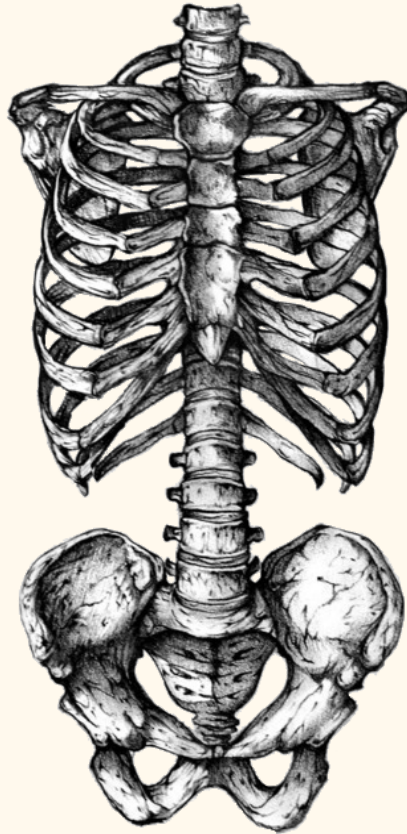


Lecture 10

Sports and Soft Tissue injuries



Objectives

- 1-Specify the symptoms, signs and potential immediate complications of common sport and soft tissues injuries involving muscles, tendons, and ligaments for commonly injured joints; like shoulder, knee, and ankle.
- 2-Outline the assessment and appropriate investigation and immediate and long term management of patients with muscles, tendons, ligaments and meniscus injuries.
- 3-Demonstrate knowledge of nonoperative and operative measurements used for sport/soft tissue injuries and their indications.

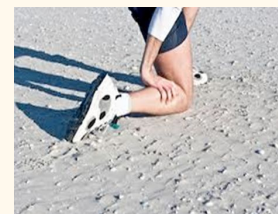
Soft tissues injuries

<ul style="list-style-type: none"> • Muscle • Tendon • Meniscus • Ligament 	<ul style="list-style-type: none"> • Knee • Shoulder • Ankle
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R.I.C.E We apply it as an initial treatment (not a definitive treatment)			
Rest 	Ice 	Compression 	Elevation 

Muscle injury:

- The muscles most at risk are those in which the origin and the insertion cross **two joints**.
- Frequently injured muscles act in an **eccentric** fashion (i.e., lengthening as they contract).
 1. Muscle strain
 2. Muscle Contusion
 3. Muscle Laceration
 4. Delayed-onset soreness



- Where does the injury happen (or located)? Middle of a muscle, myotendinous junction [between muscle and the beginning of the tendon] or at the end of a tendon [where the tendon attached to the bone].

- High risk if the muscle crosses 2 joints, and the long muscle fibers [tall people have a high risk]
- Tall people takes more time to warm up compared to short people, even in the treatment and rehabilitation they take more time.
- The most commonly injured muscles that cross 2 joints: Hamstring muscle, then calf muscle.
- If you are dealing with soft tissue injury (first thing you start with ice, elevating, compression until the right help comes)
- It is wrong to do physiotherapy in acute stage injuries. If the pain is relieved then we can do physiotherapy especially if the pain was near the joint, and for athletes they can start isometric exercise.
- Ideally you don't start physiotherapy until the swelling is resolved.

1-Muscle Strain:

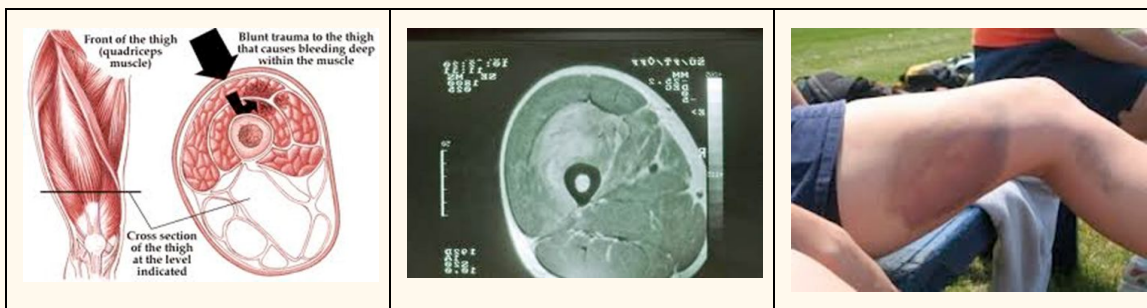
- The most common muscle injury suffered in sports.
- Immediate pain associated with diminished function.
- Both complete and incomplete muscle tears can occur by passive stretch of an activated muscle.
- Muscle tears also typically occur at or near to the myotendinous junction
- Treatment:
 - RICE
 - NSAID
 - Physical therapy

- Sprain & strain: stretching of muscle fibers.

2-Muscle Contusion:

- Caused by a nonpenetrating blunt injury (direct blow) to the muscle resulting in hematoma and inflammation.
- Quadriceps and Brachialis muscles are common involved regions.
- Clinical features:
 - Pain with active and passive motion +/- swelling.
 - Decreased range of motion of joints spanned by the injured muscles.
 - Occasionally a permanent palpable mass.
- Treatment:

- Short period of immobilization
- Followed by early mobilization and Physiotherapy
- NSAID



- Usually it affect the thigh region (bulky area).
- Sometimes there is a collection of fluid (hematoma) with contusion, and if it wasn't treated the patient will not feel the hematoma (especially obese people will not feel the swelling) and after a while he may feel something hard, And after investigation it shows myositis ossificans = fluid of the swelling become solid and resemble the bone (calcification in the muscle).
- We ask patient about previous trauma or hits. To differentiate between myositis ossificans and sarcoma.
- Contusion is reversible if treated early, and if we didn't will become irreversible.
- How to treat contusion? Rice + [no physiotherapy at the beginning because we need the muscle fibers to relaxed]

3-Muscle Laceration:

I&D [incision & drainage: to release pus or pressure under skin] followed by suture repair of the fascia, if possible.

