REVIEW ARTICLE

Orthopedic Hip Injuries Encountered in the Primary Care Setting

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KEYWORDS

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ABSTRACT

Hip pain and disorders are commonly seen in adults and children in the primary care setting. Primary care physicians can manage many of these disorders through physical examinations and basic radiographs, but some may pose a challenge requiring advanced imaging and specialist intervention. This article will review 12 common hip injuries encountered in primary care when conservative management is feasible and when a specialist referral is necessary.

INTRODUCTION

Hip pain and pathology are common chief complaints in the primary care setting. The hip comprises the femoroacetabular joint, a ball-and-socket joint formed between the femoral head and the acetabulum of the pelvis. The acetabulum is formed by the fusion of the three pelvic bones, including the ilium, ischium, and pubis. The teres ligament, the joint capsule, and the transverse ligament mainly stabilize the hip joint. The hip exhibits freedom of motion in all planes, including flexion, extension, abduction, adduction, internal rotation, and external rotation. The hip is critical in maintaining balance, weightbearing, and ambulation. Hip pain is often localized to one of three locations with certain disorders following typical pain patterns. These locations include anterior, lateral, or posterior pain. Hip pain may also occur due to lumbar or sacroiliac joint pathologies. A detailed physical examination and appropriate imaging are vital to determine the cause of the pain, as one disorder can exacerbate other pathologies of the hip in the acute or chronic setting.

Hip pain and hip disorders are commonly seen in adults and the pediatric population within the primary care setting. It is imperative to discern what can be managed conservatively by the primary care physician and when it is warranted to refer to a specialist for urgent management. This article will review 12 common hip disorders in the adult and pediatric population

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FEMOROACETABULAR IMPINGEMENT

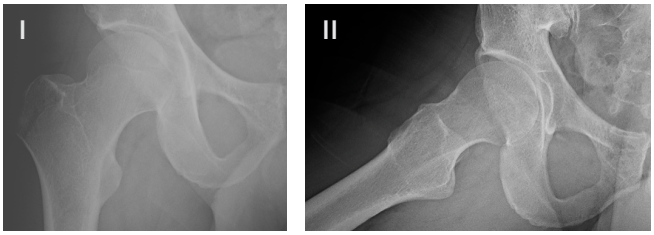
Femoroacetabular impingement is a common cause of anterior hip pain in young adults. Its incidence adjusted for age and sex is 54.4 per 100,000 person-years.[1] Femoroacetabular impingement is characterized by a cam deformity, a pincer deformity, or both. A cam deformity is a bony overgrowth involving the femoral head and neck junction, preventing the femoral head from rotating smoothly inside the acetabulum.[2] Alternatively, a pincer deformity is bony over coverage of the acetabulum that can be focal or global, resulting in compression of the labrum under the rim of the acetabulum.[2] Femoroacetabular impingement often presents without a specific injury and is gradual in progression. It is important to note that the diagnostic criteria have changed since being defined in 1999. A triad of clinical symptoms, examination findings, and radiographic findings are needed to reliably diagnose the condition.[1]

Patients typically present with pain or stiffness in the anterior groin or thigh. Pain is often exacerbated with flexion of the hip, sitting for long periods of time, or with flexion of the lumbar spine from a seated position.[3] While many patients with femoroacetabular impingement have had deformities since birth, it is possible to develop the abnormal anatomy over time, particularly in young athletes who require a wide range of motion for activity or patients with a previous history of slipped capital femoral epiphysis.[4] Passive range of motion and special tests, including FADIR and FABER tests, are utilized to diagnose intra-articular hip pathology. The flexion adduction internal rotation (FADIR) test is performed with passive flexion, followed by adduction and internal rotation of the hip. The test is positive if the pain is reproduced within the anterior groin/hip. The flexion abduction external rotation (FABER) test is performed with passive flexion and then abduction and external rotation of the hip. Similarly, the test is positive if the pain is reproduced in the anterior hip/groin.

