Chapter 8
The Hip

Evan Plowgian and Tamara Pylawka

Anatomy

The hip is a ball and socket joint, an articulation of the femoral head with the acetabulum (see Fig. 8.1). Its range of motion (ROM) includes flexion, extension, adduction, abduction, and internal and external rotation [1].

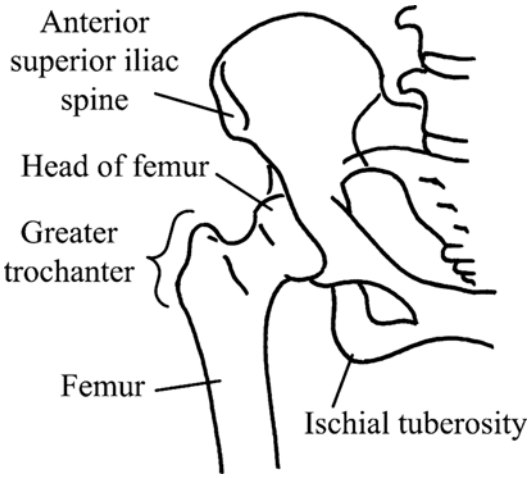

Fig. 8.1 Skeletal anatomy of the hip – anterior view

E. Plowgian, MD (✉)
Department of Sports Medicine, UAP Bone and Joint Center, Terre Haute, IN 47804, USA
e-mail: evanplowgian@gmail.com

T. Pylawka, MD
Division of Orthopaedics, Department of Surgery, SIU School of Medicine,
Quincy, IL 62301, USA
e-mail: tpylawka@siumed.edu

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Red Flags

- Systemic symptoms, such as fever or weight loss, may indicate systemic illness, such as infection (septic joint) or malignancy, and these patients should be evaluated thoroughly to rule out major pathology.
- Pain that is worse at night is also concerning for malignancy.
- Patients who are completely unable to bear weight should also be evaluated immediately by X-ray. Inability to bear weight may indicate fracture or avascular necrosis of the femoral head [1].

Approach to the Patient with Hip Pain

As with any chief complaint, it is important to obtain a thorough history. History should include onset, location, and duration of pain, as well as risk factors including past medical history, past surgical history, history of injury or trauma, and medication use. Activity level including regular exercise, or lack thereof, and occupational activities and exposures should also be included. History is very helpful in determining the etiology of the pain and will guide your focused clinical exam. The location of the pain can be very helpful in organizing your differential diagnosis, as the causes of anterior, posterior, and lateral hip pain are often very different. Also, a patient complaining of "hip pain" may actually be experiencing symptoms stemming from the low back or pelvis, so these should remain on a working differential diagnosis.

Hip Exam

All hip exams should include the following: gait assessment; assessment of range of motion (ROM) of the hip, as well as brief neurovascular exam, strength testing, including distal pulses, and straight leg raise and/or slump test, to rule out radicular etiology. Limited ROM, particularly of internal rotation, suggests intra-articular pathology, such as a fracture, or arthritis. Normal external rotation ranges from 30 to 45°, internal rotation from 20 to 35°, and flexion from 120 to 125° [1].

Anterior Hip Pain

In the adult population (pediatric patients are discussed in Chap. 12), the most concerning etiologies of anterior hip pain are those involving the joint itself, or intra-articular causes. These include osteoarthritis (OA) and femoroacetabular impingement (FAI).

OA of the hip occurs typically in patients over the age of 50. In addition to age, other risk factors such as obesity, prior injury, and family history may predispose a patient to OA. Elements of the history that may indicate OA are as follows: groin pain that is worse with activity, morning stiffness usually lasting less than 30 min, and specific activity triggers, such as getting into and out of a car. On physical exam, pain with active or passive internal or external rotation (particularly internal), often, is an indication of intra-articular pathology such as OA. Radiographs are not necessary to make the diagnosis but should be obtained if other diagnoses are being entertained or conservative therapy has failed. Treatment involves weight loss, analgesic medication, PT, steroid injection, and ultimately hip replacement, when all other treatment measures fail to control or manage the symptoms [1].

