigh pain.
  - Posterior pelvic pain may be associated with labral tear, developmental dysplasia of the hip (DDH), and/or FAI.
- Palpation should begin away from the source of the patient's pain and progressively move closer to the painful location.
- The following anatomic sites should be palpated to assess for significant pain: lumbar vertebrae, sacroiliac (SI) joint, ischium, iliac crest, greater trochanter, trochanteric bursa, muscle bellies of the thigh and hamstrings, and pubic symphysis.

SPECIFIC TESTS

- Before performing these tests, it is important to ask the patient to score the test. Tests are normally scored as follows:
  - + Patient feels pain but he/she has never felt this pain before.
  - ++ Patient has felt this pain before but it is not the pain that brings him/her to the office on the day of the visit.
  - +++ Patient states that the pain reproduced during the test is the pain that brings him/her to the office today.

Impingement:

- **FABER**: Stands for **F**lexion, **AB**duction, and **E**xternal **R**otation of the hip (Fig. 54.6A); pain during these movements represents a positive test indicating SI joint (if pain is located posteriorly) or hip (if pain is reproduced anteriorly in the groin) pathology.
- **FADIR:** Stands for **F**lexion, **AD**duction, and **I**nternal **R**otation of the hip (Fig. 54.6B); pain during these movements represents a positive test indicating either a femoral–acetabular impingement or an anterior labral tear.

Iliopsoas: The Thomas Test is used to test for a hip flexion contracture. The patient lies supine on the examination table and flexes the uninjured hip so that the knee is brought to the chest. If the contralateral leg remains on the table, there is no hip flexion contracture, whereas the leg will raise off of the table if a contracture is present. The bicycle test is also used to assess

Figure 54.6. Physical Examination. (A) Flexion, ABduction, External Rotation (FABER); (B) Flexion, ADduction, Internal Rotation (FADIR); (C) Bicycle test; (D) Posterior impingement test; (E) Adductor squeeze test; (F) Piriformis test.

for the presence of pain and snapping corresponding with iliopsoas tendinitis (Fig. 54.6C).

Posterior Impingement: The patient lies supine with the unaffected hip flexed as in the Thomas test. The examiner places the affected limb in extension, external rotation, and slight abduction while applying an overpressure into hip extension (Fig. 54.6D). Pain at the posterior hip indicates posterior impingement of the labrum. Posterior impingement could be observed in patients with anteverted femurs or patients with large femoral head deformities such as SCFE or Perthes with posterior impingement.

Adductor Squeeze Test: Used to test the strength of the adductors

The patient lies supine on the examination table with both hips flexed to 45 degrees. The examiner places both fists between the knees and asks the patient to squeeze (adduct) both knees simultaneously (Fig. 54.6E). A noticeably lower force exerted by one of the knees indicates adductor muscle weakness. Pain can also be quantified. Adductor tendinosis is frequently seen in patients with hip FAI.

Piriformis Test: Used to test for piriformis syndrome

The patient lies on the side of the unaffected hip with both knees flexed and then attempts to abduct the top knee against resistance from the examiner and holds it for 30 seconds (Fig. 54.6F). A positive test is indicated by pain in the buttock or shooting pain/numbness radiating to the posterior thigh or lower leg.

Pubalgia: Patient is lying supine and is asked to perform a sit-up. Palpation is performed in the area of the pubis. Tenderness in this area corresponds with pubalgia or rectus anterior tendinitis. Pubalgia is frequently seen in patients with hip FAI.

SPECIFIC INJURIES

Proximal Hamstring Injuries

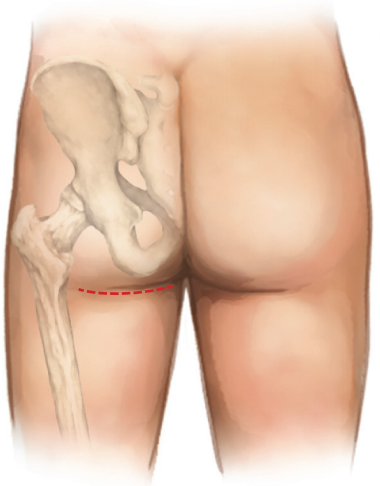
Description: Hamstring strain is the most common injury; this typically occurs during sprinting when there is a sudden stretch on the musculotendinous junction. In severe cases, complete avulsion may occur at the ischium. This is a very common injury seen in water skiers. Chronic tendinopathy is frequently seen in older patients as a degenerative process.