Radiographs should be obtained to diagnose and evaluate the cause of bony pathology. 90-degree Dunn view and Meyer lateral views are best for visualizing cam deformities, while a standing anteroposterior view of the pelvis may be best for diagnosing the pincer deformity[5] (Figure 1). In a patient diagnosed with femoroacetabular impingement, first-line treatment is conservative, including rest, activity modification, nonsteroidal anti-inflammatory drugs (NSAIDs), and possibly physical therapy. If pain persists, a referral to an orthopedic surgeon is recommended for further evaluation. Two components may be addressed with orthopedic surgical intervention. First, surgical intervention may address repairing or removing damaged labral tissue. Secondly, surgical intervention can be done to arthroscopically correct the bony deformities of the femoral head, acetabulum, or both.

FIGURE 1:

Anteroposterior radiograph (I) and Frog leg view (II) of identical right hip demonstrating cam deformity in the anterosuperior position of the femoral head-neck junction (green arrow).



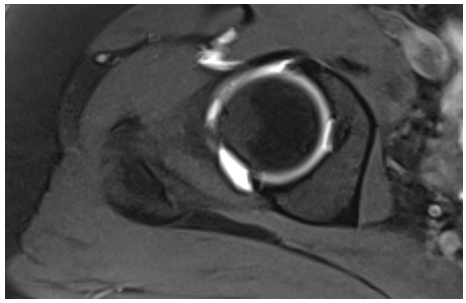
LABRAL TEAR OF HIP

The labrum is the cartilage that lines the acetabulum, assists in holding the femoral head within the hip socket, and aids in cushioning the hip joint. Labral tears are common in athletes who participate in sports, including soccer, football, and ice hockey and are associated with repetitive movements. A hip labral tear may also present following a traumatic injury. Labral tears often result from femoroacetabular impingement due to compression and excessive stress placed on the labrum from bony overgrowth and abnormalities within the hip joint.[2] Symptomatic labral tears are more common in females, which may be partially due to an increased incidence of hip dysplasia in women.[6] Anterior labral tears are the most common type of hip labral tear, typically caused by repetitive pivoting and twisting.

At presentation, patients may complain of pain in the hip, groin, or buttocks, particularly while ambulating. Range of motion is not typically restricted, but pain may be invoked at extremes. There may also be a catching, locking, or "clicking" sensation in the hip with ambulation. Additionally, physical examination testing, including FADIR and FABER, is helpful in the diagnosis of intra-articular hip pain. A standing radiograph should be obtained as the initial imaging test. The gold standard for diagnosing labral tears is direct visualization by arthroscopy, but less-invasive measures through imaging may be completed first. With recent advancements, a noncontrast 3-tesla magnetic resonance imaging (MRI) is as sensitive and specific as a magnetic resonance arthrography, previously the diagnostic standard for labral tears[7] (Figure 2). The noncontrast 3-tesla MRI also does not require a contrast injection. Standing AP X-rays are beneficial to detect any abnormalities in the alignment or shape of the hip joint, but they are not diagnostic for labral tear alone.

FIGURE 2:

MRI T2-weighted axial sequence of the hip demonstrates a partially detached tear of the anterior superior labrum (green arrow).



There are four grades of injury for hip labral tears. A grade I tear indicates a minor tear in the labrum's outer edge that does not extend into the cartilage. A grade II tear signifies a more significant tear extending into the labrum without reaching the cartilage. A grade III tear is a complete tear extending through the entire labrum while leaving the cartilage intact. A grade IV tear represents a complete tear that extends through the labrum and cartilage, exposing the underlying bone.[8]

Hip labral tears do not heal on their own. The goals of nonsurgical treatment focus on symptom management and preventing further damage to the labrum. This includes rest and activity modification, NSAIDs, injections, and particularly physical therapy that can assist in strengthening and stretching hip muscles to support the joint. Additionally, osteopathic manipulative techniques (OMT) can provide additional benefits in stretching local muscles, which effectively should aid in the overall balance of structures and preserving function for the patient. If conservative treatment fails or hip instability is noted, arthroscopic surgery can be completed to repair the tear. Patients presenting with femoroacetabular impingement and labral tears are more likely to need surgery than either pathology alone.[9]

OSTEOARTHRITIS

Osteoarthritis is the most common joint disorder in the United States. Osteoarthritis of the femoroacetabular joint is the most common cause of anterior hip pain in older adults.[10] Osteoarthritis is a degenerative joint disease resulting in losing articular cartilage over time. A diagnosis of hip osteoarthritis is based on symptoms, physical examination, and radiographic findings. Osteoarthritis of the hip typically presents gradually, with women being more likely to develop hip osteoarthritis than men.[10] Risk factors include older age, obesity, joint injuries, bone deformities, and repeated stress on the joint. Individuals with this condition may have pain with ambulation and sitting for long periods. In the morning or after long periods of inactivity, patients may develop a feeling of stiffness known as the "gel phenomenon" caused by a temporary

thickening of natural fluids inside the joint. Range of motion may be decreased, and certain maneuvers, including internal and external hip rotation in a flexed position, may exacerbate the pain. Radiation of pain typically presents to an anterolateral portion of the affected hip/groin.