4-Delayed-onset soreness:

- Structural muscle injury leads to progressive edema formation and resultant increased intramuscular pressure.
- Clinical features: muscular pain that occurs 1-3 days after vigorous exercise.
- Treatment :
 - Will resolve in a few days
 - NSAID

- if someone does unusual activity and the next day he felt pain. It has psychological factors and more related to younger age.

Complications of muscle injuries:

- Scar formation and muscle weakness.

- Not the skin scars that we are afraid of, instead we're afraid of muscle scars like quadriceps, triceps, biceps, and deltoid. And we're afraid if the scar was in the middle of the muscle, why? Destroy the muscle = no contraction. We treat it by surgery (trim it and resuture it in a way that the function of the muscle return.)
- If we didn't treat a 3rd degree injury and let it heal by itself there will be a gap in the injured muscle.

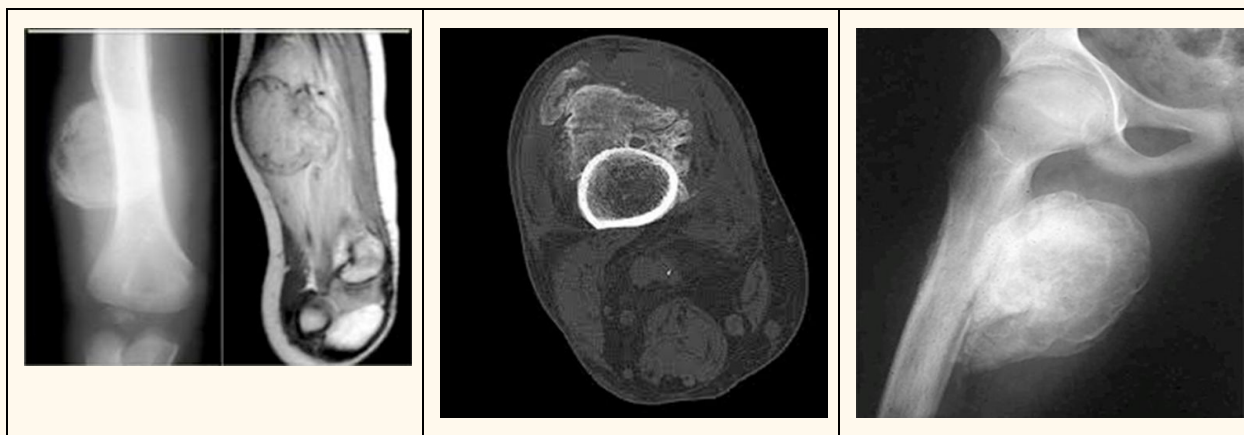
- **Compartment syndrome:** At the level of the muscle fibers, capillary bleeding and edema can lead to hematoma formation and can cause compartment syndrome in areas in which the volume is limited by the fascial envelope. Patients with Bleeding disorders are at high risk.

- How many compartments in the leg? 3 compartments(or 4 if we've divided the posterior) 1-anterior 2-lateral 3-posterior [superficial and deep]
How many compartments in the thigh? 3 compartments 1-anterior 2-posterior 3-medial.
- Anterior: femoral nerve + muscles[sartorius + articularis genu + quadriceps: rectus femoris, vastus lateralis, vastus intermedius, vastus medialis] + vessels[superficial profundus]
- Medial: obturator nerve + muscles[gracilis + adductors=longus, brevis, minimus] + femoral artery
- Posterior: sciatic nerve + muscles[hamstrings= semimembranosus, semitendinosus, biceps femoris]

- **Myositis ossificans:** deep contusion + the swelling becomes solid
 - Bone formation within muscle secondary to blunt trauma.
 - Clinical Features:

Early:	Late:
Pain, swelling and decreased ROM Erythema, warmth, induration, tenderness,	painless swelling with decreased ROM

- This sometimes mimics osteogenic sarcoma on radiographs and biopsy.
- Increased ESR and serum alkaline phosphatase
- Myositis ossificans becomes apparent approximately 2 to 4 weeks post-injury.



Overuse Tendon injuries:

- Function—To transfer force from muscle to bone to produce joint motion.
- Type of injuries:
 - Overuse tendinopathies
 - Tendon rupture

1-Overuse tendinopathies:

- Osteotendinous junction is the most common site of overuse tendon injury.
- Tendons are relatively hypovascular proximal to the tendon insertion. This hypovascularity may predispose the tendon to hypoxic tendon degeneration and has been implicated in the etiology of tendinopathies.
- Tendinopathy not tendonitis.

Most Common Diagnoses and Locations of Chronic Tendinopathies:

Diagnosis	Location
Rotator cuff Tendinopathy	Supraspinatus tendon insertion
Lateral epicondylitis (tennis elbow)	Common wrist extensor tendon origin (mainly involved ECRB)
Medial epicondylitis (“golfer’s elbow”)	Common wrist flexor tendon origin
Hamstring Tendinopathy	Hamstring tendon origin

Quadriceps Tendinopathy	Quadriceps tendon insertion
Patellar Tendinopathy (jumper's knee)	Patellar tendon origin
De Quervain's disease	Sheath/pulley of abductor pollicis longus
Achilles Tendinopathy	Sheath, midsubstance, or calcaneal insertion

Treatment:

- Goal: reduce pain and return function.
- Mainly is **conservative** Rx
 - Rest
 - Ice (Cryotherapy)
 - Physiotherapy (stretching and eccentric strengthening)
 - Analgesics
 - Corticosteroids injection
 - Orthotics and braces
 - Other modalities: U/S, ESWT(energy shock wave therapy)
 - Surgical treatment:
 - Failed conservative treatment (at least 3-6 months)
 - Excision of abnormal tendon tissue and performance of longitudinal tenotomies to release areas of scarring and fibrosis.