Femoroacetabular impingement (FAI) is the abnormal articulation of the acetabular rim and the proximal femur. It can lead to injuries of the labrum and articular cartilage and can lead to osteoarthritis of the hip if left untreated. Elements of history that may indicate FAI include the following: anterolateral hip pain, aggravated by prolonged sitting, leaning forward, or pivoting motions in the young adult population [2]. On physical exam, range of motion will often reproduce the pain for patients, as will many special maneuvers. The most sensitive of these is the FADIR test or flexion, adduction, and internal rotation (Fig. 8.2) [2].

Other intra-articular causes of hip pain may present as anterior pain. Stress fracture, avascular necrosis (AVN), septic arthritis, and mild undetected congenital or developmental conditions may all present as anterior hip pain or groin pain [3].

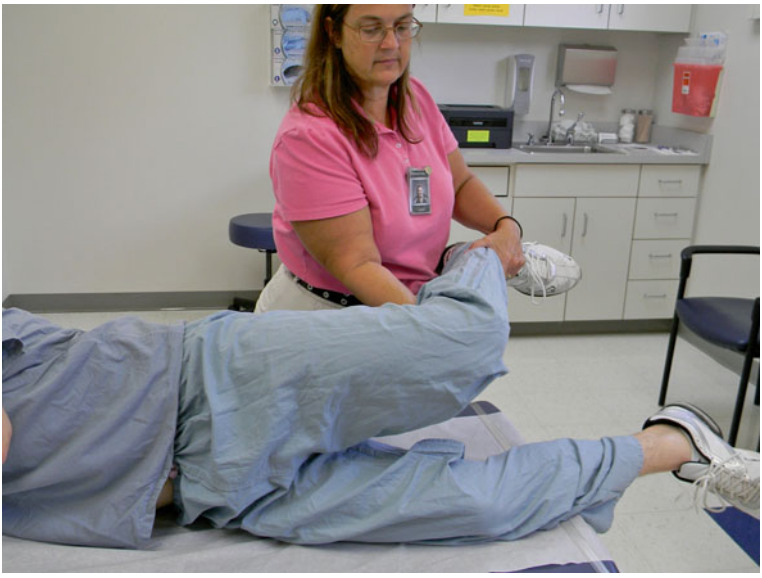

Fig. 8.2 FADIR

Table 8.1 Extra-articular sources of hip pain

Condition	Typical presentation
"Hip pointer"	Lateral pain after direct trauma, tender on iliac crest
Abdominal or inguinal hernia	Anterior or groin pain worse with Valsalva
Sportsman's hernia	Hernia-like pain with no demonstrable hernia on exam or imaging
Meralgia paresthetica	Anterolateral hip/thigh pain and numbness
Osteitis pubis	Pubic symphysis inflammation and pain, difficult to distinguish from adductor strain
Adductor strain	Adductor muscle pain, often associated with pelvic instability and SI joint path
Femoral neck stress fracture	Anterior hip pain associated with recent increase in running

These will often present with difficulty or inability to bear weight and should be imaged by X-ray and MRI if X-rays are negative.

Those related to extra-articular sources are listed on Table 8.1 [1]. When evaluating groin pain, it is important to examine the groin for any soft tissue masses, such as testicular masses, hernias, or enlarged lymph nodes that may be the cause of the pain [1].

Those patients with anterior hip/groin pain with no other findings can be managed conservatively. Physical therapy and analgesic medication for 30–90 days may bring a resolution of symptoms. If the pain persists, however, further evaluation by referral or MRI should be considered [1].

Posterior Hip Pain

Often patients complaining of posterior hip pain have conditions related to pathology in the lower back or pelvis. A thorough low back exam and neurologic exam, including performing a straight leg raise and/or slump test, are particularly important in patients with posterior pain. Patients may have radicular symptoms stemming from the lumbar spine.

