

Meniscus injury management

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Learning objectives

- Recognise the signs of meniscus injuries.
- Differentiate meniscus injuries from anterior cruciate ligament (ACL) tears, medial collateral ligament (MCL) injuries and other common knee problems based on clinical presentation and history.
- Conduct a systematic knee examination to assess swelling, tenderness and range of motion, and use appropriate special tests like the McMurray test to confirm meniscus injuries.
- Understand the role of x-rays and magnetic resonance imaging (MRI) scans in diagnosing meniscus injuries and ruling out fractures or other bony involvement.
- Determine suitable management strategies such as rest, physiotherapy and surgical options based on factors like injury severity, patient age and desired activity level.

Case presentation

A 24-year-old female patient presents with acute swelling on her left knee. The injury occurred during a soccer match when she twisted her knee while changing direction. The patient reports a popping sensation at the time of injury; she could still play on, but noticed a knee swelling that evening. There is no history of previous knee injuries or medical problems. On examination, the knee appears swollen and tender, with limited range of motion. There is no neurovascular deficit noted.



Figure 1: Clinical photograph depicting the swelling on the medial aspect of the left knee. The overlying skin shows no significant changes.

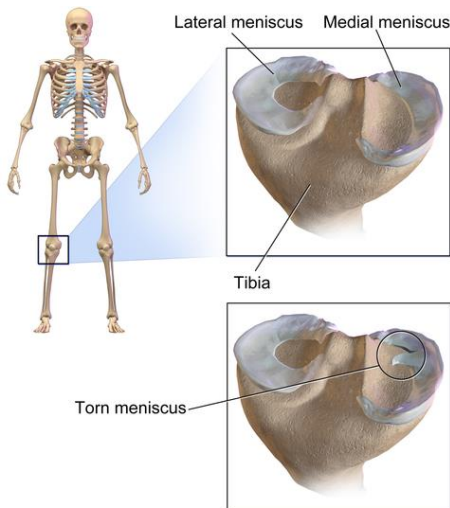


Figure 2: Image showing intact and torn menisci (Source: [BruceBlaus](#), CC BY-SA)

History

The patient's history often strongly indicates the diagnosis of meniscus tears.

Injury mechanism: Usually this is a twisting injury with moderate, delayed swelling. The meniscus has limited perfusion and does not generate a large immediate haematoma as in ACL injuries.

Aggravating factors: Meniscus tears generate symptoms especially in flexion and when loading the knee.

Location and associated symptoms: Meniscus tears are often associated with clicking or locking and are most commonly painful around the joint line.

Examination

A systematic examination of the knee is essential, including:

- **Look:** Identify the location and amount of swelling in the form of an effusion.
- **Feel:** Palpate for tenderness, especially in the joint line. Feel for an effusion with the tap or wipe test. Please see the chapter on knee examination for this.

- **Move:** The end range (extreme flexion or extension) is most commonly painful in meniscus tears.

Special tests

Ligament tests: Rule out ligament laxity which can be associated with meniscus tears.

Meniscus tests: There are special tests for meniscus injuries, which usually include flexion of the knee as well as internal/external rotation of the tibia and varus/valgus force. Special tests include the McMurray, Steinman and Thessaly tests. These are unnecessary if there is joint line tenderness (the most sensitive test for meniscus injuries) and knee effusion.

Special investigations

Plain x-rays

Plain x-rays should be done to rule out fractures or any underlying bony pathologies.

MRI scan

An MRI scan is essential for identifying meniscus injuries and their severity as well as associated cartilage or ligament injuries.



Figure 3: Weight-bearing x-ray showing no fractures or bony involvement

Differential diagnoses

When evaluating sport knee injuries, it is essential to consider a range of possible differential diagnoses to ensure an accurate diagnosis and appropriate management. Here are some common differential diagnoses to meniscus tears:

ACL injury: ACL tears are common in sport involving sudden stops, changes in direction or direct blows to the knee. Patients may experience significant pain, swelling and instability.

MCL injury: MCL injuries should be ruled out, especially with medial joint pain. The maximum pain point is usually over the MCL insertion on the epicondyle down the proximal tibia. These injuries often result from direct blows to the outer knee, causing pain, localised swelling and tenderness along the inner knee. They often occur in contact sport.