Symptoms: Sudden pain during exercising, particularly sprinting

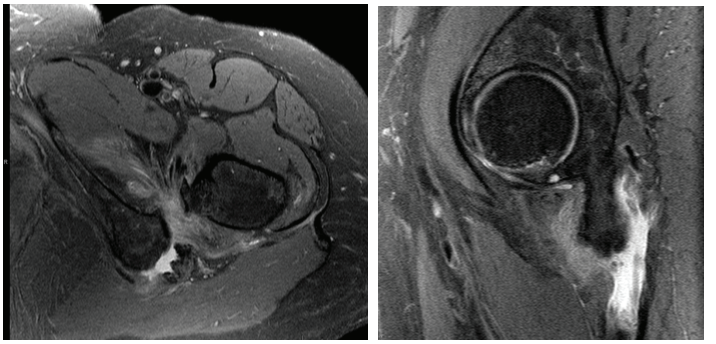
Pain may be along the posterior thigh up to the ischium. A bruise is normally evident in the buttock area. Certain patients may also report some numbness and tingling in the area corresponding to the sciatic nerve; this has been related to the presence of a hematoma that compresses the sciatic nerve.

Diagnosis: History usually provides clues to the diagnosis. Magnetic resonance imaging (MRI) is necessary to confirm the diagnosis and define treatment (Fig. 54.7).

Treatment: For hamstring strains, supportive treatment (rest, ice, compression, and elevation [RICE]) is sufficient. Once the pain subsides, stretching and strengthening exercises should be performed. For complete avulsion injuries, it is important to define the degree of retraction. If the hamstring is retracted more than 3 cm, early surgical intervention (within 6 weeks) is associated with quicker return to sports and less morbidity.



Posterior view demonstrating gluteal line incision for left sided open hamstring repair



Axial *(left)* and coronal *(right)* MRI of the left hip showing complete avulsion of the proximal hamstring tendons

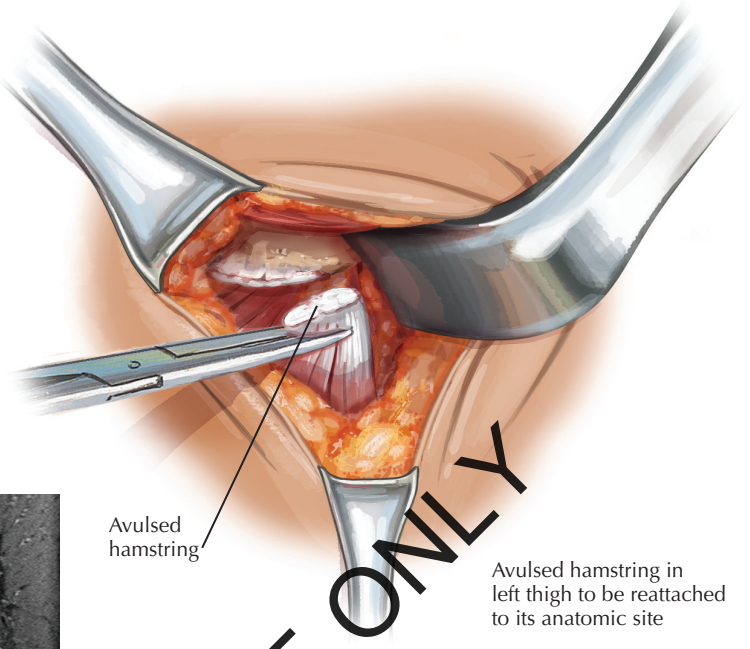


Figure 54.7. Proximal hamstring injuries.