Standing anteroposterior radiography of the pelvis is the imaging modality of choice. Radiographic findings include osteophyte formation, subchondral cyst formation, and subchondral sclerosis (Figure 3). The most common method for radiographically defining the degree of osteoarthritis is the Kellgren-Lawrence grading scheme, which grades joints from zero to four, with four being the most severe. A definite osteophyte found on a radiograph would define at least a grade 2 osteoarthritis, while complete joint space narrowing indicating bone-on-bone contact defines a Kellgren-Lawrence grade 4 osteoarthritis.[11] However, not all individuals with advanced radiographic findings have clinical disease, and not all individuals with clinical symptoms may have accompanying radiographic findings.

FIGURE 3:

Anteroposterior (I) and frog leg (II) radiographs of the hip demonstrate reduced joint space, subchondral sclerosis of the superior acetabulum, osteophytes, and remodeling of the acetabulum.

As osteoarthritis is a degenerative disorder, the treatment goals for hip osteoarthritis are to improve function, maintain mobility, and control pain. Initial nonsurgical treatments include activity modifications such as avoiding running or jumping to avoid flare-ups. Lifestyle modifications include weight loss to reduce stress on the joint. Physical therapy can help increase hip strength and decrease muscular compensation in the affected and contralateral hip. Remaining physically active is imperative for the management of symptoms. OMT, including muscle energy techniques, ligamentous articular strain, and articulatory techniques, such as the Spencer technique to the affected joint and hip, may be completed to improve motion by breaking up micro-adhesions that have formed over time. Medications such as NSAIDs may be used for symptomatic relief of pain, but risks and benefits must be considered, given long-term side effect profiles. Injections include corticosteroids, hyaluronic acid, or platelet-rich plasma injections, which may be used to relieve pain and mobility. If quality of life suffers or nonsurgical options cannot adequately relieve symptoms, a referral to an orthopedic surgeon and surgical options such as hip replacement surgery can be completed.

GREATER TROCHANTERIC PAIN SYNDROME

Greater trochanteric pain syndrome (GTPS) is a common cause of lateral hip pain. GTPS affects patients between the ages of 40 and 60 years. It is more commonly seen in females and has been found to have an incidence of 1.8 patients per 1000 per year.[12] GTPS was conventionally believed to be due to trochanteric bursitis, but it has been determined that it is the result of tendinopathy of the gluteus medius and gluteus minimus; this may or may not present with simultaneous pathology of the bursa. As the hip moves into adduction, the iliotibial band causes impingement of the gluteal tendons and bursa onto the greater trochanter through compressive forces. A lateral pelvic tilt results in weakness of the hip abductors and additionally increases compressive forces.

Patients with GTPS may present with lateral hip pain localized to the ipsilateral greater trochanter. Pain is worse with laying on it at night and weightbearing activities with possible radiation of pain to the lateral knee of the affected side. Overuse injuries, unaccustomed exercise, and long-distance running can trigger GTPS. Special tests, including direct palpation and single-leg stance tests, can be completed. Direct palpation of the greater trochanter has a positive predictive value of 83% for positive MRI findings. The single-leg stance test is positive if there is pain within 30 seconds of standing on one leg. The single-leg stance test has a 100% positive predictive value for positive MRI findings.[13] Additionally, the FADIR, FABER, and passive hip adduction while lying lateral (ADD test) can increase forces on the affected tendons and replicate the pain. Trendelenburg's gait may also be positive, given gluteus medius tendinitis and associated weakness.

