THE UNIVERSITY OF TOLEDO MEDICAL CENTER

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THE UNIVERSITY OF TOLEDO MEDICAL CENTER
ORTHOPAEDIC MONTHLY

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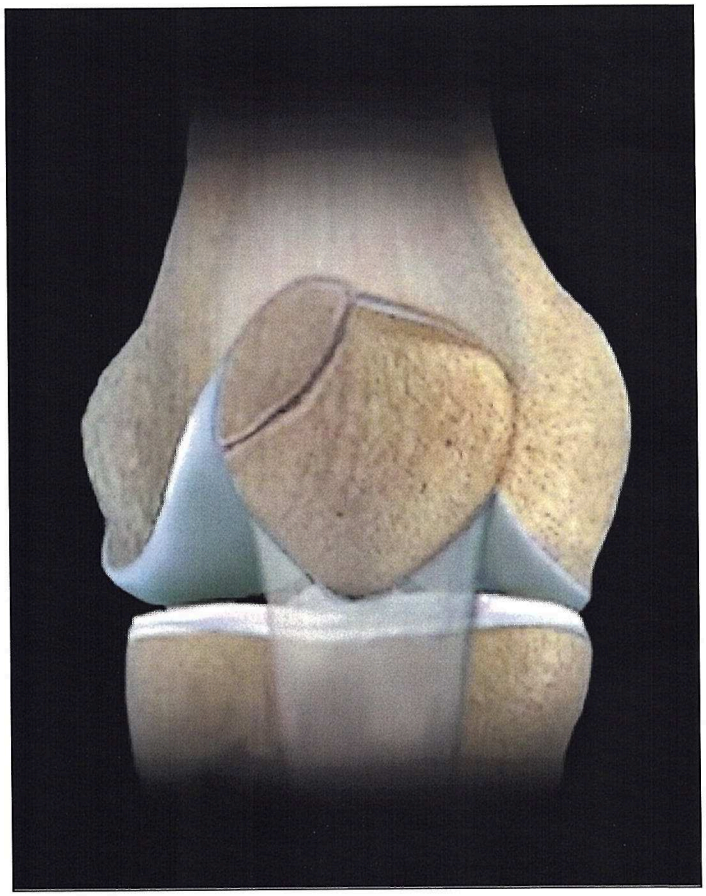
Bipartite Patella



Bipartite patella is a failure of the ossification centers of the patella to fuse. Common types of bipartite patella include inferior pole, lateral margin, and superolateral pole. The accessory ossification center at the superolateral pole remains unfused. In the cases of bipartite patella, you can see that the patella has two parts: the smaller part is rounded and usually located laterally. It can be confused with a fracture. The superolateral pole is the most common type (occurs in about 75% of patients). Try to get an x-ray of the other knee (it is bilateral in about 50% of the time). Skyline view x-ray with a squatting position (weight-bearing) may show displacement and increased separation of the fragment. The bipartite patella is usually asymptomatic, and it is usually an incidental finding on the x-ray. It may cause symptoms that mimic those of a fracture. Minor trauma or injury can cause the fibrous tissue between the two segments to become inflamed and irritated. It can present as localized tenderness over the separated fragments, usually the superolateral part of the patella. The most common presentation is pain at the area of the separated fragments, especially during or after heavy physical activity or sports. It is usually asymptomatic and does not require treatment or surgery. In general, the most common error with bipartite patella is mistaking the condition for a fracture and fixing it (the patient really does not need surgery). Treatment is usually reassurance and observation, rest, knee immobilizer, physical therapy, and nonsteroidal anti-inflammatory medication (NSAID). Nonoperative treatment should be done for at least 6 months. These patients will improve without surgery. Surgery is rare, and it is excision of the fragment if the fragment is small. If the fragment is large, painful, and conservative treatment fails, then you can do lateral release of the retinaculum to reduce the traction force on the unfused, smaller fragment. Internal fixation and possible bone graft is rarely done if the fragment is large and painful.