Testing for SI joint is also important in patients with posterior pain. The FABER test (Fig. 8.3), during which the examiner flexes, abducts, and externally rotates the hip, is particularly sensitive for SI joint pathology [1]. Physical therapy is the first-line treatment for SI dysfunction; chiropractic adjustment or osteopathic manipulation may also be helpful. Referral may be appropriate if the cause of symptoms is unclear, or patient has prolonged course of symptoms, not improving with treatment.

Fig. 8.3 FADER

Lateral Hip Pain

Lateral hip pain is often attributed to a single diagnosis: greater trochanteric bursitis. Pain around the greater trochanter is a common problem, but recent literature suggests that it may be secondary to a variety of either intra-articular or periarticular pathologies [4]. The gluteus medius and minimus tendons insert at this site, as well as the tensor fasciae latae, and these structures are more likely pain generators than the trochanteric bursa itself. Gluteal tendon tears as well as tendinopathy are often present in patients with trochanteric pain and can be readily seen on ultrasound [4]. Bursal fluid collections may also be seen, often coinciding with tendon pathology, making it unclear whether bursal fluid collection is a sequela of tendon disease, or if these two conditions are both causes of lateral hip pain. Steroid injections are often provided as treatment for trochanteric bursitis, whereas rest and physical therapy are first line for gluteal tendinopathy. However, steroid injections may be used in refractory cases [4].

Please refer to Fig. 8.4 for the Hip Meaningful Use Form.

CC: ☐ Right ☐ Left ☐ Both

HPI:
Onset: _____
Mechanism of Injury: _____
Relieving Factors: _____
Exacerbating Factors: _____

PMH: Chronic Medical Conditions: _____
_____
Occupation/Sport /Position: _____

Red Flags:

1. Inability to bear weight
2. Constitutional symptoms
   a) Weight loss
   b) Fever
   c) Amenorrhea

Q1. Is the problem coming from the hip?
Consider pelvic, lumbar spine, SI involvement,
Hernia versus true hip pathology
Low back exam, provocative maneuvers –SLR & Slump test
ROM, to determine intra-articular vs extra-articular, consider imaging

Q2. What type of imaging should I use?
XRays are appropriate to evaluate for fracture, dislocation, OA.
MRI (w/ or w/o contrast) may be necessary for labral tears, other soft tissue pathology
Ultrasound may be useful for detecting effusions, bursitis, tendinopathy, to confirm diagnosis, and for treatment (injections, etc)

Q3. How to treat?
a) Conservative
b) Imaging
c) Referral

Common and "don't miss" conditions

- Femoroacetabular Impingement (FAI)
- Trochanteric pain syndrome (trochanteric bursitis)
- Osteoarthritis
- Labral tear
- Piriformis syndrome
- Femoral neck stress fracture
- Slipped capital femoral epiphysis(pediatric)
- Leg Calve Perthes (pediatric)

Fig. 8.4 The Hip Meaningful Use Form

• **TREAT APPROPRIATELY**	Trochanteric Bursitis.....726.5 Osteoarthritis.....715.95 ITB Syndrome.....728.89 SI Joint Pain.....719.45 Sprain/Strain.....843.x Low Back Pain.....724.2
TREAT WITH CLOSE FOLLOW-UP	Soft Tissue
CALL CONSULTATNT THAT DAY	Can't walk AVN Fracture
CONSULT OR REFER	OA, failed conservative treatment Suspected fracture Diagnosis unknown

Plan:
☐ Xray / Imaging What: _____
☐ Laboratory Eval What: _____
☐ NSAIDs _____
☐ Acetaminophen _____
☐ Other _____
☐ PRICE Protocol
☐ Physical Therapy

Disposition:
☐ Treatment initiated: Follow-up _____ weeks
☐ Treatment / Work up Initiated: Follow-up ≤ 1 week _____ days
☐ Immediate call to Dr. _____
☐ Consultation initiated with Dr. _____
☐ Referral to Dr. _____

Fig. 8.4 (continued)

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