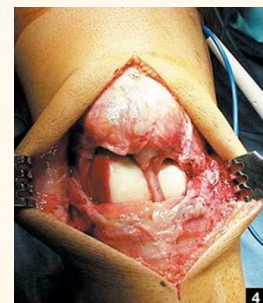
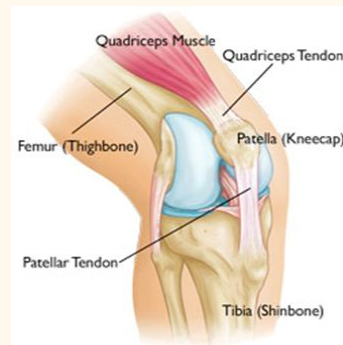
- Treatment= reshape activity (modify exercises)
- Surgery treatment is minority

2- Tendon rupture:

- Knee extensor mechanism
 - Quadriceps tendon
 - Patellar tendon
- Achilles tendon (The most tendon we are afraid of getting ruptured)
- Partial vs complete

Patellar/Quadriceps tendon rupture:

- Predisposing factors:



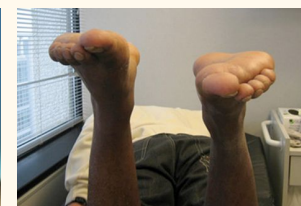
- Steroid, chronic disease, and tendinopathy
- Age: Patellar<40>Quads
- Location: at the tendon attachment to the patella.
- Physical examination:
 - Tenderness at the site of the injury, hematoma, and a palpable defect in the tendon.
 - Unable to extend the knee against resistance or to perform a straight-leg raise.
- X-ray
 - **Patella-alta** (high riding patella): Patellar tendon rupture
 - **Patella-infera** (Baja): Quadriceps rupture
- Rx: Surgical



- We don't need MRI, X-ray is more than enough
- Immobile knee(splint)= reduce movement(reduce the pain) + prevent further damage.
- Full extension to relieve the muscle from the stress

Achilles tendon rupture:

- Most ruptures (75%) occur during sporting activities.
- History:
 - The patient reports a “pop” or the sensation of being **kicked in the heel during the injury**.
 - weakness and difficulty walking.
- Examination:
 - Increased resting dorsiflexion with the knees flexed, a palpable gap, weak plantar flexion, and an abnormal Thompson test (lack of plantar flexion when squeezing the calf).
- Diagnosis is clinical, but MRI or ultrasound can confirm.
- Rx: casting or surgical



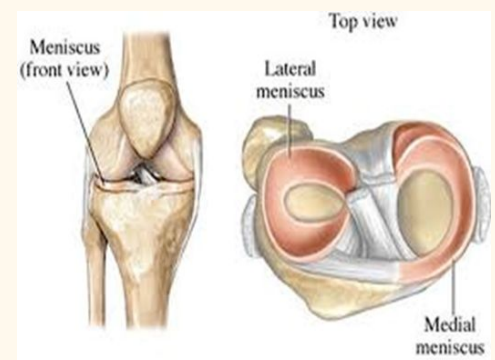
- Thompson or simmonds test=prone position then flex knee 90 degree and press on the calf muscles
- I have to compare it with the other leg.
- To confirm diagnosis we do MRI
- Cast= we don't apply it on dorsiflexion position, I applied at 5 degree plantarflexion.

Knee:

- Menisci
- ACL
- MCL
- LCL
- PCL
- Knee dislocation

1-Meniscus:

- Anatomy:
 - The menisci are crescent-shaped, with a triangular appearance on cross-section.
The lateral meniscus covers 84% of the condyle surface; it is 12 to 13 mm wide and 3 to 5 mm thick.
 - The medial meniscus is wider in diameter than the lateral meniscus; it covers 64% of the condyle surface and is 10 mm wide and 3 to 5 mm thick.

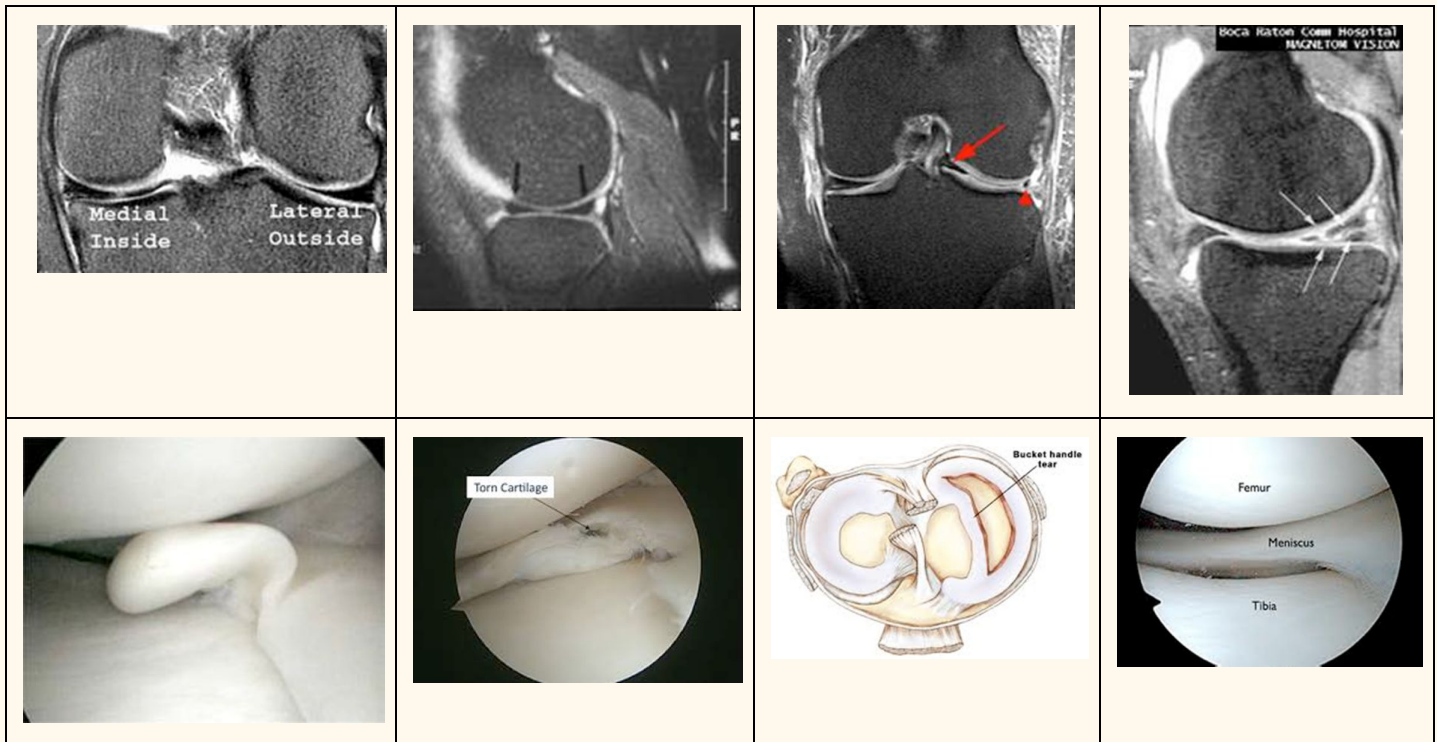


Meniscus tear:

- Meniscus function:
 - The meniscus provides stability, absorbs shock, increases articular congruity, aids in lubrication, prevents synovial impingement, and limits flexion/extension extremes.
 - The most important function of the meniscus is load-sharing across the knee joint, which it accomplishes by increasing contact area and decreasing contact stress.
- Epidemiology of meniscal injuries:
 - Meniscus injuries are among the most common injuries seen in orthopaedic practices.
 - Arthroscopic partial meniscectomy is one of the most common orthopaedic procedures.
- Incidence:
 - Meniscal tears are unusual in patients younger than age 10 years.

- Most meniscus tears in adolescents and young adults occur with a twisting injury or with a change in direction.
- Middle-aged and older adults can sustain meniscus tears from squatting or falling.
- History:
 - With an acute meniscal tear, an effusion may develop slowly several hours after injury. This differs from an anterior cruciate ligament (ACL) injury, where swelling develops rapidly within the first few hours.
 - Patients with meniscal injuries localize pain to the joint line or posterior knee and describe mechanical symptoms of locking or catching.
 - Locking (unable to fully extend the knee).
 - Chronic meniscal tears demonstrate intermittent effusions with mechanical symptoms
- Physical examination
 - Small joint effusions and **joint line tenderness** (most sensitive test) with palpation are common findings with meniscus tears.
 - Manipulative maneuvers, including the McMurray and Apley tests, may produce a palpable or audible click with localized tenderness, but they are not specific for meniscal pathology.
 - Range of motion is typically normal, but longitudinal **bucket-handle tears** may **block full extension of the knee joint**.
- Standard knee radiographs should be obtained for evaluating
 - for Bone injuries or abnormalities.
 - Osteoarthritis.
- MRI remains the noninvasive diagnostic procedure of choice for confirming meniscal pathology.

- | |
|--|
| <ul style="list-style-type: none"> ● Meniscal tear usually associated with ACL injury ● Younger age= ACL+meniscus tear ● Elderly= degenerative (affect meniscus only) ● MRI = normal =homogenous (bow tie) if not, it means there is fluid |
|--|



Differential diagnosis:

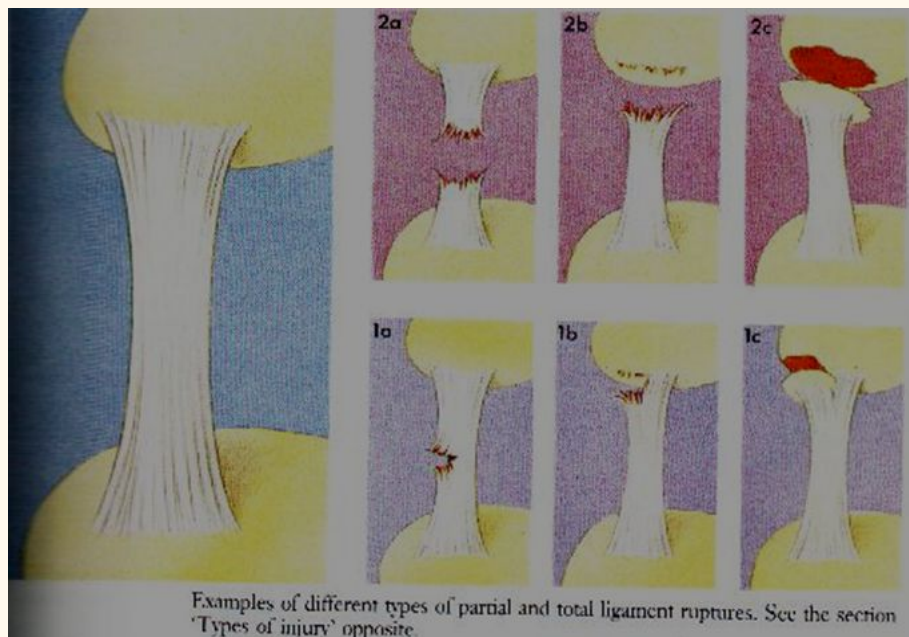
- Differential diagnosis Prior to MRI, several large studies demonstrated accuracy of the clinical diagnosis of meniscus tears to be 70% to 75%.
- The differential for meniscus tears includes intra-articular and extra-articular diagnoses.
 - Intra-articular possibilities include osteochondritis dissecans, medial patella plica, patellofemoral pain syndromes, loose bodies, pigmented villonodular synovitis, inflammatory arthropathies, and osteonecrosis.
 - Extra-articular possibilities include collateral ligament injuries, slipped capital femoral epiphysis, bone or soft-tissue tumors, osteomyelitis, synovial cyst, pes or medial collateral ligament bursitis, injury, reflex sympathetic dystrophy, lumbar radiculopathy, iliotibial band friction, and stress fracture.

