

Knee Pain

Covering the Angles

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Lou's case

Lou, 60, enjoys tennis and golf. He presents with progressive medial knee pain. He had a meniscectomy 30 years ago.

Physical exam reveals:

- no effusion,
- a mild varus deformity,
- medial joint line tenderness, and
- range of motion from 5 to 130 degrees.



Joint space narrowing on X-rays can best be maximized with 20 degrees of flexion when taking the anteroposterior standing view. A lateral view and, occasionally, a skyline view are also necessary if there is patellofemoral arthritis.

In this situation, moderate joint space narrowing is observed with some osteophyte formation and subchondral sclerosis.

For a followup on Lou, go to page 89.

The enthusiasm for diagnostic imaging, particularly in musculoskeletal medicine, has seen an epidemic number of magnetic resonance imaging (MRI) and ultrasounds being performed. While imaging studies are appropriate and valuable in certain circumstances, they are, in many cases, unnecessary for diagnosis and treatment of musculoskeletal disorders of the knee. Clinical evaluation and re-evaluation are essential for the diagnosis and management of knee disorders.

1. The torn meniscus

The meniscus of the knee is a specialized shock absorber that can be torn with wear and tear or acute injuries. The central two-thirds of the meniscus has no blood supply; this is where the majority of tears occur. Once torn, there is no potential for healing because of its avascular nature.

► What are the symptoms?

Once torn, the meniscus causes:

- an inflammatory reaction with swelling,
- localized tenderness,
- pain with deep knee flexion and twisting activities, and
- possible mechanical symptoms.

Locking, the inability to extend the knee from a semi-flexed position, may also occur. In such cases, one must do some form of maneuver to dislodge the torn piece back into its normal position so the knee can fully extend.

Through time and activity, the torn piece will either tear further and become free-floating or just grind itself down. As this takes place, the articular surface can occasionally get damaged and the patient may be predisposed to osteoarthritis in the future.

► *How is it diagnosed?*

The diagnosis of a torn meniscus is done through history and physical exams and is rarely aided by imaging. MRIs can be done, but are not often required for diagnosis.

► *How is it treated?*

Treatment is based on symptomatology and how the injury interferes with the patient's life. Individuals who are more aggressive with physical activity and have more mechanical symptoms have increased likelihood of requiring and wanting meniscectomy, particularly if they fail to improve over a period of several weeks. The more symptomatic the individuals, the more likely they will want surgical arthroscopic excision.

Meniscal tears with associated anterior cruciate ligament injury are repairable and heal well; approximately 80% to 90% of them will heal. The lateral meniscus has a greater potential to heal than the medial meniscus, most likely due to the fact that it is less loaded and that the lateral meniscus has greater mobility and less stress on the healing area.

Once patients have a meniscal tear, it is important to instruct them that contact stresses on the articular surface are substantially increased, as is their long-term prognosis for degenerative arthritis of that compartment.

Avoidance of repetitive impact activities should be reinforced. Patients should be made aware of the concept of knee miles; explain that joints have limited mileage

A followup on Lou

The patient has to be aware there is a limited number of knee miles and the more he uses the knee, the more it will wear over time. Non-impact activities are recommended.

Other options are:

- **Weight loss:** It has been shown that weight loss is extremely important and will increase the effectiveness of other therapies.
- **Exercise:** Muscle strengthening and range of motion exercises will reduce pain and improve function.
- **Orthotics:** Shock-absorbing shoe wear and socks will decrease pain from activity and orthotics may also offer relief in the malaligned knee or foot.
- **Brace:** A knee brace is often valuable. Custom Unloader™ braces are expensive and only slightly more effective.
- **Drugs:** Acetaminophen with rescue anti-inflammatory is effective with few side-effects; glucosamine sulphate, 500 mg three times daily to a maximum of 3 g per day, is often effective and worthwhile.
- **Injections:** Viscosupplementation with hyaluronic acid is done with three injections one week apart; there is a 75% positive response rate, with a local reaction of 3%.

Surgical involvement would be for patients who have more mechanical symptoms in the setting of arthritis with swelling and acute deterioration. Cartilage resurfacing procedures in this situation are not indicated.

