

PBL TEAM

Third Case

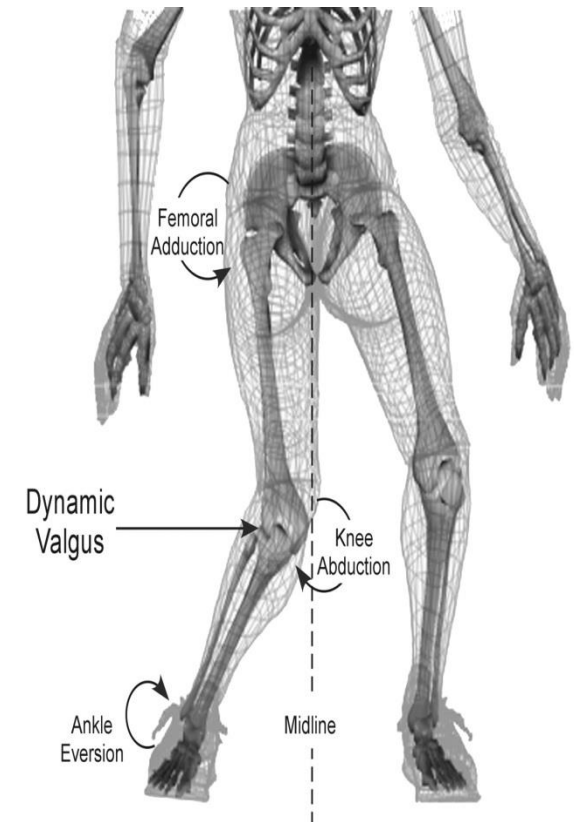
“...I Dream to Join the National Team”

- * We recommend you to have a look at the Anatomy and Pharmacology lectures related.
- * **Red** is for important things.
- * The videos may contain music.



Case scenario:

- Ahmed was playing soccer in the semi final yesterday. Before the end of the match, he was attacked to two opponents. One of them fell across Ahmed's weight bearing left leg.
- Received first aid care.
- By the next morning, his left knee was swollen and painful.
- He took 2 tablets of **paracetamol** but the pain continued.
- Undergone Lachman's test and McMurry's test, but both were **limited value** because of the **pain and swelling**.
- Went to an Orthopedic doctor and he was examined by him.
- Ahmed suggested that he takes a Cortisol Injection, but it wasn't a very good idea.



Diagnosis:

Dr. Zawad (Orthopedic surgeon) that reviewed Ahmed's investigation, took his **medical history (No past medical history and no allergy and medication history)** and examined him.

The finding indicated that there are two main structures in the left knee that were damaged.

- Damage of the **ACL**.
- **Tear of the medial Meniscus.**

Plain X-Ray

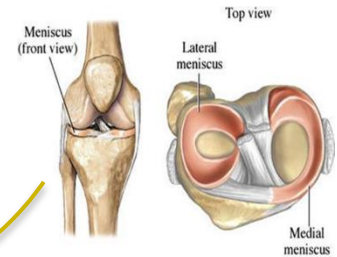
- No fracture or any other pathology noted.

MRI-scan

- The left knee is **swollen** with **evidence** of medial **meniscus** tear and damage of the **ACL**.
- **Haemarthrosis** (Blood collection in the left knee cavity)

Terms:

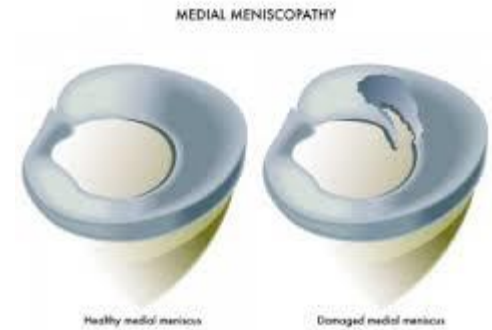
- 1-**Opponent**: a person, team, group, etc., that is competing against another in a contest.
- 2-**Sudden pop**: sudden sharp explosive sound.
- 3-**First-aid care**: The **initial** care for a patient.
- 4-**Bleeding tendency**: Abnormal susceptibility to bleeding.
- 5-**Limps on walking**: walking with difficulties. Because of damaged or stiff leg or foot.
- 6-**Palpation**: Examining by touch.
- 7-**Lachman test**: Aims at assessing the integrity of the anterior cruciate ligament.
- 8-**Tenderness**: sensitivity to pain (**when touching**)
- 9-**McMurray test**: Aims at assessing the integrity of **Menisci**
- 10-**Menisci**: a curved, fibrous cartilage in the knees and other joints.
- 11-**Medial meniscus**: its in the knee, is a thickened crescent-shaped cartilage pad between the two joints formed by the femur and tibia.
- 12-**Cortisol injection**: IV injection of Cortisol (Steroid hormone produced by the adrenal cortex)
- 13-**Anterior cruciate ligament (ACL)**: is a cruciate ligament which is one of the four major ligaments of the human knee.
- 14-**Hemarthrosis**: Accumulation of blood in a joint or joint cavity.
- 15-**Weight-bearing left leg**: Putting weight on your affected (weaker) leg.
- 16- **Bruises**: a discoloration and tenderness of the skin or mucous membranes due to the leakage of blood from an injured blood vessel into the tissues.
- 17-**Fracture**: is the separation of an object or material into two or more pieces, under the action of stress.