GTPS is typically a clinical diagnosis, but a standing pelvic X-ray may be utilized in mixed clinical pictures to rule out differentials such as osteoarthritis. The treatment goals for GTPS include reducing the compressive forces across the greater trochanter, treating comorbidities, and strengthening gluteal muscles. Conservative therapy includes NSAIDs, targeted physical therapy for strengthening and optimizing biomechanics, weight loss, and osteopathic manipulative techniques such as counterstrain and muscle energy techniques.[14] Corticosteroid injections and therapeutic ultrasound can be effective in refractory cases. Exercise and load management are pivotal for overuse-induced GTPS. Surgical intervention is reserved for cases that have failed all prior available treatments.

PIRIFORMIS SYNDROME

The piriformis is a flat narrow muscle that attaches from the anterior surface of the sacrum to insert onto the greater trochanter of the femur. Piriformis syndrome occurs when the piriformis muscle compresses the sciatic nerve, resulting in nerve inflammation. Patients typically present with posterior hip pain, buttock pain, and a burning pain down the leg. It is found frequently during the fourth and fifth decades of life.[15]

The pain may be exacerbated by climbing stairs, physical inactivity, overuse such as long-distance running, and sitting for long periods. Additionally, congenital abnormalities of the sciatic tissues is also important. A delay in treating piriformis syndrome may lead to other pathologic conditions, including sciatic nerve involvement, chronic somatic dysfunction, and localized compensatory changes, including paresthesia, hyperesthesia, and muscle weakness.

HIP DISLOCATION

While rare, hip dislocations result in femoral head dislocation from the acetabular socket following traumatic hip injuries with a high incidence of associated injuries. Patients are typically young and present following high-energy trauma. The labrum, capsule, ligamentum teres, and the bony anatomy of the acetabulum intrinsically stabilize the hip. Ninety percent of hip dislocations are classified as posterior dislocations in which there is an axial load on the femur with the hip flexed and adducted. This typically presents as a "dashboard injury."[17] Co-morbid conditions associated with posterior dislocation include osteonecrosis, posterior wall acetabular fracture, sciatic nerve injuries, femoral head fractures, and ipsilateral knee injuries.[17] Alternatively, anterior dislocations occur with the hip in abduction and external rotation and may result in obturator nerve injury.

Patients typically present with acute pain, inability to bear weight, and deformity of the hip. Patients with a posterior dislocation will present with hip and leg in slight flexion, adduction, and internal rotation. Completing a detailed neurovascular examination is important, given the risk of sciatic nerve damage. Furthermore, assessing the ipsilateral knee for instability or injury is important. Patients with concerning findings should be sent to the emergency department where advanced trauma life support (ATLS) protocols can be completed due to association with other injuries. Anteroposterior and cross-table lateral radiographs should be obtained to determine dislocation. It is important to follow up with repeat imaging follow-reduction. CT may also be useful in determining the direction of dislocation, loose bodies, and associated fractures. Postreduction CT must be performed for all traumatic hip dislocations to assess for femoral head fractures, loose bodies, and acetabular fractures.[17]

Treatment options include surgical and nonsurgical intervention. Nonoperative intervention includes emergent closed reduction within 12 hours of injury for acute anterior and posterior dislocations; however, a femoral neck fracture would be a contraindication for nonoperative treatment. Closed reduction must have adequate sedation and muscular relaxation to perform the reduction. Operative treatments include open reduction with or without removal of incarcerated fragments. This is indicated by irreducible dislocation, delayed presentation, and evidence of incarcerated fragment. An open reduction and internal fixation (ORIF) surgery should be completed when fractures of the acetabulum, femoral head, or femoral neck are determined.[18]

FEMORAL NECK FRACTURE

Hip fractures account for over 300,000 hospitalizations in people aged 65 years and older annually in the United States.[19] Women experience approximately three-quarters of all hip fractures, which is associated with women falling at a higher rate and women having a higher incidence of osteoporosis. Greater than 95% of hip fractures occur due to a fall, particularly falling sideways.[19] The risk of fracturing a hip increases as patients get older. Most hip fractures occur at the femoral neck or intertrochanteric region. Hip-fracture patients typically present with an inability to bear weight, severe pain in the hip or groin, and a shortened, externally rotated, abducted leg while in the supine.

Radiographic imaging should be completed to assess femoral neck fracture. Anteroposterior view, cross-table lateral, and full-length femur are the recommended views for radiographic imaging. Specifically, the traction-internal rotation AP view is the most useful for defining fracture type. If there are negative radiographic results but fracture is still suspected, MRI may be utilized to rule out occult fracture.[20] Classification of femoral neck fractures is typically made using the Gardner classification from type I to type IV.

