# How to treat meniscal injuries

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**As the shock absorbers of the knee, the menisci may be subject to acute or degenerative tears.**

THE menisci are discs of fibrocartilage between the tibia and the femur. They act principally as shock absorbers, but their other functions are to provide stability to the knee joint, to improve proprioception, to allow force transmission and to

improve lubrication and nutrition of the joint.

They form two crescent-shaped wedges between the femoral condyles and tibial plateaus.

Anatomically, the menisci are considered extensions of the tibial surfaces. Generally, the outer border is convex and is the thickest portion of the meniscus and is attached to the adjacent capsule. The shape gradually tapers to a narrow central margin. The undersurface resting on the tibia is generally flat, while the superior surface is concave, conforming to the shape of the femoral condyles. The anterior and posterior attachments are the only direct bony anchors of the menisci.



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With weight bearing, the femoral condyle is forced down on the meniscus. The menisci transmit a portion of the axial forces across the knee joint by converting this load into ‘hoop stresses’. They are relatively mobile structures and their motion during knee flexion is determined by their shape and soft tissue attachments/constraints.

With knee flexion, the menisci deform and change their radius, maintaining congruency with the changing shape of the femoral condyles at different angles of flexion. In normal knees, the anterior cruciate ligament prevents the forward tibial displacement (which allows the meniscus to contribute minimally to stability).

The lateral meniscus is more mobile than the medial and does not serve as a significant block to anterior tibial translation because of its increased mobility when compared with the medial meniscus.

With the knee straight, at least 50% of the compressive load of the knee joint is transmitted through the meniscus, and with the knee bent to 90 degrees, approximately 85% of the load through the knee joint is transmitted through the meniscus.

Meniscal tears can be traumatic or degenerative in nature, are either partial or full thickness, and are stable or unstable.

Traumatic tears are uncommon under 10 years of age but become increasingly common during and after adolescence.

Degenerative tears can be found in as much as 60% of the population over age 65. The majority of these tears are asymptomatic and occur in association with degenerative joint disease, and affect the medial meniscus posterior horn.

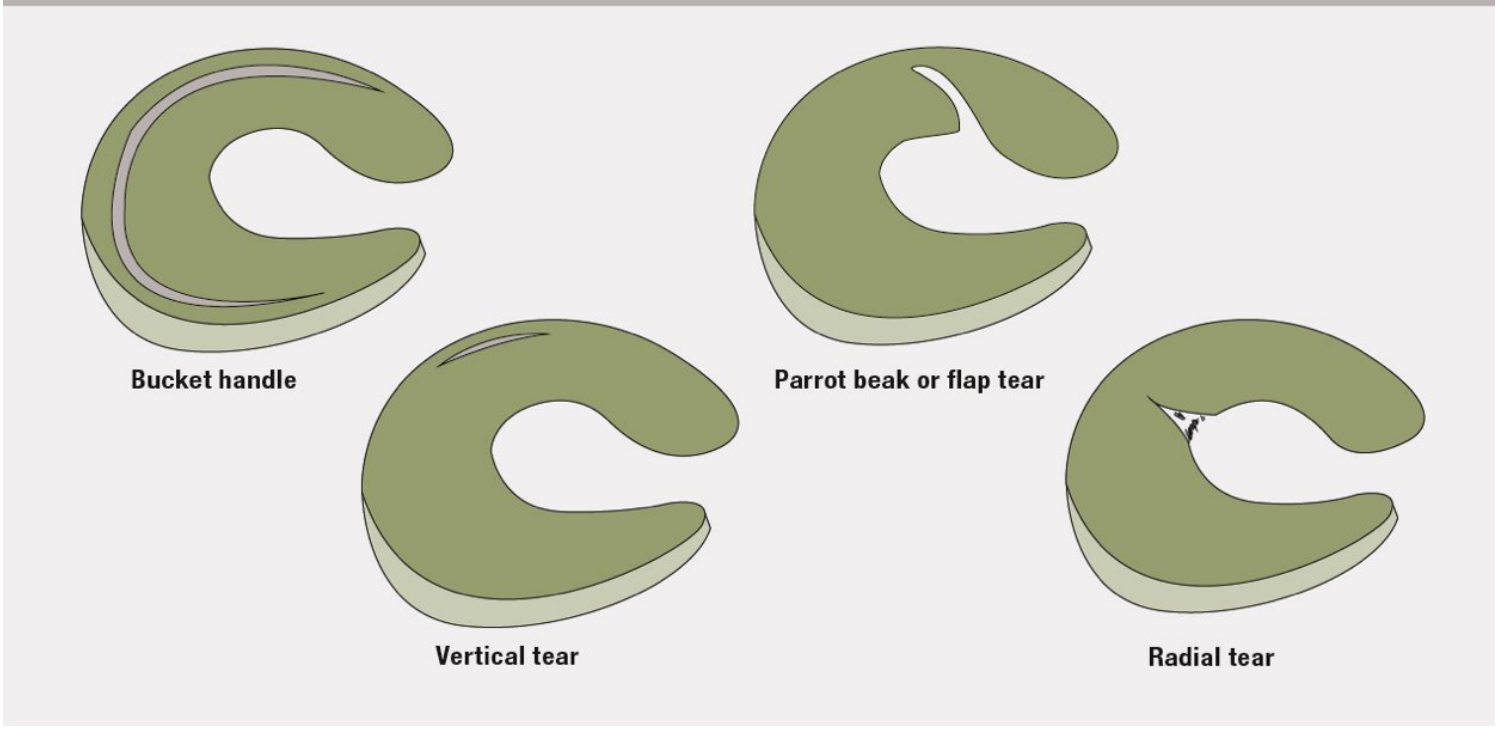
These do not require surgery.

