

CASE FIVE

Short case number: 3_19_5

Category: Musculoskeletal System & Skin

Discipline: Orthopaedics

Setting: Emergency Department

Topic: Knee injuries

Case

Gordon Slattery is a 25 year old rugby player presents with a painful right knee, he is able to weight bear but is troubled by pain.

He recalls twisting his knee while falling to the ground following a tackle. His knee was immediately painful and has been unable to walk without pain. Next day his knee pain was a bit worse and the knee a little swollen.

Questions

1. What are they key features of history that suggest an injury to the meniscus?
2. What are the key components of the examination of the knee?
3. Describe the examination findings that demonstrate an injury to the meniscus.
4. You explain to Gordon that he has most likely suffered a meniscal tear, he asks you what the meniscus is and what it does, in your explanation to Gordon, revise the anatomy, structure and function of the knee joint.
5. Summarise the different patterns of meniscal tear and explain why a medial meniscus injury is more common than a lateral meniscus injury.
6. Outline the investigations that you would organise in your assessment of Gordon's knee injury and explain the findings that would support a diagnosis of meniscal tear.
7. Gordon is concerned that he will be unable to play rugby for the remainder of the season. Outline the management plan for a medial meniscus tear and explain the post operative plan and expected recovery time.

Suggested reading:

- Solomon L, Warwick DJ, Nayagam S. Apley's Concise System of Orthopaedics and Fractures. 3rd edition. Danvers: CRC Press; 2005.

ANSWERS

Question 1

What are they key features of history that suggest an injury to the meniscus?

Athletes usually (but not always) tear their meniscus with a specific injury. In older people it can the tear can occur with minimal or no trauma.

Some people feel a pop in the knee. The injury is not usually severe and most people can continue with sports or at least can walk around without too much pain.

- Swelling usually begins the next day and is usually not severe.
- Pain is usually localised to the side of the knee where the tear is located.
- Locking of the knee is when the knee gets stuck so you can't move it (Usually it can't be straightened because a fragment of the meniscus gets stuck in between the bones).
- Giving way (usually caused by pain rather than true instability).
- Clicking.

Question2

What are the key components of the examination of the knee?

Examination of the Knee Joint

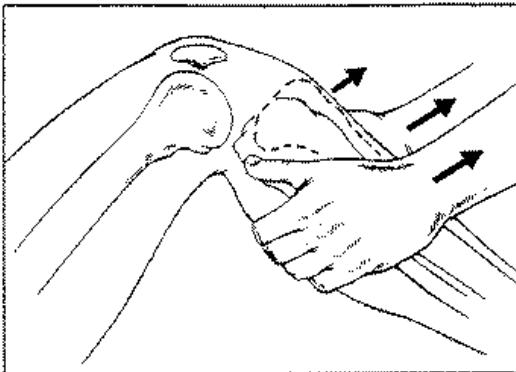
EXPOSE, LOOK, FEEL, MOVE, MEASURE, FUNCTIONAL TESTS (e.g. assess Gait - walks with knee flexed)

e.g. varum/valgum/recurvatum, Baker's cyst

1. Cruciate Ligaments

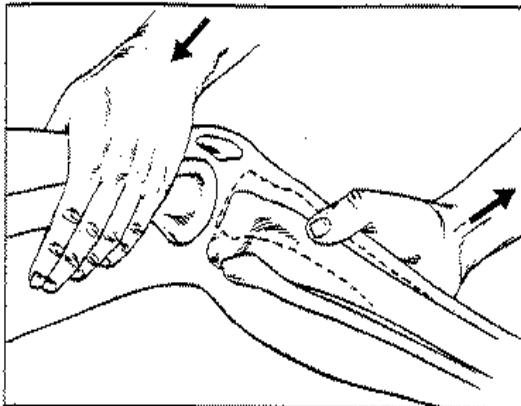
- a) Anterior drawer sign
 - b) Posterior drawer sign
 - c) Lachman test
- a) and b) Anterior & Posterior Drawer Sign

- knee at 90 degrees flexion
- patient's foot kept stable
- hamstrings need to be relaxed
- tibia drawn anteriorly to test ACL
- pushed posteriorly for PCL
- assess extent of movement and quality of end point
- Greater than or equal to 0.5cm displacement = Ruptured ACL



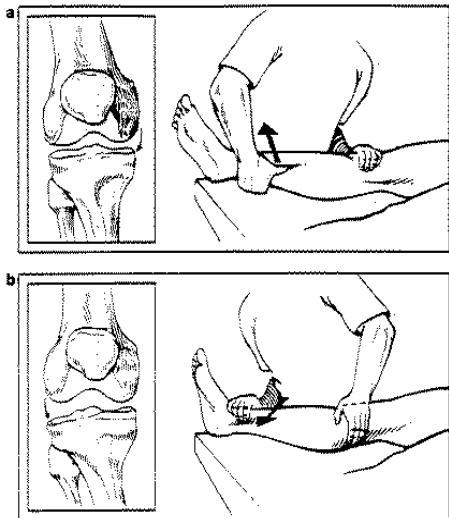
c) Lachman Test

- follows ACL and PCL test
- flex knee to 30°, grasp proximal tibia and support distal femur
- tibia then pulled anteriorly
- when uninjured the ligament should have a crisp end point as it stops forward progression of the tibia
- complete rupture of the ligament results in a notable (>4mm) increase in translation & an absence of a firm end point
- if there is an increase in translation and an end point, then a partial rupture of the ACL or an injury to the PCL should be considered