Typically, an open surgery is performed (see Fig. 54.7). However, certain advanced hip arthroscopists may perform the procedure in a closed arthroscopic fashion. For patients with <3 cm of retraction, nonsurgical treatment with platelet-rich plasma (PRP) can be offered initially.

Prognosis: Depends on extent of initial injury and patient's activity level

For hamstring strains, patients should be pain free with full ROM before return to play. For complete avulsion injuries, return to sports varies based on timing of surgical intervention and typically ranges 16–29 weeks following surgery.

Rectus Femoris Injuries

Description: Similar to proximal hamstring injuries, strains of the rectus femoris (hip flexor strain) are more common than complete avulsions. The rectus femoris is the most commonly strained muscle in the quadriceps group. These injuries typically occur when attempting to kick a ball as in soccer or football, particularly when the patient's foot hits another player in the middle of the kicking motion.

Symptoms: Acute pain at the midline of the anterior thigh is most common. Pain or weakness may also be noted with resisted hip flexion or knee extension. A visible defect may be seen with complete avulsion of the rectus femoris tendon although these injuries are rare.

Diagnosis: Similar to hamstring strains, history and physical examination are usually sufficient for diagnosis, although MRI (Fig. 54.8) may be used to determine severity and confirm a complete avulsion of the rectus femoris from its origin on the AIIS.

Treatment: In cases of muscle strain, RICE and strengthening exercises are useful. With proximal rupture of the rectus femoris, nonsurgical management is an option, although surgical treatment with bone-anchoring sutures should be indicated in patients with loss of hip flexion strength and high-level athletes who wish to return to normal activity (see Fig. 54.8).

Prognosis: With conservative treatment, patients with rectus femoris strains do very well. Prognosis is also very good in patients who undergo surgical treatment for complete avulsion injuries, with return to sports at an average of 4 months following surgery.

Gluteus Avulsion

Description: Avulsion of the gluteus could compromise the gluteus maximus, medius, or minimus; these injuries are more common in older patients. However, it can be seen after an abrupt trauma in young active patients. Gluteus medius avulsions may be chronic ("rotator cuff tear of the hip") or may occur iatrogenically during total hip arthroplasty (THA) through an anterolateral or transgluteus approach.

Symptoms: Lateral hip pain and weakness of hip abduction; patients who suffer gluteal avulsions during THA will typically also present with a limp.

Diagnosis: An MRI should always be indicated in those patients with chronic lateral pain. Several patients are inaccurately diagnosed with chronic bursitis. MRI confirms the presence of gluteal tears from the greater trochanter or within the tendon.

Treatment: Surgical treatment with transosseus sutures or suture anchors is necessary in case of gluteal tears with retraction. Repair is performed in a SpeeBridge fashion (double row)