The changing patterns of meniscal injury with increasing age most likely correlate with normal alterations in collagen fibre orientation with ageing, as well as increasing intrasubstance degeneration.

An unstable tear is one where the tear can be displaced into the joint space.

This has the potential to become trapped and be responsible for symptoms of catching, locking and pain.

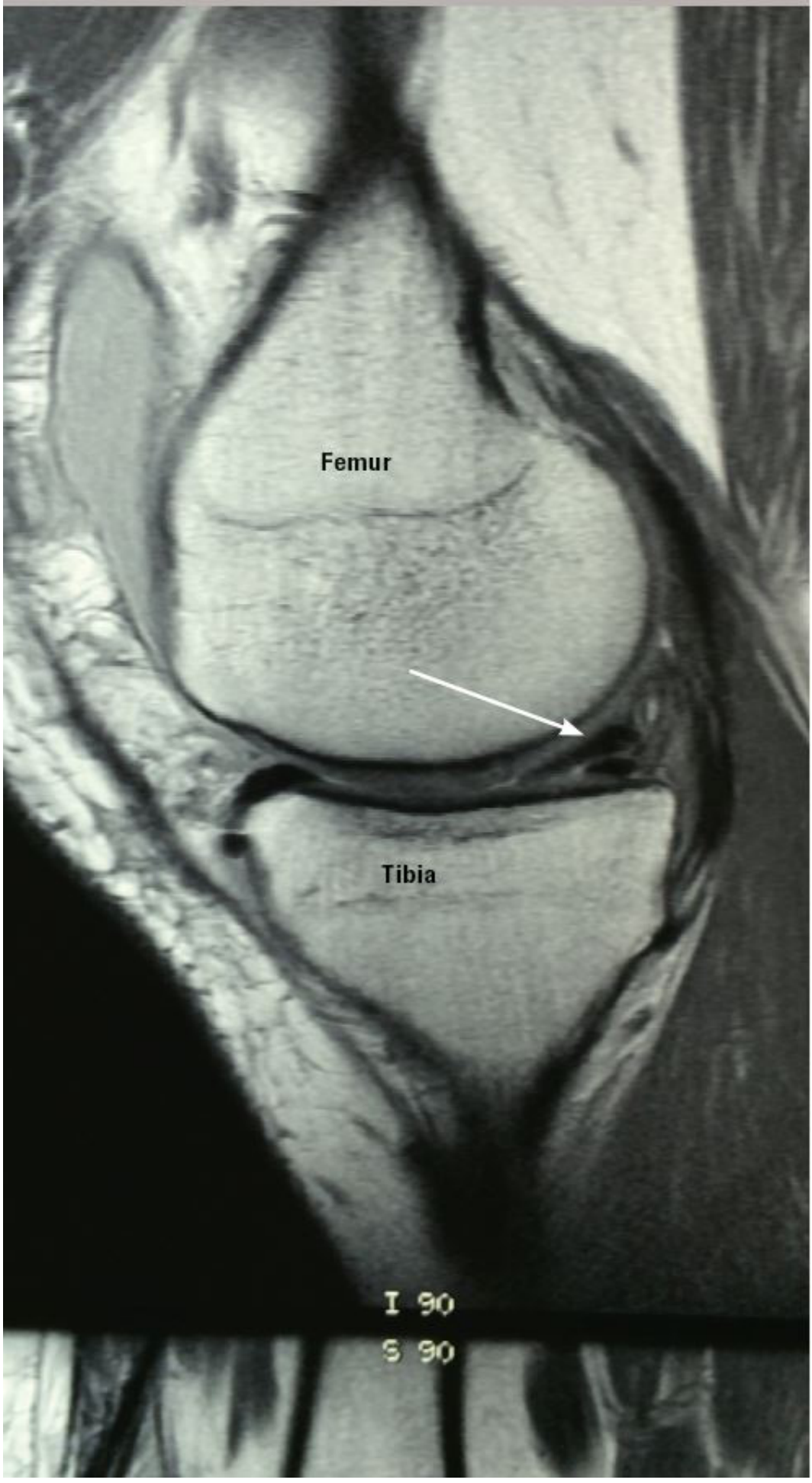
Figure 1. Examples of meniscal tear patterns.