Hip Fractures Mechanism of Injury

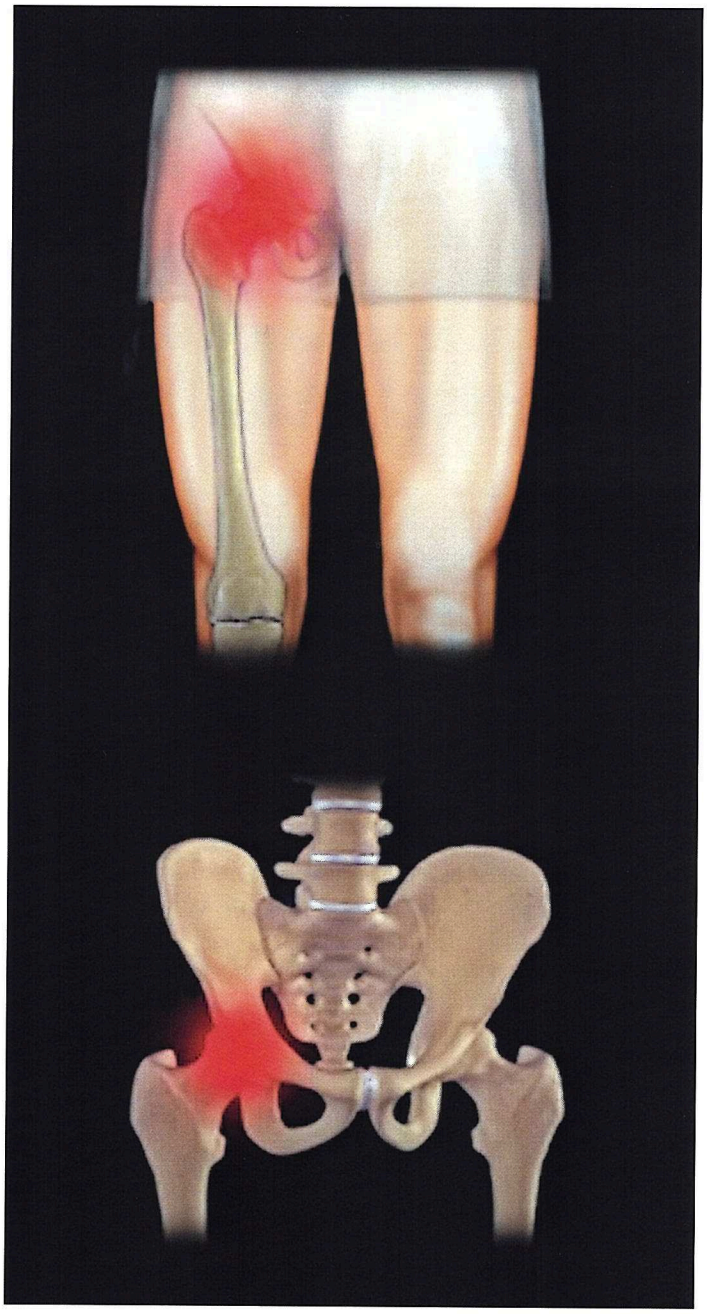
Low energy fracture occurs in the elderly from a fall onto the greater trochanter. A fall in the elderly is different than a fall in the young. The young will try to protect themselves by falling on the wrist. Wrist fracture occurs in the younger group more than fracture of the hip. High energy fractures can occur in both the young or the elderly form either a fall or a car accident. Stress fractures can occur in athletes. Insufficiency fracture occurs in the elderly. Insufficiency fractures in the elderly are usually occult.

Causes of Hip Pain

Pain can arise from the structures that are within the hip joint or from the structures surrounding the hip joint. The most important thing is to ask the patient to locate the site of pain. Ask the patient to point at the site of pain. When the patient states that their hip hurts, it doesn't mean that the pain is coming from the hip joint itself, so ask the patient to point at the site of the pain. The pain can arise from structures that are within the hip joint or from structures surrounding the hip. The hip joint is a weight bearing joint. The joint consists of two main parts: femoral head (ball) and acetabulum (socket). The hip pain can be anterior hip pain (deep groin pain). The pain can be lateral hip pain. The pain can be posterior hip pain. The pain can be far posterior hip pain, coming from the sacroiliac joint and the lower spine.

Anterior hip pain is usually deep within the groin, and it can result due to arthritis of the hip. Arthritis of the hip is diagnosed by x-ray. Conservative treatment is physical therapy, anti-inflammatory medication, possible injections, and surgery is done in late cases, usually by total hip replacement. Labral tear of the hip is usually diagnosed by clinical examination with a provocative test of flexion, adduction, and internal rotation. The diagnosis is confirmed by an MRI arthrogram. Conservative treatment of labral tears is therapy, anti-inflammatory medication, and injections. Surgical treatment provides a good result and is usually done by arthroscopic debridement or repair of the tear. Stress fracture is usually diagnosed by an MRI. The x-ray may be normal. Early diagnosis is important before the fracture displaces and gives a bad result. Treatment of avascular necrosis is usually surgical fixation of the fracture. Fixation of the fracture is usually performed utilizing screws. Femoral head replacement is done in rare, late cases. Avascular necrosis means death of a segment of the bone. When the blood supply of the femoral head is interrupted, a segment of the bone dies and becomes necrotic (femoral head will collapse). Treatment for early stages of AVN without collapse of the femoral head include decompression by drilling of this segment in the femoral head to bring a new blood supply to the area. Vascularized fibular graft may be used also. In severe cases with collapse of the femoral head (usually diagnosed by an x-ray), the treatment is usually total hip replacement. Treatment of an inflamed bursa is usually conservative treatment of physical therapy, anti-inflammatory medication, and injection. Surgical treatment by excision of the bursa is rarely done. In case of chronic, resilient trochanteric bursitis, try to get an MRI to exclude a tear of the abductor muscles of the hip (gluteus medius and gluteus minimus muscle tear).