2. Collateral Ligaments

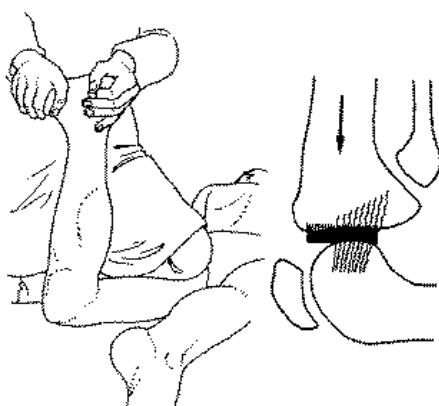
- knee fully extended and at 30 degrees of flexion to relax posterior knee capsule
- Extended +ve = MCL & cruciate damage
- Flexed +ve = MCL damage only
- apply a varus (LCL) and a valgus (MCL) force
- do not allow the femur to rotate
- assess for pain, extent of movement and a feel for an end point
- M. spasm can mask a low-grade tear
- Best if tested shortly after injury



1. McMurray's Test

McMurray's Test

- tests for tears in the posterior half of the meniscus (tests posterior as well)
- Patient supine
- hip and knee flexed
- at various stages of moving the hip and knee from flexion to extension, internal and external rotation of the tibia on the femur is performed
- can add varus and valgus stress
- pain and a palpable 'clunk' is a positive McMurray's test
- if no 'clunk' but pain is present, the meniscus may be damaged or have patellofemoral joint pathology



Question 3

Describe the examination findings that demonstrate an injury to the meniscus.

The patient is usually a young person who sustains a twisting injury to the knee on the sports field. Pain is often severe and further activity is avoided. Occasionally the knee is locked in partial flexion. Almost invariably, swelling appears some hours later or perhaps the following day. On examination the joint might be slightly flexed and there is often an effusion. In late presentations, the quadriceps will be wasted. Tenderness is localized to the joint line, in the vast majority of cases on the medial side. Flexion is usual full but extension is often slightly limited.

Question 4

You explain to Gordon that he has most likely suffered a meniscal tear, he asks you what the meniscus is and what it does, in your explanation to Gordon, revise the anatomy, structure and function of the knee joint.

The meniscus is a soft rubbery structure between the femur and tibia. There is one on each side of the knee, a medial and a lateral meniscus. A Meniscal tear is very common.

The function of the meniscus is to act as a.

- Shock absorber.
- Stabiliser.
- And to help with lubrication.

A knee which does not have a meniscus has a significantly higher chance of developing osteoarthritis in the long term. The severity and timing of this arthritis depends on many factors including your age, activity levels, weight and degree of meniscal damage.

Question 5

Summarise the different patterns of meniscal tear and explain why a medial meniscus injury is more common than a lateral meniscus injury.

The medical meniscus is affected far more frequently than the lateral, partly because its attachments to the capsule make it less mobile.

Different patterns of tears are recognised.

Bucket handle tears: – when the split is vertical but runs along part of the circumference of the meniscus, creating a loose sliver still attached anteriorly and posteriorly. The torn sliver sometimes displaces towards the centre of the joint and becomes jammed between femur and tibia, causing a block to extension ('locking').

Horizontal tears: Usually are degenerative or due to repetitive minor trauma.

Question 6

Outline the investigations that you would organise in your assessment of Gordon's knee injury and explain the findings that would support a diagnosis of meniscal tear

Diagnosis can usually be made based on the history and examination alone. An MRI test is usually ordered to confirm the diagnosis and to exclude other pathology but this is usually not needed and may delay treatment.

Question 7

Gordon is concerned that he will unable to play rugby for the remainder of the season. Outline the management plan for a medial meniscus tear and explain the post operative plan and expected recovery time.

Initial treatment involves Rest, Ice, Elevation and bandaging. There is no urgency to be seen by a surgeon unless you have a locked knee (The meniscus can be damaged when it gets caught between the bones of the knee joint).

The meniscus rarely heals itself (due to its poor blood supply) and treatment for a meniscal tear usually involves an arthroscopy. The torn meniscus can be trimmed or repaired. The decision to repair is based on age, activity levels, occupation and sporting demands. The final decision cannot be made until the time of surgery as it depends on the size, site and the quality of the remaining meniscus.

Because the meniscus has a poor blood supply it has a limited potential to heal. Only tears in the outer half of the meniscus have the potential to heal. The decision to attempt a repair is based on age, activity levels, occupation and sporting demands.

Most patients with a repairable meniscus are under 45 years of age and up to 80 percent of these are associated with a tear of the anterior cruciate ligament. An MRI scan helps determine the extent of the tear but the final decision to repair cannot be made until the time of surgery as it depends on the size, site and the quality of the remaining meniscus. There is no point in repairing a meniscus which is unlikely to heal.

The post-op instructions will vary from one knee to another depending on the extent of the repair and damage to other structures. Usually the surgery is done as a day only procedure. You may require crutches and a splint. Your weight bearing and bending may be restricted again depending on the extent of the repair. Time required off work varies from a few days to a few months depending on your occupation. Sporting activities can resume at 3-6 months.

If your meniscus does not heal, you may develop ongoing symptoms and require further arthroscopic surgery to remove the torn portion of the meniscus which has not healed.