Nonoperative treatments with observation alone may be considered for patients who are nonambulatory at baseline, have minimal pain, and are high-risk candidates for surgery. Various surgical procedures based on patient demographics and fracture type may be indicated, including ORIF, cannulated screw fixation, sliding hip screw, and others.[21] Elderly patients with suspicion of hip fracture should be brought to surgery as soon as medically optimized. Surgical timing to operative management has a smaller effect than surgical method and quality of surgery.

Complications of femoral neck fracture include osteonecrosis in approximately 10% to 45% of patients. Greater initial displacement increases the risk for avascular necrosis (AVN), but nondisplaced injuries may still develop AVN. Nonunion is another complication with an incidence of 5% to 30%. There is a larger rate of hip dislocation following total hip arthroplasty. Overall mortality at 1 year is 25% to 30%, with a decreased mortality risk at 30 days and at 1 year when surgical intervention is performed within 24 hours of injury.[2]

Steps can be taken to prevent hip fractures, including evaluating the risk of falls and reviewing medications to prevent polypharmacy that may make the patient dizzy or tired. Women greater than 65 years need to be screened for osteoporosis. Regular physical activity and balance exercises should be done to improve leg strength and balance and reduce fall risk. Additionally, safety measurements in the home, including grab bars inside and outside the shower or next to the toilet, railings on the stairs, and reduction of objects that can be tripped over, aid in preventing falls commonly associated with hip fractures.

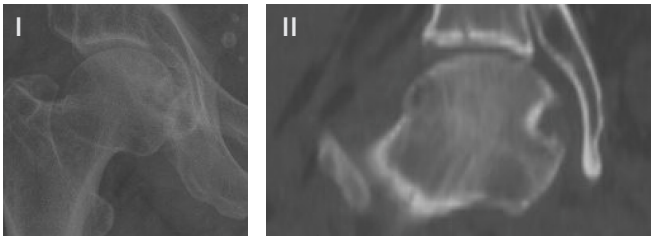
AVASCULAR NECROSIS OF THE HIP

AVN of the hip, or osteonecrosis, is the death of bone tissue due to vascular compromise of the medial femoral circumflex artery, which supplies the femoral head. It is a degenerative condition that typically affects the epiphysis of bones. While AVN can occur in the shoulder, elbow, or ankle, it most commonly occurs in the hips.[23] AVN most commonly affects adults aged 30 to 65 years but can present in all ages. Risk factors for AVN include alcoholism, AIDs, steroids, sickle cell disease, lupus, Gaucher disease, pancreatitis, trauma, infection, and Caisson disease. Symptoms can vary greatly, with AVN being discovered incidentally without any symptoms of debilitating hip pain; however, there are no physical exam findings specific to AVN.[24]

Early diagnosis of AVN can be joint-sparing but is often not visible on radiographs in early disease; early diagnosis usually requires MRI or CT25 (Figure 4). Staging of AVN utilizes the Steinberg classification, a modified version of Ficat staging, ranging from stage zero to stage six based on findings of X-ray and MRI.[26] Surgical intervention is indicated beginning at stage 3 in which there is evidence of subchondral collapse that demonstrates a crescent sign on imaging. Core decompression of the femoral head with or without stem cell placement had been the treatment for precollapse staging (stages 0-2) to alleviate pressure and increase blood flow in the femoral head.[27] However, left untreated, collapse of the hip joint can occur within a few months or years. If the joint collapses, the most effective treatment is total hip replacement surgery. If diagnosed early, nonsurgical treatments such as NSAIDs, injections, and physical therapy may help slow progression, but there is no curative treatment.

FIGURE 4:

Anteroposterior radiograph (I) and CT (II) of the femoral head demonstrate collapsing of the femoral head consistent with advanced AVN.



TRANSIENT SYNOVITIS

Transient synovitis, also known as toxic synovitis, is a benign and self-limiting cause of acute hip pain, often in children. It is also the most common cause of acute hip pain in children aged 3 to 10 years.[28] Transient synovitis occurs most commonly in one hip as a result of inflammation and edema of the tissues around the hip joint. Male patients are affected more commonly than female patients. Patients will typically present with pain in the affected hip that may result in a painful limp or inability to stand on that leg. Patients may resist movement in the hip and favor external rotation of the hip with knees flexed to reduce pressure on the joint.