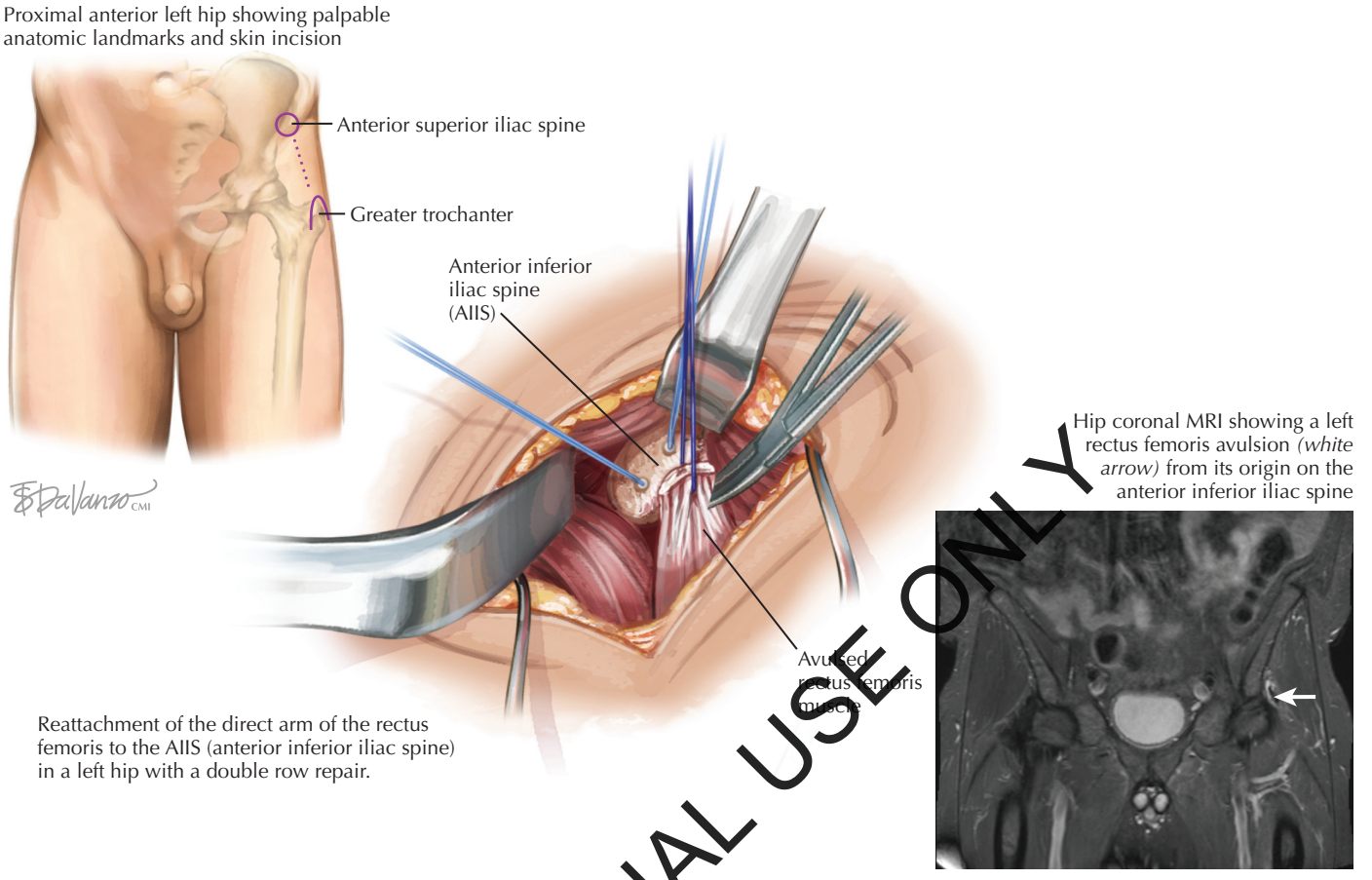


Figure 54.8 Rectus femoris injuries.

(Fig. 54.9). Use of an Achilles tendon allograft has been reported in patients with large chronic abductor tears. Early surgical management is preferred before the onset of muscle atrophy.

Prognosis: Surgical management is highly successful in relieving pain and weakness in patients with chronic tears. Patients with iatrogenic avulsions have less predictable improvement in strength after surgery.

Femoroacetabular Impingement (FAI)

Description: Results from abnormal contact between the femoral head and the acetabulum; there are three subtypes of FAI: CAM, pincer, and mixed

- CAM: The femoral head is not round and therefore cannot rotate smoothly inside the acetabulum. The uneven surface of the femoral head results in an increased load on certain aspects of the acetabular cartilage during hip motion (zone of collision) (Fig. 54.10).
- Pincer: An acetabular abnormality whereby extra bone extends beyond the normal rim of the acetabulum, thereby impinging upon the femoral head as well as the labrum.
- Mixed: Patients may also have a combination of both CAM and pincer types of impingement (see Fig. 54.10).

Symptoms: Limited ROM, particularly in flexion and IR, with concomitant groin/hip pain

Diagnosis: Physical examination, such as the FADIR test, may provide clues to the diagnosis, although imaging is necessary to confirm FAI. Anteroposterior (AP) and true lateral views of the pelvis should be obtained. MRI or computed tomography (CT) may provide additional information on the femoral–acetabular incompatibility.