Treatment:

Nonsurgical Management	Surgical Management
<ul style="list-style-type: none"> ● Not all meniscus tears cause symptoms, and many symptomatic 	<ul style="list-style-type: none"> ● Indications: <ul style="list-style-type: none"> ○ Failure of conservative

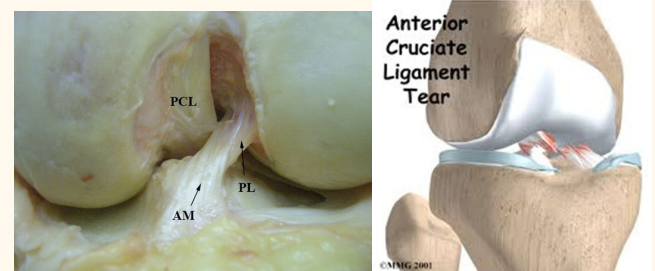
<p>tears become asymptomatic.</p> <ul style="list-style-type: none"> • Tear types that commonly may be managed nonsurgically include: <ul style="list-style-type: none"> ○ Stable longitudinal tears <10 mm in length with <3 to 5 mm displacement ○ Degenerative tears associated with significant osteoarthritis ○ Short (<3 mm in length) radial tears ○ Stable partial tears • Nonsurgical management can include ice, nonsteroidal anti-inflammatory drugs, or physical therapy for range of motion and general strengthening of the lower extremities. 	<p>treatment</p> <ul style="list-style-type: none"> ○ Locked knee ○ Concomitant ACL surgery <ul style="list-style-type: none"> • Type of surgical intervention: <ul style="list-style-type: none"> ○ Excision (Arthroscopic partial/subtotal/ or total meniscectomy) ○ Repair
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2-Ligament injury:



a. ACL injury (Anterior Cruciate Ligament) الرباط المتصلب الأمامي

- Anatomy
- Mechanism of Injury:
 - Noncontact (70%)
 - Cutting or Pivoting

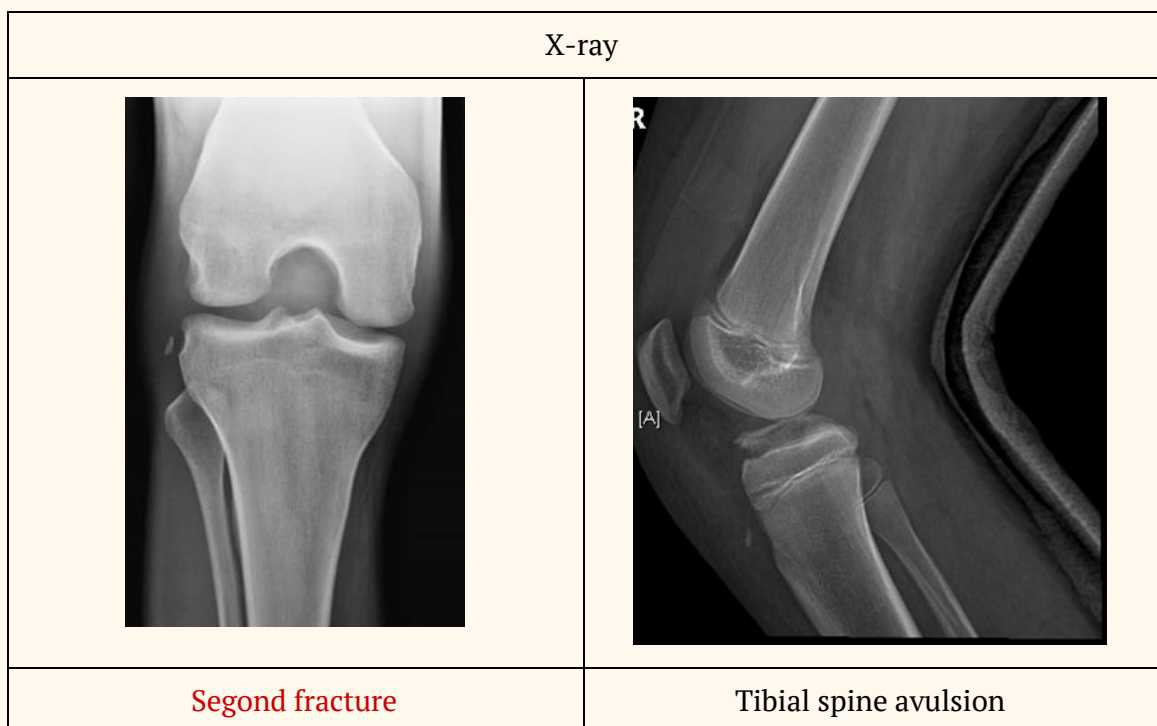


- Contact = MCL
 - Sports-Related (80%)
 - “Pop” (70%)
 - Female: 2-4x > Male
- Diagnosis:
 - Symptoms:
 - Instability “giving way episodes”
 - Swelling (Hemarthrosis) is noted immediately after the injury.
 - Pain if associated with meniscus tear
 - Physical examination
 - The patient needs to be relaxed and comfortable.
 - Must be compared with those of the normal knee.
 - A moderate to severe effusion is usually present in the acute cases
 - ROM: in acute injury the range of motion may limited by:
 - Pain
 - Effusion
 - Hamstring spasm,
 - ACL stump impingement,
 - Meniscal pathology.
 - Special tests:
 - Lachman’s test
 - Anterior Drawer test
 - Pivot shift test : is pathognomonic for ACL injury (best in the chronic setting).
 - Investigations:
 - X-ray
 - MRI
 - In the skeletally mature patient, the femoral insertion or midsubstance is usually the site of disruption.
 - In the skeletally immature patient, the tibial attachment may be avulsed with or without a piece of bone.

