



QUESTION | Who were McMurray and Thessaly and are their test's useful in diagnosing and treating meniscal tears?

ANSWER | One of the most famous tests performed as part of a physical examination of the knee is called McMurray's test. There are many variations described of exactly how to do his test and what the findings actually mean. There are also various claims regarding the sensitivity and specificity of his test. More recently Thessaly's test has been proposed as being a more useful test than McMurray's when looking for meniscal pathology.

T. P. McMurray was the professor of orthopaedic surgery at Liverpool university in England. In 1940 he delivered the Robert Jones Memorial Lecture at the Royal College of Surgeons in England and this was published in the British Journal of Surgery in April 1942. The title of his lecture was "The Semilunar Cartilages".

At that time a plain x-ray was the only imaging modality available. A very careful clinical examination was therefore required to guide treatment (which was generally an open meniscectomy). McMurray believed in taking a detailed history of the injury and subsequent symptoms to try to guide his diagnosis.

"From the history, and by a careful clinical examination, it is possible to diagnose most of the semilunar cartilage lesions in which the injury has occurred anterior to the lateral ligaments. Tears or displacements posterior to this point produce so few of the classical signs and symptoms that other methods of examination are necessary for their elucidation. In this connexion the use of manipulation of the injured joint has proved itself of value."

McMurray emphasised that the severity of the lesion could not be gauged by the degree of tenderness to palpation: *"in fact, a strain may give rise to extreme localized tenderness, while a complete rupture of the cartilage at the same point may be comparatively free"*.

He also stated: *"The absence of tenderness must not be taken as a contra-indication to the diagnosis of a cartilage lesion because, although usually present after the injury, it tends to diminish, and in many cases disappear, after a few weeks, even though the underlying cartilage may be broken or displaced"*.

In the next section of the lecture McMurray described his clinical evaluation of the knee in great detail. He did not rely on a single manoeuvre to make the diagnosis of a meniscal tear but used a combination of history, palpation and manipulation to guide his diagnosis. He also differentiated where he felt the location of the tear was in the meniscus based on the history and examination.

It is well worth reading his full article (<https://doi.org/10.1002/bjs.18002911612>)

"Palpation.-By palpation alone many abnormalities may be diagnosed. The palpation must be continued during the full range of movements of the joint, as only by this means can such

conditions as slipping of one of the hamstring muscles round the femoral condyles or biceps tendon over the head of the fibula be fully appreciated.”

His description of the test that has been modified many times follows:

“In carrying out the manipulation with the patient lying flat, the knee is first fully flexed until the heel approaches the buttock; the foot is then held by grasping the heel and using the forearm as a lever. The knee being now steadied by the surgeon’s other hand, the leg is rotated on the thigh with the knee still in full flexion. During this movement the posterior section of the cartilage is rotated with the head of the tibia, and if the whole cartilage, or any fragment of the posterior section, is loose, this movement produces an appreciable snap in the joint. By external rotation of the leg the internal cartilage is tested, and by internal rotation any abnormality of the posterior part of the external cartilage can be appreciated. By altering the position of flexion of the joint the whole of the posterior segment of the cartilages can be examined from the middle to their posterior attachments. Thus, if the leg is rotated with the knee at right angles the cartilages in their mid-section come under pressure but anterior to this point, the pressure exerted on the cartilage is so diminished that accurate examination is impossible. When a loose segment is caught..... a thud or click, which can sometimes be heard but can always be felt.....”

As a summary: Probably the simplest routine is to bring the leg from its position of acute flexion to the right angle, whilst the foot is retained first in full internal and then full external rotation. Any abnormality will be discovered during the straightening of the joint”

This simple description has been modified many times over the years varying from starting in extension and ending in flexion to including joint line tenderness, with or without a clunk. It is worth noting that McMurray was not looking for tenderness or pain during this part of the examination.

He then points out that *“This method is not described as a counter to the ordinary methods of examination of the joint, but rather as a useful accessory.”*

Thessaly’s test was described in 2005 in an article published in The Journal of Bone and Joint Surgery. The study was from the Orthopaedic Department, University of Thessaly, Larissa, Hellenic Republic, Greece which explains where the name Thessaly came from. This is in the northern side of Greece between Macedonia, Sterea, Epirus and the Aegean Sea and is a region rather than a person.

They compared 213 symptomatic patients with 197 asymptomatic volunteers and described the Thessaly test at 5 and 20 degrees of knee flexion. MRI and arthroscopic findings were used in their analysis. Their findings indicated low rates of false positive and false negative tests with a very high degree of accuracy for both medial and lateral meniscal tears.

*“The Thessaly test is a dynamic reproduction of load transmission in the knee joint and is performed at 5° and 20° of flexion. The examiner supports the patient by holding his or her outstretched hands while the patient stands flatfooted on the floor. The patient then rotates his or her knee and body, internally and externally, **three times**, keeping the knee in slight flexion (5°). Then the same procedure is carried out with the knee flexed at 20°. Patients with suspected meniscal tears experience medial or lateral joint-line discomfort and may*

have a sense of locking or catching. The theory behind the test is that, with this manoeuvre, the knee with a meniscal tear is subjected to excessive loading conditions and almost certainly will have the same symptoms that the patient reported. The test is always performed first on the normal knee so that the patient may be trained, especially with regard to how to keep the knee in 5° and then in 20° of flexion and how to recognize, by comparison, a possible positive result in the symptomatic knee.”

A word of caution when performing this test though:

“When the Thessaly test was performed at 20° of flexion, seven (3.3%) of the patients ... had a clinically important exacerbation of knee symptoms, requiring the administration of analgesic tablets, and one patient had the knee lock, requiring manipulation with the patient under anaesthesia in order to unlock it”

Since then multiple studies have compared McMurray's test to Thessaly's test with differing claims of usefulness of both tests. Unfortunately, these days many people are relying solely on MRI scanning to make the diagnosis of a meniscal tear without correlating this with the patient's history and clinical examination. While an MRI is useful, it should be reserved for situations in which the clinician requires further information before arriving at a diagnosis. Indications for arthroscopy should be therapeutic and not based purely on radiographic findings.

Definite indications for surgery include longitudinal vertical tears (especially in the red-white or red-red zones) which are amenable to repair, horizontal cleavage tears in young athletes, hidden posterior capsulo-meniscal tears in ACL injuries, radial tears and root tears.

Many patients will do very well with non-operative treatment even when they have a meniscal tear. This is particularly true of the more degenerative tears in older patients. Deciding who to operate on for a meniscus tear cannot be based on a single test alone. A careful history and a combination of various clinical tests combined with advanced imaging makes the decision more clear. Unless the knee is actually locked or the tear type is included in the list above, a period of non-operative treatment is usually indicated to see if surgery can be avoided.

Dr Doron Sher