Treatment:

- Acetabular rim trimming: For patients with pincer or mixed-type deformities, arthroscopic removal of extra acetabular bone may be helpful. The labrum is normally hypoplastic in these patients and red secondary to inflammation. No more than 4–6 mm of the acetabular rim should be removed because removal beyond this results in increased loads in the hip joint (see Fig. 54.10). It is crucial to use CT before surgery to determine the amount of rim that should be trimmed. Excessive rim trimming can lead to a dysplastic hip.
- Labral repair: The femoral–acetabular mismatch in FAI results in frequent bone–bone contact, which can damage the labrum. Thus, labral repair should be performed at the same time as other procedures for FAI (see Fig. 54.10).
- Labral reconstruction: For irreparable labral tears, labral reconstruction may be necessary; this can be performed arthroscopically with autograft or allograft tissue to replace the labrum.
- Femoral osteochondroplasty: In patients with CAM-type lesions, the femoral head–neck junction may be flat or convex, whereas normally it is concave. To alleviate the resulting abnormal contact between the femoral head–neck junction and the acetabular cartilage, an open or arthroscopic procedure may be performed to resect some of the bone overgrowth (see Fig. 54.10).

Prognosis: A high proportion of patients are able to return to sports following surgery for FAI, with a majority of these returning to the same level of activity as before symptoms began.

Hip Instability: Borderline Dysplasia and Developmental Dysplasia of the Hip (DDH)

Description: Typical anatomic changes in DDH include a misshapen femoral head, a shallow acetabulum with loss of anterolateral coverage, decreased acetabular lateral tilt, and excessive anteversion of the acetabulum and proximal femur. A combination of these bony abnormalities can result in anterior hip instability and early degenerative changes due to these abnormal hip joint forces. The center-edge angle (CEA) of Wiberg is the angle formed by a vertical line drawn from the center of the femoral head and a line from the center of the femoral head to the most lateral edge of the acetabulum. Values <20 degrees are considered abnormal (dysplastic). Values between 20 and 25 degrees are considered borderline dysplasia. The anterior center-edge angle (ACE) or Lequesne angle is measured on the false-profile view. Designed to assess anterior coverage of the femoral head, it can be calculated by measuring the angle between a vertical line through the center of the femoral head and a line connecting the center of the femoral head and the most anterior point of the acetabular sourcil. The measurement of the Tönnis angle can be determined by drawing three lines on the AP pelvic radiograph: (1) a horizontal line connecting the base of the acetabular teardrops (reference line); (2) a horizontal line parallel to line 1, running through the most inferior point of the sclerotic acetabular sourcil (point I); and (3) a line extending from point I to a point L at the lateral margin of the acetabular sourcil (the sclerotic weight-bearing portion of the acetabulum). The Tönnis angle is formed by the intersection of lines 2 and 3. Acetabula having a Tönnis angle between 0 and 10 degrees are considered normal, whereas those having an angle of >10 degrees or <0 degrees are considered to have increased and decreased inclination, respectively. Acetabula with increased Tönnis angles are subject to structural instability, whereas those with decreased Tönnis angles are at risk for pincer-type FAI.