Meniscal injuries can be further classified based on their tear patterns (Figure 1):

- Bucket handle tear
- Parrot beak or flap tear
- Vertical tear
- Radial tear.

Figure 2. An MRI image showing a meniscal tear (arrow).



The peripheral meniscal blood supply is essential to successful healing of repaired menisci.

There are three zones. The red-red zone is fully within the vascular area and has excellent healing potential; the red-white zone is at the border of the vascular area and has good healing potential; and the white-white zone is within the avascular area and has poor healing potential.

Several factors must be considered in determining the suitability of a meniscal tear for repair: patient age; chronicity of the injury; type, location and length of the tear; and associated ligamentous injuries.

Most patients with a repairable meniscus are younger than 45, and up to 80% are associated with an acute or chronic tear of the anterior cruciate ligament.

Regardless of the amount of pre-operative information available or number of tests done (such as an MRI), the final decision about whether or not to repair a meniscus is made at the time of arthroscopy.

This requires careful evaluation with the use of a probe by the surgeon to determine the exact type, location and extent of the tear as well as the degree of damage to the meniscus.

Depending on the size and location of the tear, there is approximately an 85% chance of having successful healing after a meniscal repair. Normal activities can usually be resumed at six months.

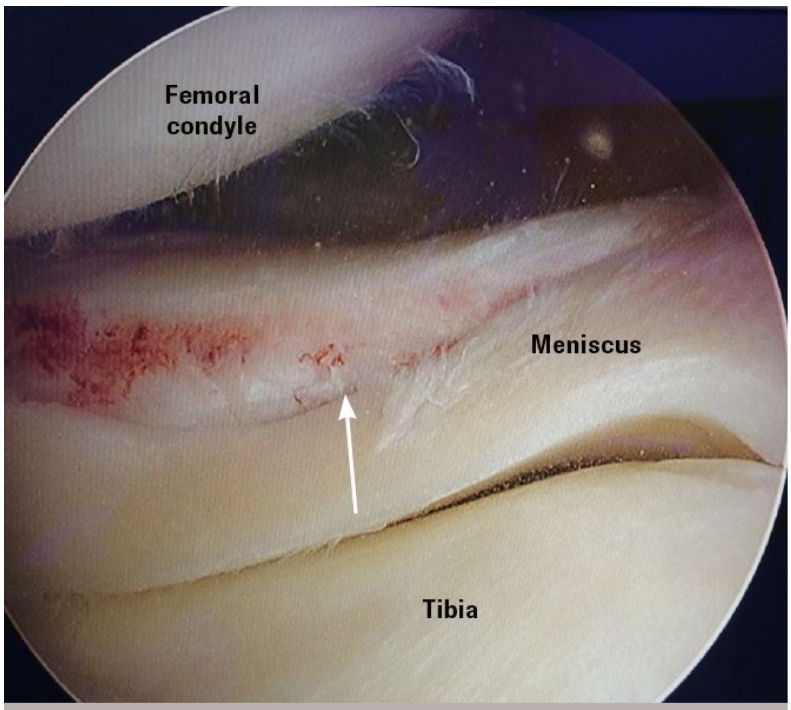



Figure 3. A meniscal tear at arthroscopy (arrow). Ultimately the decision to repair the meniscus is made at the time of surgery.

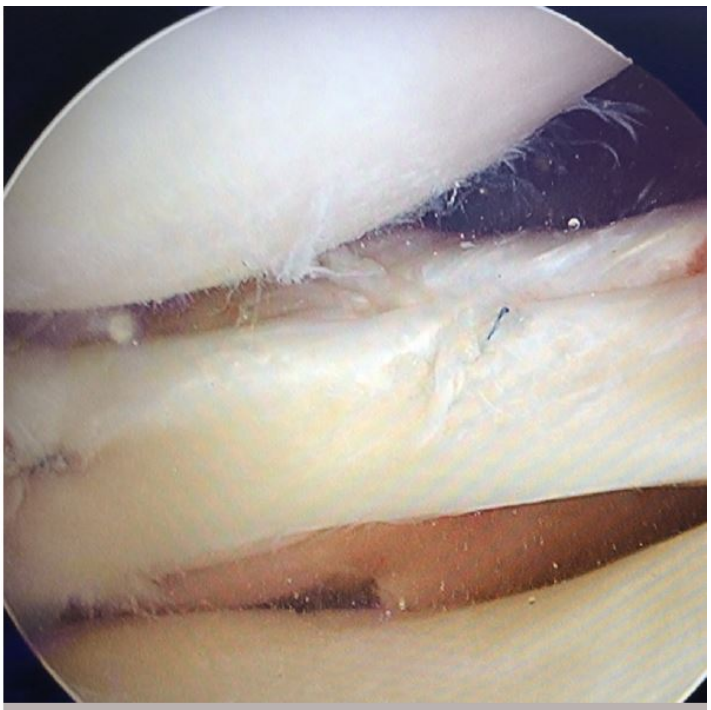


Figure 4. Post repair.