It is essential to distinguish transient synovitis from other conditions, including septic arthritis, osteomyelitis, and pyomyositis. Thus, transient synovitis is often a diagnosis of exclusion. The gold standard to rule out septic arthritis is an invasive hip arthrocentesis.[29] Clinical risk algorithms, including the Kocher criteria, have been used to determine and prevent arthrocentesis in low-risk patients for septic arthritis.[30] Kocher criteria utilize white blood cell count >12,000 cells/mm3, erythrocyte sedimentation rate greater than 40 mm/h, weight-bearing status, and a fever greater than 101.3 degrees Fahrenheit as predictive markers. Hip X-rays may also be completed. While ultrasound as an imaging modality is becoming more commonly used, effusion does not directly distinguish between transient synovitis and septic arthritis.[31] If all these studies return without abnormal findings, a diagnosis of transient synovitis can be determined.

Conservative management is the treatment of transient synovitis. This may include rest, heating, and oral NSAIDs to reduce inflammation and edema around the hip. The patient's symptoms typically resolve in 3 to 4 days with a complete return to regular activity. If pathology is clinically suspected, follow-up X-rays of the hip can be done approximately 6 months after the resolution of symptoms to rule out any pathology. diagnosis of CLTI is made, vascular surgery should be consulted and preparations for bypass surgery made.

SLIPPED CAPITAL FEMORAL EPIPHYSIS

Slipped capital femoral epiphysis (SCFE) is the most common hip disorder in adolescents, typically from age 8 to 15 years. SCFE is an inferior and posterior slippage of the proximal femoral epiphysis on the femoral neck (metaphysis). It is associated with growth spurts, obesity, and less commonly with hypothyroidism, hypogonadism, and growth hormone supplementation. SCFE is more common in boys than girls. SCFE can present in bilateral hips simultaneously or sequentially in up to 50% of patients.[32] A patient presenting with SCFE typically endorses limping and poorly localized hip, groin, thigh, or knee pain. Specific exam findings that may be more suggestive of SCFE include decreased internal rotation of the hip and Drehmann sign.[33] Drehmann sign is positive when a patient is asked to flex their hip, and it automatically abducts and externally rotates.

SCFE is classified based on the stability of the physis. A SCFE is defined as stable if the patient can ambulate with or without crutches. It is considered unstable if the patient cannot ambulate, even using crutches. Bilateral hip radiography confirms the diagnosis. Both stable and unstable utilize anteroposterior views for diagnosis of SCFE; however, secondary views differ depending on whether the SCFE is stable or unstable. For stable SCFE, an AP view of bilateral hips should be done in addition to a frog-leg view. Alternatively, unstable SCFE should be confirmed with an AP view of bilateral hips and cross-table lateral views. It is important to compare the findings with those of the uninvolved side.

Upon confirmation of SCFE, treatment involves urgently referring to an orthopedic surgeon. The patient is to be placed in a wheelchair or non–weight-bearing crutches. It is critical not to attempt a manual relocation of the metaphysis as these maneuvers can result in AVN. For patients with stable SCFE, surgical stabilization is completed by in situ fixation with a single screw.34 The goals of unstable SCFE treatment are similar to in situ fixation; however, the approach for unstable SCFE focuses on aligning the proximal femur to decrease the rate of future femoroacetabular impingement syndrome for the patient. Postsurgical rehabilitation is a multistage approach emphasizing returning the patient to a normal gait and activity within the time frame set by the orthopedic surgeon. Stable SCFE patients can typically return to sports or significant activity following the closure of their growth plate.