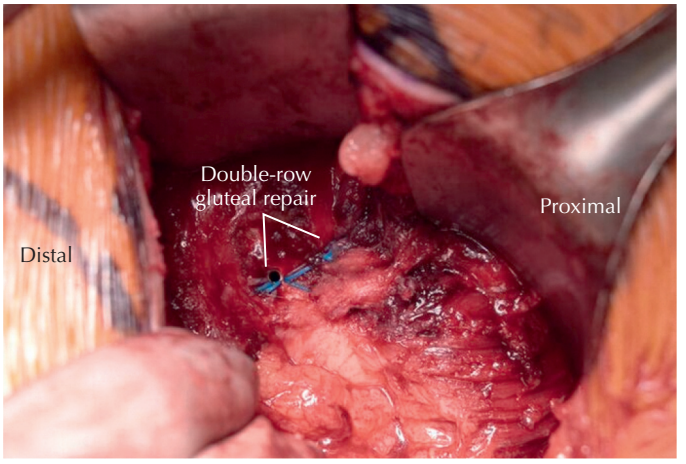
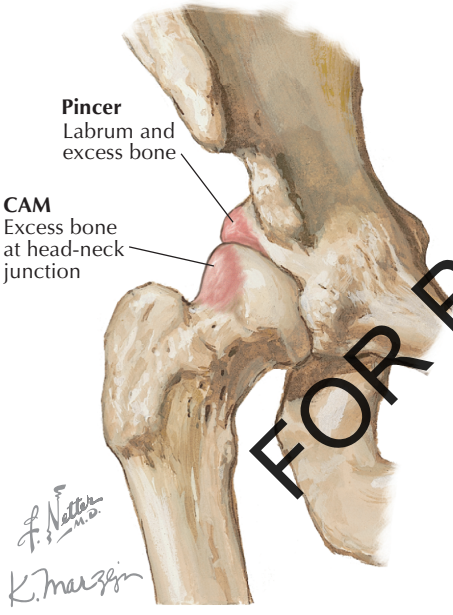


Figure 54.9. Knotless double-row repair of the gluteus medius tendon on a left hip.

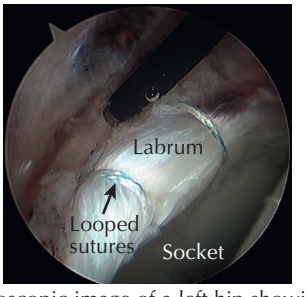
Symptoms: Dysplasia is more frequent in females. Patients normally present in the office complaining of hip pain. They are normally flexible and have preserved or excessive ROM,



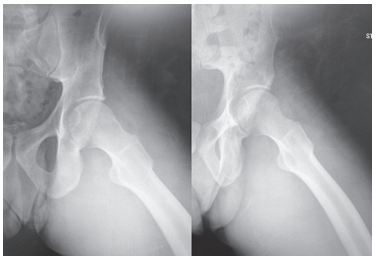
Plain AP hip radiograph demonstrating bilateral CAM impingement in a male patient

Plain AP hip radiograph with bilateral mixed FAI impingement (pincer-CAM)

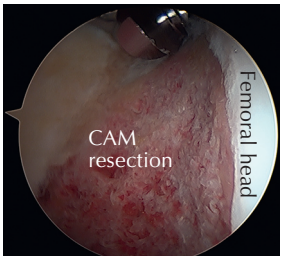
Plain AP hip radiograph showing postoperative results of pincer and CAM resection in a left hip



Arthroscopic image of a left hip showing a repaired labrum with looped sutures in its superolateral portion



Dunn view of a left hip before *(left)* and after *(right)* CAM resection



Arthroscopic view of a right hip demonstrating a CAM resection

Figure 54.10. Femoroacetabular impingement.

particularly IR. Patients may also describe popping, secondary to iliopsoas irritation. Patients typically have pain while standing up, which differs from patients with FAI, who report pain during sitting.

Diagnosis: Physical examination, together with radiograph, MRI, and CT are necessary for an accurate diagnosis of dysplasia.

- Radiograph: AP pelvis, Dunn view, and false profile should be evaluated. The AP pelvis should be a true AP pelvis for accurate measurements of the CE angle and Tönnis angle. Dunn view will determine the presence of a concomitant FAI CAM lesion and the false profile is used to measure the ACE angle.
- CT: This is critical to evaluate the version of the socket, femoral version, and presence of a concomitant CAM lesion. Most of these patients will present with an anteverted socket (>20 degrees) and an excessively anteverted femur (>20 degrees). It is important to determine the presence of dysplasia in a tridimensional way. A hip can be anteriorly or laterally dysplastic. Lateral dysplasia includes those patients in whom the lateral center edge angle is less than 20 degrees (lateral undercoverage). Others may present with a normal CEA but with an excessively anteverted socket, which undercovers the femoral head anteriorly.

