

Knee Pain

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Diagnosis of Meniscal Tears Part 2 – Clinical Assessment

I recently wrote to you about the merits of MRI versus history & physical examination in the diagnosis of meniscal tears. This newsletter describes important aspect of the clinical examination.

Suspicion of a meniscal tear will result from a combination of examination and elements from the history of injury. The information below may help in providing a better understanding of the factors which may lead to meniscal tears.

Acute Injury

The pain associated with acute meniscal tears can be quite variable. There can be severe pain, immediate disability, and sometimes associated locking. Alternatively, pain and swelling may only occur the day after the injury. Small tears, particularly degenerative ones, may be asymptomatic. Twisting is a common predisposing cause, & this can be a slow or fast motion event. There may or may not be a feeling of tearing at the time of injury.

Effusion is not always present with a meniscal tear. This is more likely with chondral rather than meniscal cartilage injury, unless the torn meniscus irritates the synovium or articular surface.

The medial meniscus is closely attached to the medial joint capsule. It is therefore less mobile than the lateral meniscus, and more prone to injury.

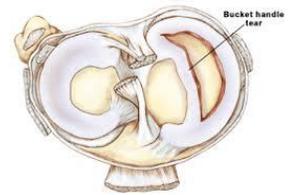
The main types of meniscal tear are described below:

Bucket handle tear: This results from a longitudinal meniscal tear. It is often preceded by a twisting injury, often with varus or valgus



Longitudinal tear

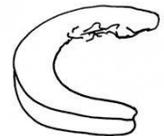
stress, and with the foot planted. There will often be locking with an acute tear, and slow onset of effusion. There will be pain on attempted knee extension, &



same side joint-line tenderness. There may be clicking, and the knee can spontaneously lock or unlock. There may be a positive McMurray's test. A bucket-handle tear of the medial meniscus is caused by a knee abduction force, drawing the meniscus into the joint. As the force is released, the meniscus is caught between tibial & femoral condyles. A lateral bucket handle tear may be due to an adduction force. A 'tag tear' represents a fractured bucket handle tear.

Degenerative tear

Degenerative tears can occur seemingly without any precipitating event, and can be asymptomatic. They are common in older people, and those who spend prolonged periods of time kneeling or crouching. Twisting on rising from a squat makes the posterior horn particularly vulnerable. If a person develops pain after such episodes, particularly if there is moderate swelling & joint-line tenderness, a degenerative posterior horn tear should be suspected, more commonly on the medial side. Occasionally these injuries occur in younger patients who engage in prolonged squatting (eg baseball catcher, tradesperson). There will be pain



and often restriction on squat, and a positive McMurray's test.

Transverse tear: This occurs in the middle one third of the lateral meniscus, which is more mobile than the medial. It is also known as a radial or 'parrot-beak' tear.

This may occur with knee abduction / valgus force, compressing and vertically tearing the meniscus. The injury may occur at the



same time and with the same mechanism as a medial collateral ligament (MCL) tear. It is more likely to occur in a degenerative lateral meniscus

Instability related tears: Ligamentous instability of the knee makes the menisci more vulnerable to injury.

Where there is chronic instability, giving way may result in a bucket handle tear. Chronic lateral pain may point to a cleavage tear of the posterior horn of the lateral meniscus. With ACL instability, acute lateral meniscal tears are common, while chronic instability is more likely to affect the medial meniscus.

Anterior horn tear: This is rare but may result from a hyperextension injury.

Physical Examination

There are two main clinical tests that we have at our disposal, to assist us in making the diagnosis of a meniscal tear. Other tests, such as the Apley's compression test, are no longer in favor.

The **McMurray's test** (over-pressure of full flexion with rotation, abduction / adduction) will reproduce pain with most meniscal tears. There may be an associated clunk, however this is common in normal knees, and is only significant if it is associated with the patient's pain or other symptoms. Flexion combined with external rotation is more indicative of medial meniscal injury, while flexion / internal rotation is indicative of lateral meniscus pain.

Joint-line palpation will frequently elicit tenderness on the side of the tear. This is performed with the knee between 45 to 90 degrees of flexion. However keep in mind that most knee injuries will have some associated tenderness present.

Differential diagnosis

Swelling within or around the knee can be due to several causes. Most often there is some degree of chondral cartilage injury, or synovial inflammation.

Acute swelling (within 2 hours of injury) is due to a haemarthrosis. This will usually be due to an ACL rupture or patellar dislocation. An osteochondral fracture unrelated to the patellofemoral joint is a less common cause.

Acute locking can occur due to the presence of a loose body (from an osteochondral injury or osteochondritis dissecans); or from synovial chondromatosis. Around 20% of loose bodies are radiolucent so will not be seen on X-ray. Pseudolocking may occur after a 1st or 2nd degree tear of the MCL, and is due to associated hamstring spasm. Pseudolocking may also be due to gross joint effusion. Less common causes are partial ACL tear & medial plica syndrome.

References:

1. Cross, M & Crichton, K (1987). Clinical Examination of the Injured Knee. Gower Medical Publishing, London.
2. Brukner, P & Khan, K (2012). Clinical Sports Medicine, 4th ed.. McGraw Hill, Sydney.

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