Patellar tendinitis (jumper's knee): Overuse of the patellar tendon is common in sport involving repetitive jumping, which can lead to tenderness and pain below the kneecap.

Iliotibial (IT) band syndrome: Overuse or friction of the IT band, a thick band of tissue running along the outer thigh, can cause pain and inflammation on the outer side of the knee which can often present with a similar location of pain as lateral meniscus tears. However, the pain does not increase with flexion in IT band syndromes.

Lateral collateral ligament (LCL) injury: LCL injuries result from direct blows to the inner knee, leading to pain, swelling and tenderness along the outer knee, most commonly on its insertion over the epicondyle or fibula head.

Patellar dislocation/subluxation:

The patella (kneecap) may partially dislocate or completely dislocate due to trauma or underlying structural issues, causing severe pain and instability. These dislocations cause immediate swelling due to haemarthrosis.

Plica syndrome: The irritation of the synovial plica within the knee joint can lead to pain and clicking sensations during movement. An MRI can best differentiate this pathology.

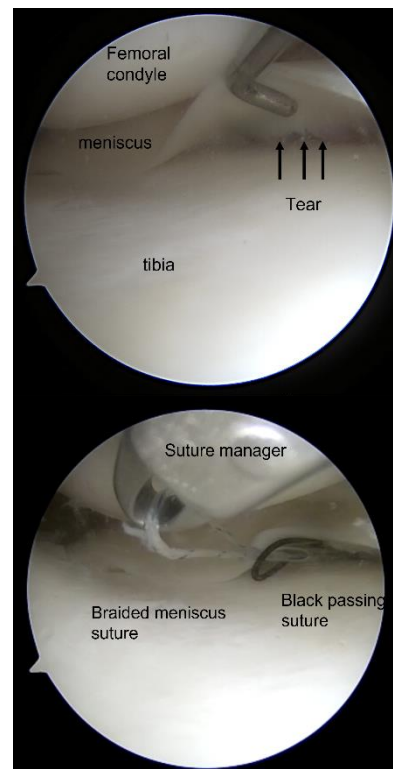


Figure 4: Under-surface tear of the medial meniscus (top) sutured with an outside-in technique passing a braided suture to repair the tear (bottom)



Figure 5: Bucket handle meniscus tear (top) and meniscus sutures (bottom)

Long-term management: Monitor patient progress and address any complications, ensuring a gradual return to sport activities when appropriate.

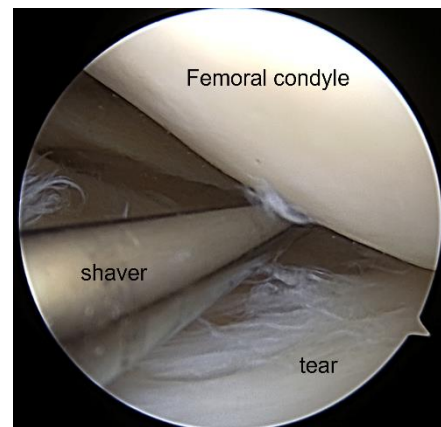


Figure 6: Degenerative meniscus tear, not repairable

Management plan

Diagnosis: Confirm meniscus tear through clinical examination and MRI scan.

Initial care: Administer protection, rest, ice, compression and elevation (PRICE) for pain and swelling management.

Conservative approach: For minor tears without mechanical symptoms, prescribe rest, physiotherapy and gradual return to activities.

Surgical evaluation: Refer to an orthopaedic specialist for thorough evaluation of MRI findings and the patient's functional needs.

Surgical consideration: Consider arthroscopic meniscus repair for active individuals with significant tears, aiming to restore function and prevent further damage.

Post-surgery rehabilitation: Emphasise structured rehabilitation for optimal recovery, focusing on range of motion, strength and functional activities.

Key takeaways

- Meniscus injuries often result from twisting injuries in the knee and may present with delayed swelling as well as pain during flexion and loading.
- Clinical examination, including joint line tenderness and special tests like McMurray and Thessaly, helps diagnose meniscus tears.
- MRI scans play a crucial role in identifying meniscus injuries and assessing their severity, along with associated ligament and cartilage injuries.
- Treatment varies based on the tear's extent; conservative approaches involve rest, physiotherapy and gradual return to activity.
- In selected cases, surgical options like arthroscopic meniscus repair may be considered to restore function and prevent further damage.