DEVELOPMENTAL DYSPLASIA OF THE HIP

Previously called congenital hip dislocation, developmental dysplasia of the hip (DDH) is a pediatric disorder defined as an abnormality in the size, shape, orientation, or organization of the acetabulum, femoral head, or both. DDH refers to a spectrum of abnormalities in the immature hip ranging from minor dysplasia to full hip dislocation. Dysplasia of the acetabulum can result in a subluxed or dislocated hip. A hip is considered subluxed if the femoral head is displaced but is still making contact with a portion of the acetabulum. On the other hand, a dislocated hip has no contact between the acetabulum and the articular surface of the femoral head.[35] Both processes can lead to early degenerative joint disease. The most commonly affected patient group is firstborn females born in the breech position.[36] Additionally, family history is a risk factor for DDH. The left hip is affected more frequently in 60% of children. This is likely due to the left hip being adducted against the mother's lumbrosacral spine in the most common intrauterine position, the left occiput anterior position.[37]

In younger patients with DDH, the typical presentation includes palpable hip instability, unequal leg lengths, asymmetric thigh skinfolds, and a positive Allis sign. The Allis sign is considered positive if the knees are unequal heights when the hips and knees are flexed with the affected side having a lower knee.[38] In older children with DDH, gait abnormalities and limited hip abduction may occur. Physical examination and imaging are utilized in making a diagnosis of DDH. Special physical examination testing includes the Barlow and Ortolani maneuvers. The Barlow maneuver is completed when posterior pressure is placed on the inner aspect of the abducted thigh, and then the hip is adducted. It is considered positive when an audible "clunk" is heard, suggesting posteriorly dislocation of the femoral head. The Ortolani maneuver is completed when the thighs are softly adducted from the midline with anterior pressure on the greater trochanter. The test is considered positive when a soft click signifies a reduction of the femoral head into the acetabulum. Both Ortolani and Barlow maneuvers should only be completed at 3 months and younger due to difficulties with interpretations of the test.[38] If they are inconclusive, the patient should return in 2 weeks for further evaluation.

The radiographic examination will differ depending on age. Given the lack of ossification of the femoral head in patients under 6 months, ultrasonography is the imaging modality of choice for patients under 6 months old. However, it is overly sensitive as a screening tool in the first 6 weeks of life and should be avoided in these patient populations. Anteroposterior radiographs are most valuable for patients over 4 to 6 months old.[39] Multiple reference lines and angles are used to evaluate radiographic confirmation of DDH, including Hilgenreiner's and Perkin's lines. It is important to note that the United States Preventive Services Task Force (USPSTF) has concluded against routine screening for DDH, as the majority of DDH resolve spontaneously and require no intervention.[40]

Treatment goals for DDH include maintaining a reduction of the femoral head in the true acetabulum. In patients under 6 months, a Pavlik harness may maintain the hips in a flexed and abducted position. The hips should not be flexed over 60 degrees to reduce the risk of AVN and femoral nerve palsies. Ultrasonography should be completed after 3 weeks to confirm hip reduction and continued for at least 6 weeks. A spica cast may be used in patients aged 6 to 15 months.[41] If these treatments are unsuccessful or the patient is over 15 months, an open reduction should be completed, but surgical intervention becomes technically challenging as the patient ages.

LUMBAR AND SACROILIAC INVOLVEMENT

It is important to consider lumbar and sacroiliac causes when evaluating a patient with hip pain complaints. There are challenges to distinguishing between localized hip pain and pain referred from lumbar or sacral pathologies. Lumbar spinal dysfunctions can present as hip pain, most commonly in the posterior hip. Patients typically present with pain in the lumbar spine and the posterior hip and buttock. Patients may or may not report previous lumbar spinal trauma or diagnoses. Sacroiliac joint dysfunction may also present with posterior hip pain with tenderness to palpation directly along the affected sacroiliac joint. For both lumbar and sacral disorders, radiography will be the first line to evaluate for degenerative disease or arthritis. If inconclusive, advanced imaging such as MRI can be done to identify nerve involvement, disk herniation, or inflammation.[42]

CONCLUSION

The 12 hip disorders reviewed in this article signify some of the most common adult and pediatric hip diagnoses encountered in the primary care setting; however, this is not all-inclusive of various hip disorders. Reviewing these disorders can help to discern what can be managed in the primary care setting or when referral to a specialist is necessary.

LITERATURE SEARCH AND DATA SOURCES

While preparing this article, the search strategy involved reviewing primary research published online, communicating with primary care physicians and specialists to optimize the diagnoses chosen, and a thorough review of osteopathic techniques reviewed in the "Atlas of Osteopathic Techniques." Keywords were specific to the 12 diagnoses reviewed, including "osteoarthritis," "hip dislocation," "avascular necrosis," etc. Search dates for this research were conducted from 8/1/2023-11/15/2023. Cochrane and clinical evidence were used to determine sources that were up to date and relevant to the topics.

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