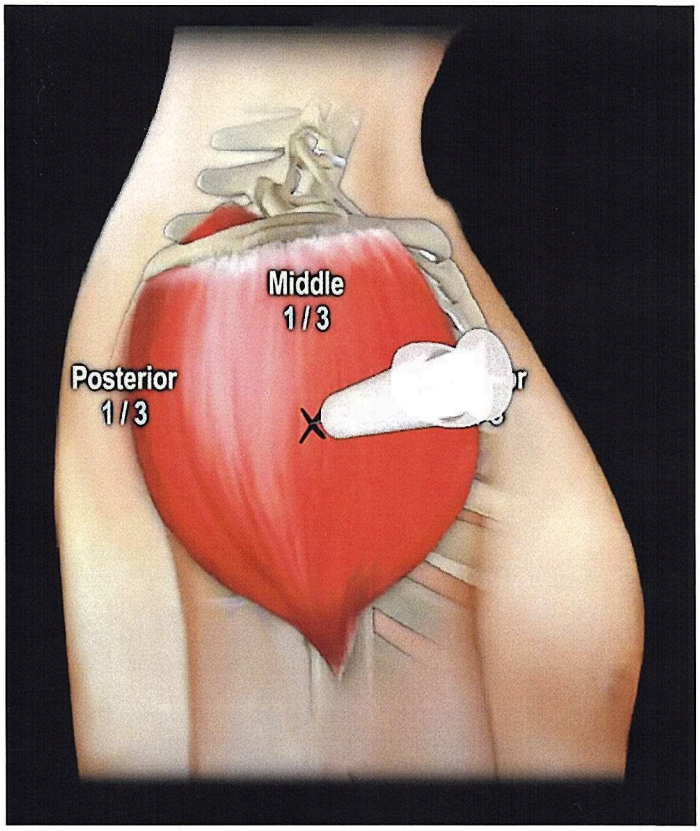
Posterior hip pain is usually due to piriformis syndrome. The sciatic nerve can be irritated from the piriformis syndrome. Treatment is usually physical therapy, stretching, anti-inflammatory medications, and injections. Surgical treatment is usually rare. It is the last resort. It includes release of the piriformis tendon and exploration of the sciatic nerve. It is done in cases that fail to improve with conservative treatment. Far posterior pain may come from the sacroiliac joint or from the lower spine conditions. Sacroiliac joint (SI) problems is a challenging diagnostic and treatment entity. There are a lot of clinical diagnostic examinations that can be used to diagnose



sacroiliac joint (SI) problems such as the Faber test and others. However, injection of the SI joint is probably the method to diagnose pain originating from the SI joint. If there is improvement of the condition of the patient after injection of the SI Joint, then we will probably consider that the problem is in the SI joint. The SI joint problems are usually under estimated and are unappreciated. Lower spine conditions can cause referred pain to the buttock and hip area. In fact, symptoms of hip and lower spine conditions can overlap or both of them can coexist in the same patient. You have to separate pain from the hip from pain that comes from the spine.