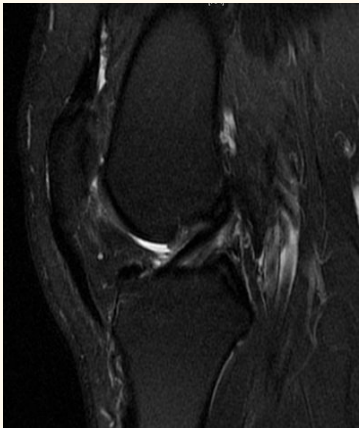

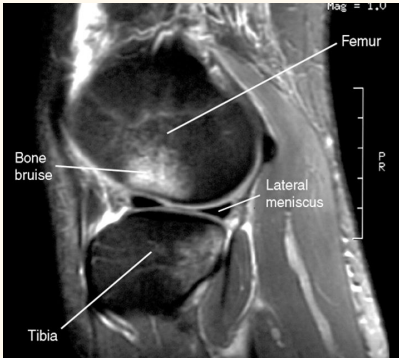
- ACL is the commonest injury between the knee ligaments especially non-contact injury, is it rare with direct trauma.
- Treatment= young age + has motivation(athlete) = surgery
- ACL the only ligament that doesn’t heal by itself if we leave it by its own
- PCL and MCL = we could wait and it will heal by itself
- Female (affect them more) 3 factors: 1-hormonal changes (if we give them

contraceptive pills the rate of injuries will decrease) 2- interchondral notch is narrower in the female 3-female loading position is valgus (stress on ACL)

- In acute stage we see bone contusion
- If we leave ACL injury without treatment it will affect the meniscus and lead to premature arthritis



From 433 teamwork: Segond Fracture is pathognomonic for ACL tear because there is a capsule and there's a ligament called anterolateral ligament, with subluxation of tibia due to ACL tear there will be avulsion fracture which is segond fracture

MRI		
		
Normal ACL	Torn ACL	Bone bruise

- Injuries associated with ACL disruption:
 - Injuries of the ACL rarely occur in isolation. The effects of other injuries, including:
 - Other ligament sprains (MCL)
 - Meniscal tears
 - Articular cartilage injuries
 - Bone bruises
 - Complicate the treatment and eventual outcomes of ACL disruptions.
- Treatment:

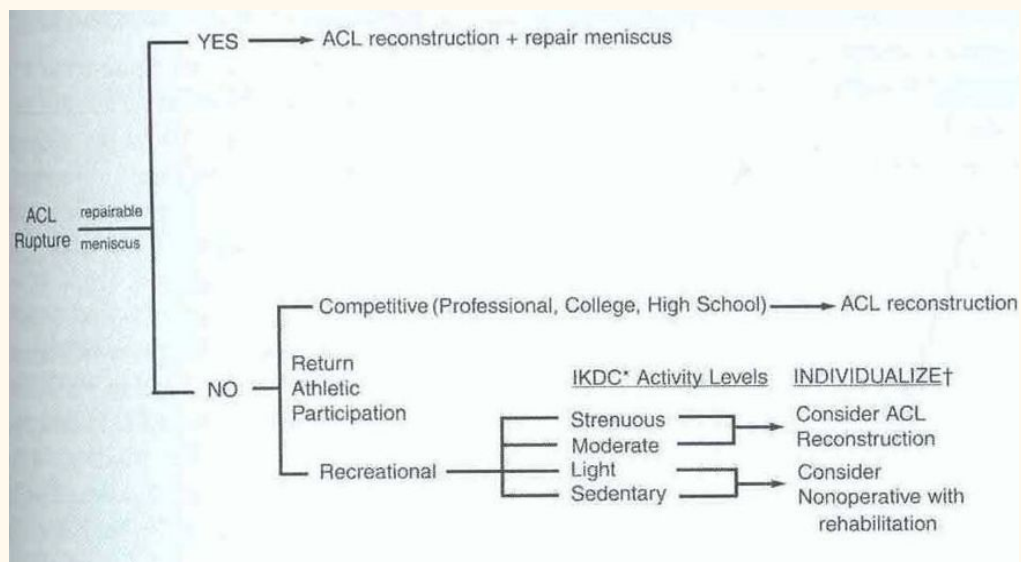
Nonsurgical treatment	Surgical
<ul style="list-style-type: none"> ● Appropriate for asymptomatic patients with partial injuries to the ACL. ● Patients who are older or less physically active may elect to modify their activities and proceed with nonsurgical treatment. If nonsurgical 	<ul style="list-style-type: none"> ● Athletes with ACL injuries rarely return to cutting and pivoting sports, such as basketball, football, soccer or squash, without first undergoing surgery. For individuals who wish to return to such sports, surgery is generally recommended to avoid

treatment fails or knee instability persists, surgery can be performed.

- Nonsurgical treatment involves rehabilitation to strengthen hamstrings and quadriceps, as well as proprioceptive training.
- Activity modification is also an important part of nonsurgical management, as patients who avoid cutting and pivoting sports are at lower risk for knee instability.
- Functional braces and simple knee sleeves improve proprioception, which may give patients a sense of improved knee function and stability.

instability and secondary meniscal and/or articular cartilage damage.

- Individuals who work in occupations that may involve physical combat, such as police officers, or risk, such as firefighters, should have ACL reconstruction before returning to work.
- Most patients can function well and perform activities of daily living (ADLs) without instability after a complete ACL injury. However, some have difficulty performing even simple ADLs because of ACL deficiency-related instability, and they may require surgery.



From 433 teamwork:

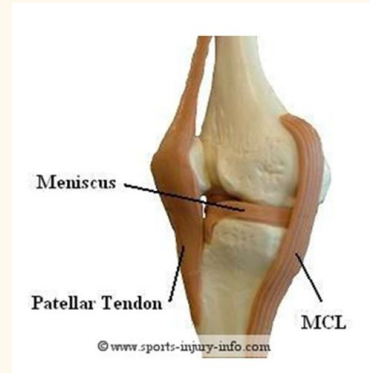
- Young "usually below 20" with torn ACL = ACL reconstruction "Surgery" even if they are not symptomatic.
- Athletes = ACL reconstruction "Surgery"
- If not athletes nor young, and if not symptomatic and have no intention of doing sports then we don't do surgery.
- Reconstruction means we remove the torn ligament and replace it by another one, we

usually take the Hamstring tendon.

