



**QUESTION | I have a patient in her 50s who has had a meniscus repair done. I thought that the studies showed no advantage when doing a knee arthroscopy in this age group? Why did this lady need surgery?**

**ANSWER |** Meniscal injury in the knee is common. There have been several large studies in recent years showing that operative and non-operative treatment can achieve similar results in the over 50-year age group. Having said that, reading the fine print in these articles, about 30% of patients fail non-operative treatment and cross over to the surgical group. They then achieve a 70% success rate with surgery. It is always worth trying non-operative treatment first though.

Unfortunately, there is a small cohort within this group who go on to develop rapid onset of severe arthritis within a year or two. It turns out that many of these people have a somewhat different type of meniscal tear called a meniscal root tear. Meniscal root tears are defined as radial tears located within 1 cm from the meniscal attachment. The menisci are attached to bone at the front and the back only with capsular attachment in between. When the meniscus tears away from its bony attachment it is biomechanically comparable to a total meniscectomy because of the loss of hoop stresses in the meniscus. This leads to increased contact pressures in the involved compartment which lead damage to the articular cartilage and the development of early osteoarthritis.

There are 2 age groups of people who get meniscal root tears:

1. The more common is the **over 40-year age group** who usually do not have a specific injury to the knee. They might stand from a seated position, squat or have a minor twisting injury. There is often sudden sharp pain in the knee (which is more severe than the symptoms usually experienced with a degenerative meniscal tear). This is almost always a medial sided tear. The risk factors for a medial sided root tear are: varus alignment, increased age, high body mass index and female sex. There are no specific clinical examination findings to distinguish a root tear from any other meniscal tear. The patient will typically have joint line tenderness, pain with full knee flexion, a positive McMurray or Thessaly's test and perhaps pain with varus stressing in full knee extension.
2. The second is the **under 40-year age group** and is mainly associated with ACL tears. This is usually a lateral sided tear and can be addressed at the time of an ACL reconstruction (although medial sided tears can occur as well). The lateral meniscus posterior root plays an important role in stabilizing the knee anteriorly and during pivoting. In patients with a grade 3 Lachman and pivot shift we should always look more carefully for a root tear. Repairing the lateral root helps to decrease ongoing forces applied to the ACL graft.

In most large series of arthroscopic knee operations, the overall incidence of a complete meniscus root tear is about 10%. Medial sided tears are much more likely to be associated with chondral injuries than lateral sided tears. There is a classification of 5 different types of tears but this affects mainly the surgical techniques of how to fix them rather than whether to fix them or not.

If you look specifically at the 'middle age' group and female patients, the incidence goes up to about 20%. In the past many of these patients were diagnosed as having spontaneous osteonecrosis (SONK) but in reality, this was probably a bone stress reaction from loss of meniscal function.

## **Investigation**

There are no specific xray findings for a root tear. Flexion weight bearing xrays are important because if the patient has varus alignment or more advanced arthritis then surgical treatment may not be appropriate.

The diagnosis is usually made on an MRI or at the time of surgery. The MRI needs to be performed on a 3T scanner with thin slices to have a decent chance of making the diagnosis. While the MRI is very helpful at ruling out a root tear, it is not necessarily that accurate at confirming the presence of a tear which will be amenable to treatment.

The signs to look for are: meniscal extrusion, a radial tear in the axial plane and the 'ghost sign', which is absence of normal meniscus signal in the sagittal plane.

## **Treatment**

In the past meniscal root tears were treated the same way as any other tear at arthroscopy. This meant that the patients underwent total or partial meniscectomy. While this does achieve short-term benefits for most patients, there is often a reasonably rapid deterioration and progression towards arthritis within a year or two.

Thanks mainly to Dr La Prade we understand the biomechanics of the injury; and repair of meniscal root injuries is the treatment of choice in the appropriate patients. The goal is to restore joint kinematics, contact pressures, and delay the development of arthritis. Since the goal of treatment of these injuries is the prevention of arthritis, surgical repair is not indicated for patients with diffuse advanced chondral changes (Outerbridge grades 3 and 4).

### Non-Operative Treatment

This is reserved for older patients with high grade and diffuse arthritis and those who will not manage a period of time on crutches to allow the meniscus to heal. The usual treatments of weight loss, pain killers, anti-inflammatory tablets, cortisone injections, activity modification and possibly an unloader brace can help to relieve some of the symptoms. These patients often progress to knee replacement reasonably quickly.

### Posterior Meniscal Root Repair

Anatomic repair of the meniscal root should be executed whenever possible. In my opinion the transtibial technique is the one that should be performed, drilling holes in the tibia to the meniscus attachment site, passing stitches through the torn meniscus, passing the sutures through the tibial drill hole and securing them anteriorly on the tibia.

### Post Operative Rehabilitation

In order to protect the repair, the patient will need to be non-weight bearing for 6 weeks and only achieve unrestricted weight bearing by about 3 months. If they take full weight before this, the repair is likely to fail. We aim for 0-90° of flexion for 2 weeks and then restore full range of motion. It is best to avoid leg presses and squats > 70° of flexion for about 4 months. Sport is delayed for 6-7 months.

## **Summary**

Meniscal root tears are far more common than we once realised. The current push to treat all patients over 50 without surgery will mean that 10% of patients will develop advanced arthritis which could have been prevented or at least delayed. The management of meniscal root tears is evolving and as we follow these patients for longer it will become clearer who the ideal candidate for surgery will be. We are already seeing improved clinical and radiological outcomes compared to a partial meniscectomy. If you have a patient with pain that is worse than you expect or who has clear clinical evidence of a meniscus tear but a reasonably normal looking xray then consider getting a high-resolution MRI scan or referring them for early assessment and treatment. Holding on to them for too long may lead to damage to their articular cartilage and a missed opportunity for treatment.

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