Treatment: Will depend on the age of the patient, status of the cartilage, and the presence of concomitant FAI CAM lesions

In patients with degenerative cartilage, surgery is contraindicated. Surgery is indicated in young and active patients with normal cartilage. Typically, a hip arthroscopy is indicated followed by a periacetabular osteotomy (PAO). Hip arthroscopy should be performed before PAO to treat intra-articular pathology, including labrum repair, ligamentum teres tears, and cartilage damage. In such cases, a PAO is indicated to correct the dysplastic socket. In general, surgery is performed to correct the anterior and lateral coverage. However, in certain situations, a reverse PAO is indicated. This is indicated for patients with an excessively retroverted socket and posterior instability.

Perithrocanteric Space Disorders

Gluteal Bursitis and Ischial Bursitis

Description: Also known as *ischiogluteal bursitis* and results from inflammation of the ischiogluteal bursa found between the gluteus maximus and the ischial tuberosity

Symptoms: Pain at the medial buttock; may be difficult to distinguish from hamstring strain

Diagnosis: Pain elicited by pressure over the ischial tuberosity with the patient in the lateral decubitus position; absence of pain with stretching distinguishes ischial bursitis from a hamstring injury

Treatment: Conservative treatment with anti-inflammatory medications and modification of training regimen; use of corticosteroid injections into the ischiogluteal bursa and ischiogluteal bursectomy are poorly studied.

Prognosis: Return to sports may be allowed based on relief of symptoms. In refractory cases, more extensive diagnostic tests such as MRI may be necessary to rule out other pathologies such as hamstring tendon avulsions.

Trochanteric Bursitis

Description: Inflammation of the trochanteric bursa found just superficial to the greater trochanter

Symptoms: Pain in the buttock or lateral hip, exacerbated by lying on the affected side, going from a seated to a standing position, or running on banked surfaces such as roadsides

Diagnosis: Pain elicited by pressure at the lateral edge of the greater trochanter; occasionally, MRI is necessary to confirm the diagnosis and exclude the presence of a tear or tendinopathy of the glut

Treatment: Conservative treatment with anti-inflammatory medications, modification of training regimen, and corticosteroid injections into the trochanteric bursa; in refractory cases, arthroscopic bursectomy, iliotibial band release, or trochanteric reduction osteotomy can be considered.

Prognosis: Return to sports may be allowed based on relief of symptoms. Improvement in symptoms has been shown in a majority of patients undergoing various surgical treatments for trochanteric bursitis, although return to sports has not been well-defined in these patients.

Piriformis Syndrome

Description: Results from entrapment of the sciatic nerve under the piriformis muscle at the sciatic notch

Symptoms: Pain and symptoms of sciatica with sitting as this compresses the piriformis muscle against the sciatic nerve

Diagnosis: Typically, a diagnosis of exclusion; SI joint dysfunction and lumbar disc herniation should be ruled out through pelvic radiographs and MRI of the lumbar spine, respectively.

Treatment: Massage of the piriformis muscle in addition to physical therapy with piriformis stretching exercises may improve symptoms in mild cases. Use of nonsteroidal anti-inflammatory medications may reduce inflammation at the site of nerve compression. Corticosteroid injections directly into the piriformis muscle may reduce muscle spasms and pain. In more severe cases, Botox injections in the piriformis muscle may be more effective in relaxing the muscle. In patients who do not respond to conservative treatment for ≥6 months, release of the distal tendon of the piriformis muscle may be performed.

Prognosis: Return to sports may be allowed based on relief of symptoms. Good outcomes have been shown in a majority of patients undergoing surgical release.

SUMMARY

- History, physical examination, and imaging are the keys to accurate diagnosis of hip pathology.
- There have been significant advancements in arthroscopic techniques for surgical repair of hip pathology in recent years, which has resulted in an increase in the number of less invasive hip procedures.

RECOMMENDED READINGS

Available at www.ExpertConsult.com.