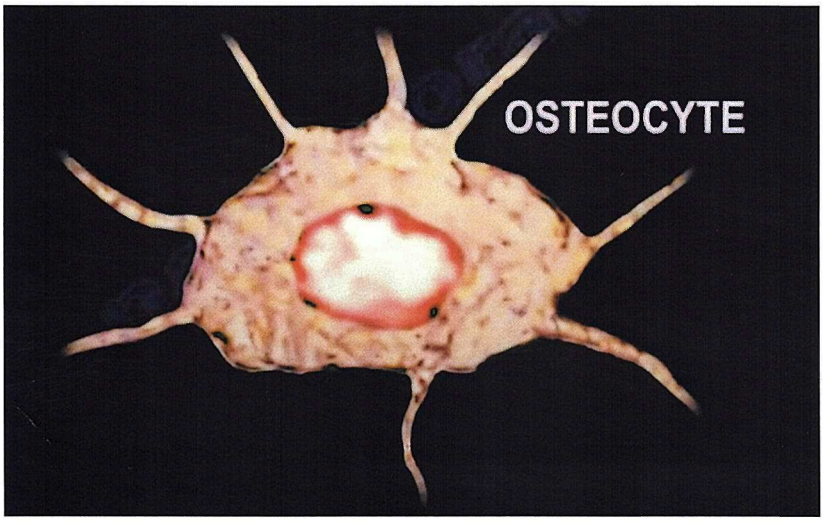
Deltoid Injection for Vaccination

The deltoid intramuscular injection is a common procedure. One must be aware of the proper location for the injection and the proximity of the neurovascular structures present within the involved region. The size of the deltoid mass is small in relationship to other IM injection sites (this leaves a small margin for error at the deltoid site for injection). Deltoid injection is ideal for administering vaccinations. Accurate identification of the safe zone for injection is important. The correct location for the injection is in the middle part of the deltoid muscle from the side view. The acromion process is a great landmark to help in selecting the proper site for injection. Identify the acromion and go about 2.5cm to 5cm below the acromion (ideal site for injection), which is about 1-2 inches below the acromion. For deltoid intramuscular injection, you can use the square method or the triangle method. Both methods are about the same. If you superimpose both injection techniques, the ideal site for injection remains about the same. Some people may make a triangle with the fingers as shown here in order to have a proper location for the injection. You can see that the top finger is over the acromion process. Inferiorly, there is less of a safe zone due to the close proximity of the neurovascular bundle to the inferior part of the deltoid. Care must be given not to cause injury to the axillary nerve and the radial nerve during intramuscular injection of the deltoid muscle. The axillary nerve runs transversely from posterior to anterior about 7cm distal to the acromion. The injection site should not exceed 5cm distal to the acromion because this is the danger zone and the axillary nerve can be injured.



Osteocytes

Our skeleton contains billions of osteocytes. The osteocytes account for 90% of cells in the skeleton. Osteocytes develop from the mesenchymal stem cells through osteoblast differentiation. The osteocyte is different from the other two types of bone cells (osteoblast and osteoclast). Osteocytes are living cells buried in inorganic mineralized matrix, and there is remodeling of the bone to keep the balance between making the bone by osteoblasts and removing the bone by osteoclasts. Factors affecting remodeling of bone include circulatory, metabolic, and mechanical (very important factor). The osteocytes maintain mature bone and cellular matrix. It is important in regulating calcium and phosphate concentrations in the bone. Osteoblasts produce osteoid and deposits osteoid around itself. This osteoid is composed predominantly of Type I collagen. The mature osteoblast gets trapped in the matrix that they produce, and they make the osteocyte. The osteocyte is less metabolically active than the osteoblast, and it has a higher nucleus to cytoplasm ratio. The osteocytes are buried in bone in its lacunae. The osteocyte has a large nucleus with less cytoplasm and filamentous cellular processes called dentrites. Each dentrite entering a channel called canaliculus. The osteocyte communicates with adjacent osteocytes through gap junctions in the canaliculi. Osteocytes live for decades and are responsible for multiple tasks. Osteocytes are mechanosensory cells that coordinate mechanical adaptive responses. The osteocytes are connected to each other by cell processes in the bone (canaliculi) and send signals to other cells in response to mechanical stimuli to increase bone remodeling in areas of maximum mechanical stress. The osteocyte is a regulator of bone remodeling by controlling the osteoclasts and the osteoblasts. The osteocyte is stimulated by calcitonin, and it is inhibited by PTH (the osteoblast is stimulated by PTH).



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Student Corner

Achilles Tendon Rupture By Sreeram Ravi, MD Candidate 2022

The Achilles tendon is the largest tendon in the body and is formed by the confluence of the soleus muscle tendon and the tendons from the medial and lateral heads of the gastrocnemius muscle. These muscles work to plantarflex the foot at the ankle joint. Although relatively rare in the general population, incidence tends to rise in athletes. Achilles tendon rupture is more common in males between the ages of 30 and 50. Common risk factors for Achilles tendon injuries are fluoroquinolone use, prior intratendinous degeneration, steroid injection and inflammatory arthritides. Extreme pronation of the ankle places enormous stress on the tendon and can also lead to a higher risk of rupture. When rupturing the Achilles, patients may hear a pop followed by sharp pain in the region of the Achilles tendon. They have difficulty standing on their toes, plantarflexing the ankle and may have signs of bruising. The Thompson test can be performed to suggest Achilles rupture. The test is performed with the patient prone and the knee flexed 90 degrees or prone with the knee extended. The examiner squeezes the calf and notes the presence of plantarflexion at the ankle. Radiographs may be used to rule out other pathology, and MRI may be used for equivocal exam findings. Initial management involves rest, pain control and functional bracing. Studies have shown good results with both operative and nonoperative treatments with the major difference being an increased risk of wound healing complications and sural nerve injury in operative treatment and rerupture in the nonoperative treatment. Nonoperative treatment typically consists of immobilization via bracing or casting and non-weight bearing followed by functional rehabilitation. Operative treatment has a variety of approaches with the chief goal being to reapproximate the separated ends; some techniques also utilize plantaris tendon or gastrocsoleus aponeurosis to bolster the existing tendon. For most patients, prognosis is excellent but residual range of motion deficits may exist.

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