Tear of the Meniscus

✓ Symptoms:

- Swollen and painful knee.
- Couldn't continue playing.
- Felt a pop.
- Felt that something was taken out of place on his knee joint.
- Increasing pain.
- Limping.
- Limited range of movement.
- Tenderness. (Discovered by doing **Palpation**)



✓ Risk factors:

- Falling over the weight-bearing leg.
- Bad movement of the leg while playing sports.
- **Paracetamol** didn't have an effect on him.

Videos Corner

[Lachman Test](#)
[McMurry's Test](#)
[Arthroscopy Surgery](#)

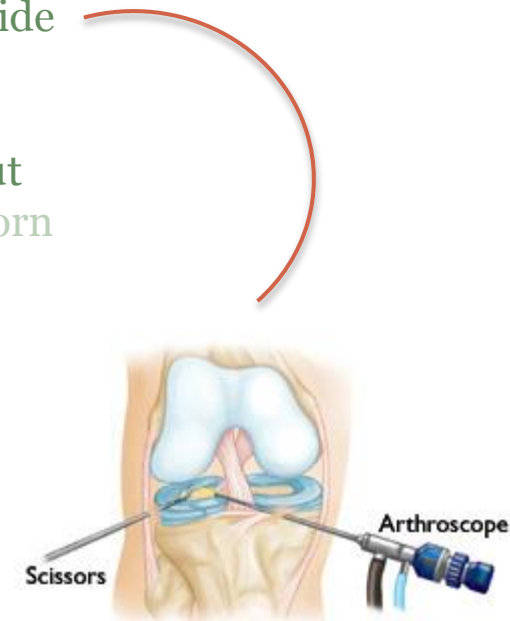
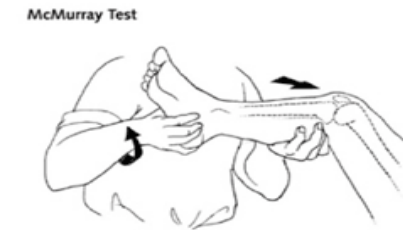
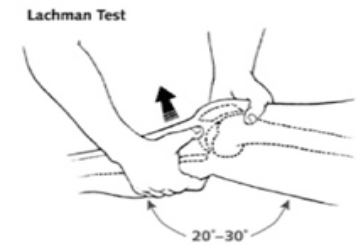
✓ Management:

- First-aid personal applied **ice** and placed a bandage (Has helped and made him walk)
- **Lachman Test** (aims at assessing the integrity of the anterior cruciate ligament.)
- **McMurray's Test** (helps in assessing the integrity of menisci)
- Undergone **Arthroscopic Surgery** > by which the surgeon can look inside the knee through a small tube; to fix any damage and reconstruct the knee.

In his case: While he was under general anesthesia, the Doctor washed out the joint from the debris, and preformed meniscectomy (removal of the torn Menisci), and finally reconstructed the knee.

In brief: Washed out the tear in **Meniscus**

- Limited motion knee brace for 2 weeks.
- **Physiotherapy** (reduce swelling)
- **Rehab** (store strength of the quadriceps and hamstring muscles.)
- He'll be returned to full activity within 2 to 4 weeks.



NSAIDs:



Are a class of drugs that reduce inflammation but are different from steroids, another class of drugs that also reduces inflammation. NSAIDs reduce pain, fever, and swelling and are commonly **prescribed for the inflammation of the joints (arthritis)**.

Cyclo-oxygenase (COX):

Is an enzyme that is responsible for the formation of prostanoids (prostaglandins, prostacyclins, and **thromboxanes**) each are involved in the inflammatory response.

The difference between COX1 and COX2:

Cyclo-oxygenase 1:

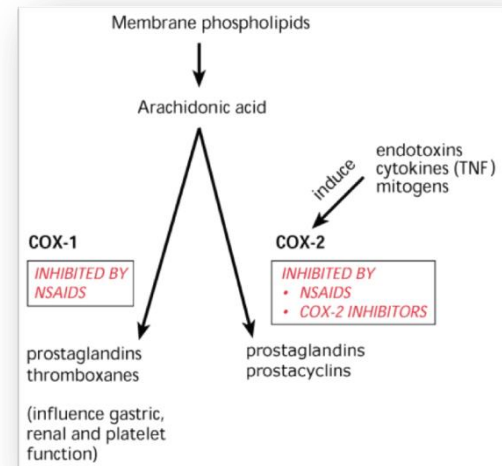
-Constitutively expressed in the GIT(gastrointestinal tract).