- Having a meniscal tear is an indication of Surgery
- Elderly and not physically active = Non-Surgical.
- In acute stage first do initial treatment Rice physio etc.

b. MCL:

- The main function of this complex is to resist valgus and external rotation loads
- The tibial MCL is the most commonly injured ligament of the knee. The true incidence may be underestimated due to a lack of reporting for lesser grades of injury.
- Concomitant ligamentous injuries (95% are ACL) occur in 20% of grade I, 52% of grade II, and 78% of grade III injuries.
- Concurrent meniscal injuries have been noted in up to 5% of isolated medial ligamentous injuries.
- Usually result from contact injury like a direct blow to the lateral aspect of the knee.
- Can be partial or complete
- Physical examination:
 - Valgus stress test should be performed with the knee at 0° and 30° of flexion.
 - Laxity at 30°: isolated MCL
 - Laxity at both 0° and 30°: concurrent injury to the posteromedial capsule and/or cruciate ligaments.
 - Rule out associated injuries (ACL and medial meniscal tear).
- Investigation:
 - Is a clinical diagnosis and most of the time does not need further investigation.
 - If the injury is severe or suspecting associated injuries (e.g. significant knee effusion) then the MRI will be the modality of choice.
 - X-ray: to rule out fractures (e.g. lateral tibia plateau fracture)
- Treatment:



Conservative treatment	Surgical treatment:
<ul style="list-style-type: none"> ● Is the mainstay of treatment for the isolated MCL injuries ● Indications : 	<ul style="list-style-type: none"> ● If conservative treatment failed ● Grade III MCL tear ● If associated with other ligaments

<ul style="list-style-type: none"> ○ All isolated grade I and II injuries ○ Grade III injuries that are stable in extension without associated cruciate injury ● Crutches, ice, compression, elevation, and anti-inflammatory/pain medication ● No brace is usually required for grade I injuries; crutches can be used as necessary. A knee immobilizer (comfort) or hinged brace (for walking) is recommended for grade II and grade III injuries. ● Timing of return to sports is directly related to the degree of injury: Grade I injuries, 5 to 7 days; grade II injuries, 2 to 4 weeks; grade III injuries, 4 to 8 weeks. 	injury
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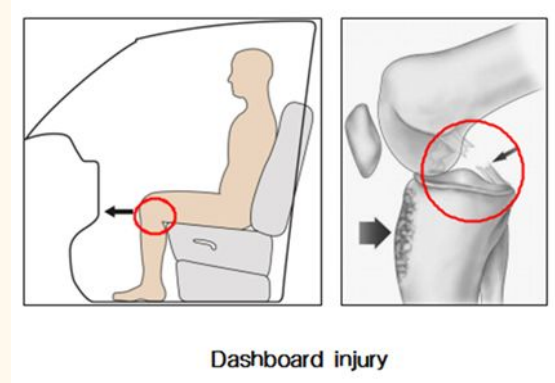
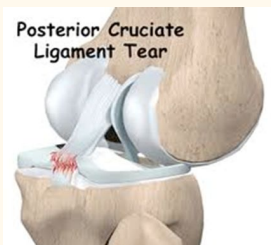
e. LCL:

- The LCL is the primary restraint to varus stress
- Less commonly injured compared to MCL
- Injuries to the lateral ligament of the knee most frequently result from motor vehicle accidents and athletic injuries.
- Rx:
 - Isolated injury: non operative
 - Combined injury: surgical

- MCL is always conservative (it can heal by itself)
- LCL we do conservative treatment but not as much as medial
- MCL and LCL we do valgus and varus stress test.
- If I push leg to outside = valgus stress test = test MCL
- If I push leg to inside = varus stress test = test LCL
- How we do examination = 2 ways: 1-at full extension (if positive not only one ligament is Involved, but plenty and it calls multiligament injury) 2-at 30 degree flexion(if it shows a positive sign it is either LCL is affected(varus stress test) or MCL (valgus stress test).
- Treatment: 1st degree conservative even in 3rd degree we start conservative but if it was associated with other ligaments or conservative is failed we do surgery.

d. PCL:

- The PCL is the primary restraint to posterior tibial translation
- Mechanism of injury:
 - A direct blow to the proximal aspect of the tibia is the most common cause of PCL injury.
 - Dashboard injury
 - In athletes>a fall onto the flexed knee with the foot in plantar flexion, which places a posterior forces on the tibia and leads to rupture of the PCL.
- PCL insufficiency significantly increased the risk of developing medial femoral condyle and patellar cartilage degeneration over time.
- Treatment:
 - Non-operative
 - Surgical if combined ligament injury



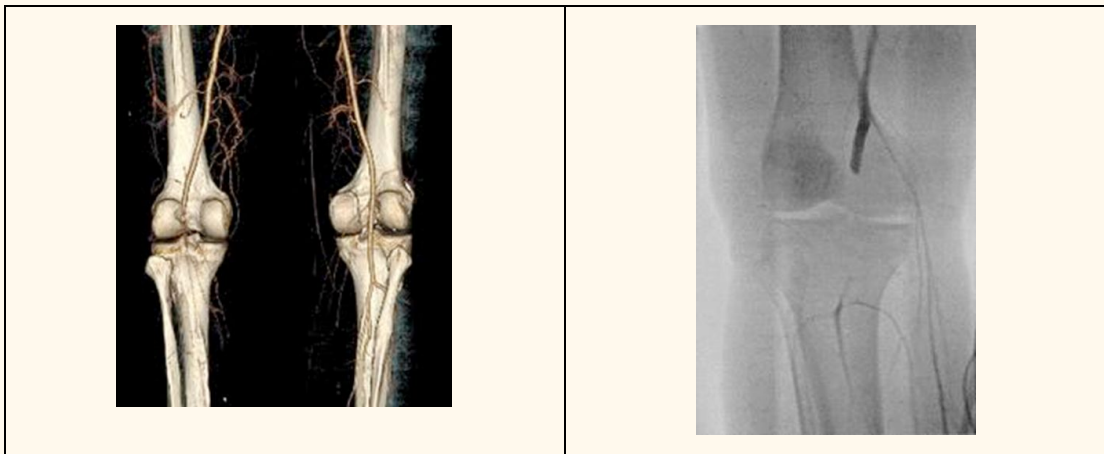
- PCL most injuries happen when a person set in front beside the driver(most dangerous seat)
- PCL is conservative until its proven otherwise
- PCL surgery is more difficult than ACL surgery
- ACL=surgical treatment is more than conservative treatment
- PCL, MCL, LCL=conservative treatment is more than surgical treatment

3-Knee dislocation (Multiligament Knee Injuries):

- Multiligament knee injuries are usually caused by high-energy trauma and are often considered knee dislocations.
- Less frequently, low-energy trauma or ultra-low-velocity trauma in obese patients can also result in this injury pattern.
- A bicruciate (ACL+PCL) injury or a multiligament knee injury involving three or more ligaments should be considered a spontaneously reduced knee dislocation.
- A knee dislocation should be considered a limb-threatening injury, and careful monitoring of vascular status after the injury is imperative.
- Popliteal artery (estimated at 32%) or peroneal nerve injury (20% to 40%) also can occur.
- Vascular examination is critical in an acutely dislocated knee.