Osteotomy procedures may be indicated and later, joint replacements; unilateral or total knee replacement would be the final surgical solution.

Lynn's case

While playing soccer, Lynn, 18, runs down the field, decelerates, changes directions, and feels a sudden pop in her knee, along with a sensation of giving way.



She has immediate pain and swelling of her knee for the next two to three hours, as well as difficulty weight bearing. She is unable to continue playing soccer.

Lynn has sustained an acute anterior cruciate ligament injury.

Table 1

When to get an X-ray

The Ottawa Knee Rules are a useful guide for knowing when to order an X-ray in acute knee injuries.

Under this guide, X-ray should be performed:

- in patients age 55 or older;
- if there is tenderness in the fibular head;
- if there is patellar tenderness;
- if the patient is unable to flex to 90 degrees; and/or
- if the patients is unable to weight bear (4 steps).

Magnetic resonance imaging for the acute knee is often unnecessary. It is occasionally useful to document the extent of the injury, but this does not guide treatment. Patients' age, severity of injury, and sports they perform dictate the course of treatment.

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and, although exercise is very beneficial to the cardiorespiratory system, bones, and muscles, it isn't necessarily beneficial to the articular cartilage on a long-term basis.

2. Acute knee injury

Acute knee injuries are becoming epidemic, particularly in young women playing sports with significant cutting activity.

► What are the symptoms?

Seventy per cent of acute knee injuries occur without contact (*i.e.*, the person changes directions, decelerates simultaneously, and the anterior cruciate ligament fails). Approximately 40% of patients will feel a pop and then have a sensation of the knee giving way; these are very valuable symptoms to enquire about. Also, 90% of patients will have an acute swelling of their knee, suggesting a hemarthrosis.

► How is it diagnosed?

Exam usually reveals a swollen knee held in a flexed position. Limited motion is common and generalized tenderness is non-specific within the first two weeks. Motion and tenderness should be documented for comparison reasons. X-rays can be done to assist in the diagnosis (Table 1).

One must rule out a patellar dislocation, as it can mimic an anterior cruciate ligament tear.

► What should be looked for on exam?

If the patella is dislocated laterally, one must feel for any tenderness in the medial aspect, where the fibres are torn. The knee is examined specifically for ligamentous instability, both at extension and at 20 degrees of flexion.

If patients are unstable in full extension, they have torn at least two ligaments and require immediate referral to an orthopedic surgeon. If the knee opens slightly in 20 degrees of flexion, this indicates a collateral ligament injury.

The cruciates

Examining the cruciates is more difficult; it requires knee flexion, which is often difficult to perform early on. Therefore, a cruciate injury diagnosis is very difficult to obtain and history is often more indicative than clinical findings.

Table 2 lists the tests used to diagnose anterior cruciate injury. Posterior cruciate injuries are subtle and can be difficult to distinguish from anterior cruciate ligament injuries. Look at the lateral profile of the knee at 90 degrees of flexion, focusing on the position of the fibular tubercle (sag sign).

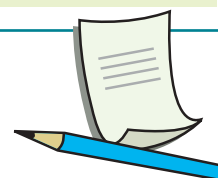
In the acute knee, the patient is in quite a bit of pain and ligament maneuvers must be done carefully. If you are unsure and worried about a significant ligament injury, referral is the best option. **Dx**

Table 2

Tests for anterior cruciate

1. **Lachman Sign:** Essentially an anterior drawer test with the knee in 20 degrees of flexion.
2. **Anterior Drawer:** Drawer is at 90 degrees of flexion
3. **Pivot Shift:** A more complex maneuver to perform, particularly in acute knee injury

Take-home message



1. Torn meniscus

- **Symptoms:** Inflammation, localized tenderness, possible mechanical symptoms
- **Diagnosis:** Thorough history and physical exams
- **Treatment:** Based on symptoms and patient's lifestyle

2. Acute knee injury

- **Symptoms:** Pop sound and a sensation of knee giving way; some acute swelling
- **Diagnosis:** Examine tenderness, motion, and stability (X-rays, as indicated by Ottawa Knee Rules)
- **Treatment:** Ice, early range of motion and isometrics, weight bearing, and possible bracing; repeat exam; significant injuries require early referral

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