-**Inhibition** of COX-1 can lead to NSAID toxicity and associated side effects (ulcers, **prolonged bleeding time**, kidney problems).

Cyclo-oxygenase 2:

-Involved in the synthesis of prostaglandins that causes **pain and inflammation in the body**.

-The **inhibition** of COX-2 by traditional NSAIDs accounts for the anti-inflammatory effect of the drugs.



Taken from the Pharmacology lecture related. Have a look at it!

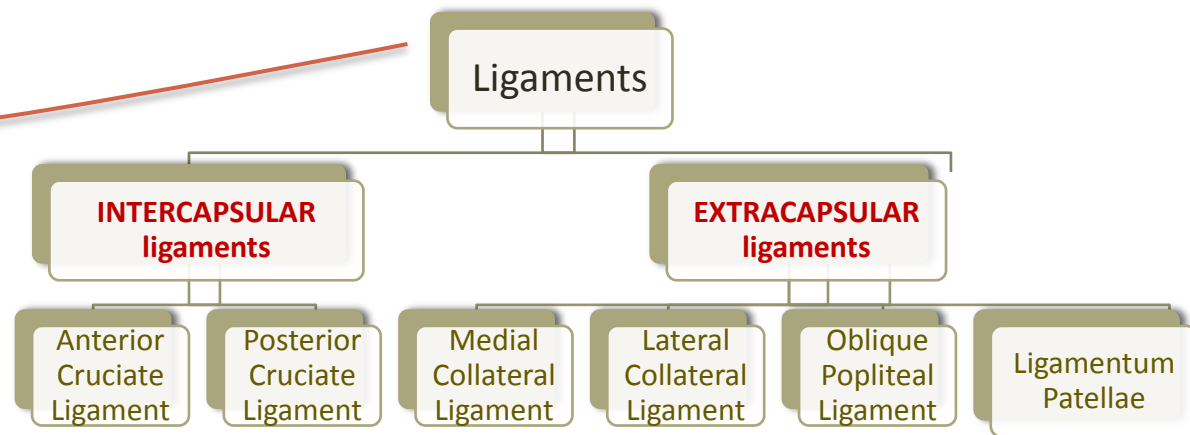
Questions



Q1: What are the structures forming the knee joint and their functions?

1/ Femur, Tibia and Patella.

2/ ligaments:



3/ Muscles:

- **Flexion:** The biceps femoris, semitendinosus and semimembranosus muscles.
- **Extension:** The quadriceps femoris
- **Medial rotation:** The sartorius, gracilis and semitendinosus.
- **Lateral rotation:** The biceps femoris.

3/ Nerve supply:

The femoral, obturator, common peroneal and tibial nerve supply the knee joint.

Q2: Which of these structures was the source of pain in the case?

- **The Anterior Cruciate Ligament (ACL)**
- ACL injury: Is the over-stretching or tearing of the anterior cruciate ligament (ACL) in the knee. A tear may be partial or complete.
- Early symptoms:
- A "**popping**" sound at the time of injury
- [Knee swelling within 6 hours of injury](#)
- Pain, especially when you try to put weight on the injured leg

Q3: What are the main differences between cox-1 and cox-2?

COX-1	COX-2
Maintains the normal lining of the stomach	Primarily present at sites of inflammation
The enzyme is also involved in kidney and platelet function.	
The inhibition of COX-1 can lead to NSAID toxicity and associated side effects (ulcers, prolonged bleeding time, kidney problems) .	The inhibition of COX-2 by traditional NSAIDs (Ibuprofen & naproxen) accounts for the anti-inflammatory effect of the drugs

Q4: What is the role of intra-articular cortisol injections in managing joint problems?

They may help in relieve pain and inflammation in a specific area of your body by the local anesthetic part of the injection.

- Cortisol is a hormone produced by your body, normally released by the adrenal gland when you are stressed, but the effects are short lived. Cortisone injections are a close derivative of that natural product, but are enhanced to produce a longer term effect.

Q5: What are the anatomical structures responsible for the stability of the knee joint?

1. Tone of the surrounding muscles.
2. Strength of the ligaments.
3. The shape of articular surfaces.

Q6: What's the role of long-term rehabilitation programs in managing conditions such as knee injuries?

The major goals of rehabilitation following ACL surgery are:

- restoration of joint anatomy
- provision of static and dynamic stability
- maintenance of the aerobic conditioning and psychological well being
- early return to work and sport.

Best of luck!



Done by:
The PBL team

Contact info:
PBLearning434@gmail.com