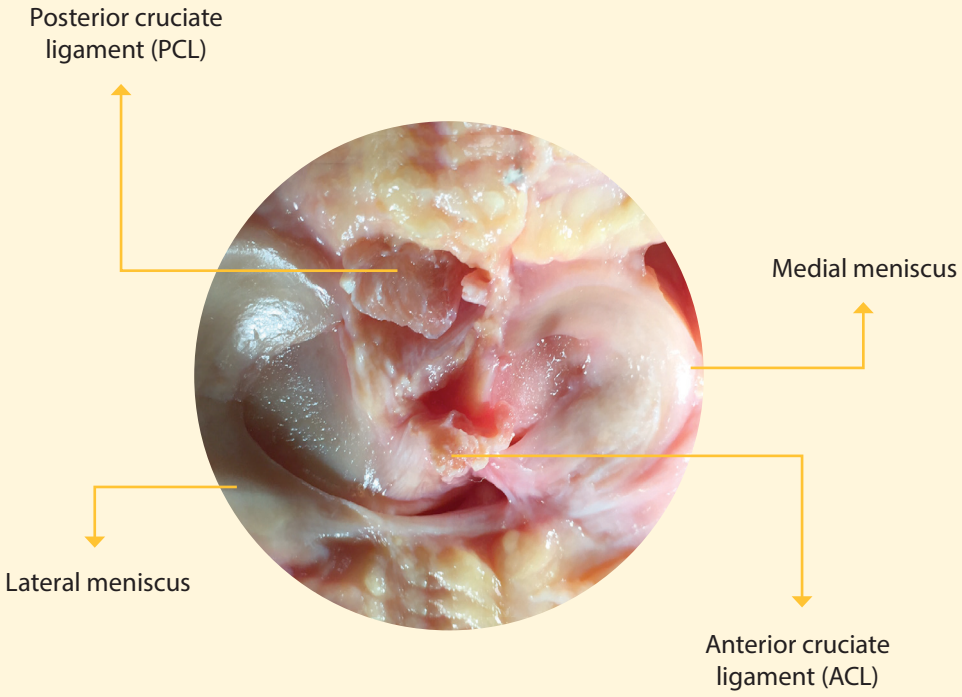
Understanding Meniscal Injuries

Changi General Hospital
SingHealth

What is a meniscus?

They are two C-shaped pads that is found in the knee. In each knee, there is one pad on the inner side (medial meniscus) and another on the outer side (lateral meniscus).

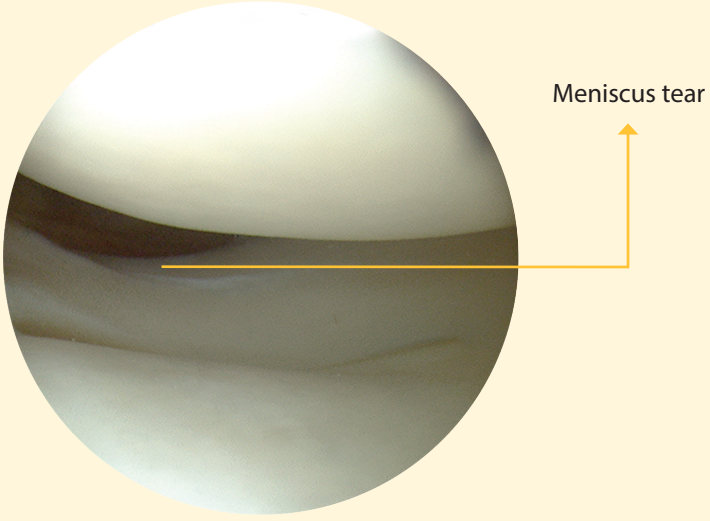
The meniscus has blood supply supplied from its outer attachment or periphery. A significant part of the meniscus (central region) has limited blood supply and this will have an impact on meniscus healing.



What are the functions of meniscus?

- Reduce load transmission across the knee
- Influence the stability of the knee joint
- Role in joint proprioception and cartilage nutrition
- Protects anterior cruciate ligament (ACL) graft in ACL reconstructed knee

It has been shown that loss of the meniscus tissue increases point loading, resulting in premature wear of the knee and progression of radiographic knee osteoarthritis.



Posterior horn longitudinal meniscus tear

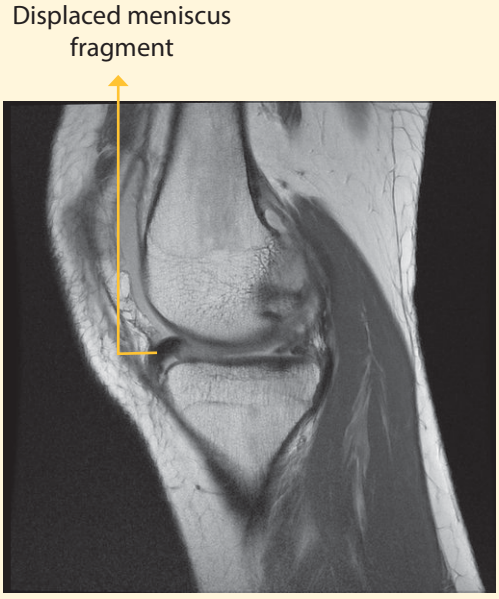
What are injuries of meniscus?