- Pulse and ankle-brachial index (ABI) should be carefully assessed. An ABI of less than 0.90, and most certainly less than 0.80, should be considered abnormal.
- If there is any concern about an abnormal vascular examination, there should be a low threshold for ordering an angiogram.
- If pulses are still abnormal or absent following reduction of the dislocation, immediate vascular surgery consultation with intraoperative exploration should be the next step in management.
- A vascular injury in a knee dislocation is a limb-threatening injury and needs to be corrected within 6 to 8 hours. If not corrected, amputation may be required.
- Neurologic examination is also critical, as peroneal nerve injury can occur with multiligament injuries, particularly in concomitant lateral/posterolateral corner injuries.



- **NEED EMERGENT REDUCTION:** emergent closed reduction and splinting or bracing should be performed immediately. Post Reduction radiographs should be taken to confirm knee reduction.

- Knee dislocation: we do reduction + keep patient at hospital for 24 or 48 hours to check his neurovascular + we do ABI (ankle brachial index) normal range: 0.8-1.2 + we do angiogram.
- Why we test vascular? We're afraid if patient has an intimal tear (affect the vessel wall) we didn't notice it until the patient came back to the hospital with ischemic limb presentation, so we do to do ABI + angiogram
- Knee dislocation = we have to check neurovascular damage
- Most of them are high energy trauma
- We don't do angiogram while the knee is dislocated, we relocated then we do angiogram.



Ankle sprain:

- Ankle sprain is a common sports related injury.
- Lateral sprains accounting for 85% of all such injuries.
- Classification of Acute Lateral Ankle Sprains:

- **Grade 1 injuries** - the ligament is stretched, with microscopic (but not macroscopic) tearing. Swelling is mild, with little or no functional loss and no joint instability. The patient bears weight at least partially.
- **Grade 2 injuries** - the ligament is stretched with partial tearing. Swelling is moderate-to-severe, with ecchymosis. There is moderate functional loss and mild-to-moderate joint instability. Patients usually have difficulty bearing weight.
- **Grade 3 injuries** - the ligament is completely ruptured. Swelling is immediate and severe, with ecchymosis. The patient usually cannot bear weight (or not without severe pain). There is moderate-to-severe instability of the joint.

- History and physical examination:
 - History suggestive of inversion injury
 - Localized tenderness, swelling, and ecchymosis over the anterior talofibular ligament (ATFL) and/or calcaneofibular ligament (CFL).
 - Examination should localize pain to the lateral ankle.
 - The anterior drawer test may demonstrate anterior talar subluxation.
 - The talar tilt stress test may demonstrate positive tilt to inversion stress.



- Investigations:
 - X-ray ankle to R/O associated injuries (lateral process of talus, anterior process of calcaneus, and fifth metatarsal base).
 - MRI and MR arthrography can show ligamentous disruption or attenuation, but they provide no distinct advantage over physical examination.
 - MRI is most useful when looking for other pathology (peroneal tear, osteochondral lesions of the talus). Consider MRI if pain persists 8 weeks after ankle sprain.
- Associated injuries:
 - Osteochondritis dissecans lesions (15% to 25%)
 - Loose bodies (20%)
 - Peroneal pathology (up to 25%)



- Treatment:
 - Nonsurgical:
 - Initial treatment consists of rest, ice, compression, and elevation (RICE).
 - Early weight bearing and use of a protective brace during functional activities facilitates recovery better than non-weight bearing or immobilization.

- Functional instability may result and should be treated with a course of physical therapy, emphasizing isometrics and resistive training, peroneal strengthening, range of motion, and proprioceptive training.
 - Residual mechanical instability may be managed effectively with bracing or taping.
 - Patients may return to unrestricted activity when cutting, running, and hopping on the affected leg are no longer painful.
 - Ninety percent of acute ankle sprains resolve with RICE and early functional rehabilitation.
- Surgical: Surgery is a reasonable option when an adequate trial of nonsurgical treatment fails to control symptoms.



Summary (433 teamwork)

- The initial management in sport or soft tissue injury or even in other injuries is RICE (Rest - Ice - Compression - Elevation “at heart level”).
- Commonest type of muscle injury is muscle strain, treated with RICE – NSAID – PT.
- Complications of muscle injury are Scar formation lead to muscle weakness, Compartment syndrome and Myositis ossificans.
- Osteotendinous junction is the most common site of overuse tendon injury. Treatment Goal is to reduce pain and return function, mostly conservative.
- Risk Factors for quadriceps and patellar tendon rupture are: Steroids, Chronic Disease, Tendinopathy, Age (Patella<40 years>Quads) and also the location (at the attachment to

the Patella). And treatment for quadriceps and patellar tendon rupture is usually surgical.

- 75% of achilles tendon rupture Most ruptures occur during sporting activities. Usually in ankle dorsiflexion. Treated surgically.
- ACL tear commonly presented as “giving way leg”. It is treated surgically if the patient is young or athlete or a worker who tendon needs repair.
- MCL is the most commonly injured ligament of the knee, treatment is conservative unless associated with other injuries.
- LCL and PCL are treated conservatively unless surgery is needed.
- Knee dislocation is an emergency and closed reduction and splinting or bracing should be performed immediately with checking N\V before and after.
- Meniscal tear is commonly seen in orthopedics, Treatment is generally nonsurgical “conservative”. Need surgery if ACL injury is associated, if there is mechanical block, or if conservative treatment is failed.
- Ankle sprain is a common sports related injury. Lateral sprains accounting for 85% of all such injuries. Treated first by conservative, if failed we do surgery.

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