Assessment

1. A 24-year-old female patient presents with acute swelling on her left knee following a twisting injury during a soccer match. She reports a popping sensation at the time of injury and noticed knee swelling that evening. On examination, her knee is swollen and tender, with limited range of motion. There is no neurovascular deficit. Which of the following is the most appropriate next step in her management?

- A. Immediate surgical intervention
- B. Application of PRICE
- C. Administration of corticosteroid injections
- D. Prescribing nonsteroidal anti-inflammatory drugs (NSAIDs) and advising rest

The answer is (B). The application of PRICE is the most appropriate initial management for a suspected meniscus injury to reduce pain and swelling while awaiting further evaluation, such as an MRI scan, to confirm the diagnosis.

2. A 28-year-old athlete complains of lateral knee joint line pain that worsens with activities such as squatting and climbing stairs. Physical examination reveals no ligamentous laxity but some effusion. X-rays show no specific abnormalities. What is the most likely diagnosis?

- A. Meniscal tear
- B. Patellar tendinitis
- C. Patellofemoral pain syndrome
- D. Osteochondral fracture

The answer is (A). Lateral knee joint line pain that worsens with activities like squatting and climbing stairs, along with some effusion, is suggestive of a meniscal tear. Meniscal tears can cause pain and discomfort, especially when the torn fragment becomes caught between the joint surfaces during movement. The absence of ligamentous laxity and clicking, along with the location of pain and the aggravating activities, are indicative of a meniscal injury.

3. A 16-year-old basketball player presents with knee pain and a "clicking" sensation during knee movements. MRI shows a meniscal tear and the patient is otherwise healthy. What is the most appropriate initial treatment for this patient?

- A. Arthroscopic meniscal repair
- B. Non-weight bearing and analgesics
- C. Physiotherapy and quadriceps strengthening exercises
- D. Immediate surgical intervention

The answer is (C). In cases of a meniscal tear without significant mechanical symptoms or joint locking, conservative management with physiotherapy and quadriceps strengthening exercises is often the initial approach. Surgery may be considered if symptoms persist or worsen despite conservative management.

4. A 30-year-old marathon runner experiences acute swelling and limited range of motion in the left knee after a sudden twist during training. X-rays show no bony abnormalities, and MRI confirms a meniscus tear. The patient desires to return to running as soon as possible. What is the most appropriate management plan for this patient?

- A. Immediate surgical ACL reconstruction
- B. Conservative management with rest and bracing
- C. Arthroscopic meniscus repair
- D. Non-weight bearing and physiotherapy

The answer is (C). For active individuals who engage in high-demand sport such as running, meniscus repair will allow return to activity in 80% of patients and prevent early arthritis.

5. A 55-year-old recreational soccer player reports a recent injury to the knee, with localised tenderness and mild swelling. Physical examination reveals a stable joint, no clicking or locking, and no ligamentous laxity. MRI shows a horizontal meniscus tear. What is the most appropriate management approach for this patient?

- A. Surgical intervention with meniscus repair
- B. Conservative management with rest and physiotherapy
- C. Immediate return to sport activities
- D. Regular injections with cortisone

The answer is (B). Conservative management with rest, physiotherapy and gradual return to activities is the best management for older patients with chronic meniscus pathology (horizontal meniscus tears) without clicking or locking sensations.

References and further reading

OpenAI. (2023). ChatGPT (Mar 14 version) [Large Language model]. Available from: <https://chat.openai.com/chat>

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ABOUT THE BOOK

This is the second edition of the *Orthopaedics for Primary Health Care* textbook edited by Michael Held, first published in 2021.

Most patients with orthopaedic pathology in low- and middle-income countries are tested by non-specialists. This book was based on a Delphi consensus study* with experts from Africa, Europe and North America to identify topics, skills and cases concerning orthopaedic trauma and infection that need to be prioritised in order to provide guidance to these health care workers.

The aim of this book is to be student-centred.

*Held et al. Topics, Skills, and Cases for an Undergraduate Musculoskeletal Curriculum in Southern Africa: A Consensus from Local and International Experts. *JBJS*. 2020 Feb 5;102(3):eLO.



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This chapter was authored as part of a supervised student co-authorship initiative, in which students made use of ChatGPT as an aid in the authorship process.

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