Meniscus tears are among the most common knee injuries. Athletes, especially those who play contact sports, are at risk for meniscus tears. However, anyone at any age can sustain a meniscus injury.

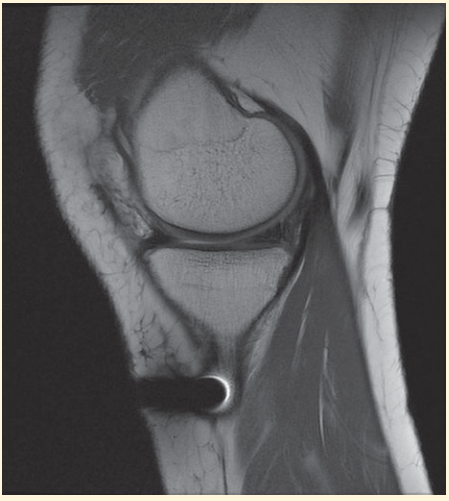
Symptoms include:

- Localised knee pain and tenderness
- Knee swelling
- Catching or locking of the knee
- Inability to fully straighten the knee
- Feeling a 'pop' in the knee

These tears can be diagnosed with a thorough history and physical examination. A knee Magnetic Resonance Imaging (MRI) may be used to assist in making the diagnosis.



Pre-operative sagittal MRI showing a bucket handle medial meniscus tear



Post-operative sagittal MRI showing repaired intact medial meniscus with good healing

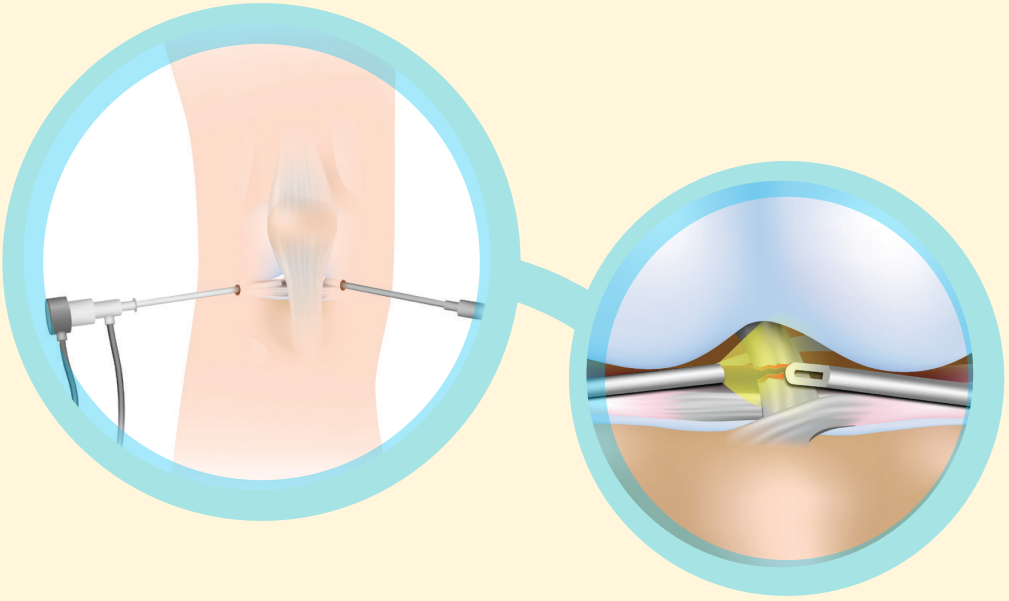
Treatment options

Conservative treatment with physiotherapy

This is an option when the tears seen on MRI are small or degenerative in nature and the patient has no symptoms. The patient should avoid pivot sports and squatting. They should work on knee quadriceps strengthening. Surgery may be still indicated if pain or swelling recurs.

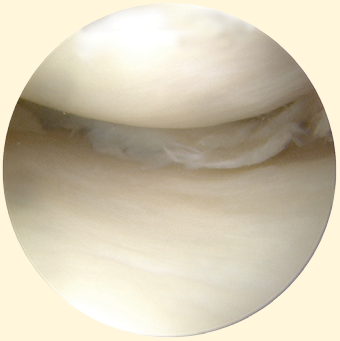
Arthroscopic surgery

During arthroscopic surgery, the surgeon has two options, to remove the torn part of the meniscus (partial meniscectomy) or repair the torn meniscus with stitches (meniscus repair).



a) Partial meniscectomy

Partial meniscectomy is performed to remove the torn segment of the meniscus which cannot be repaired or may not heal even when repaired (especially the central part of the meniscus which is avascular). The purpose of excising the torn meniscus is so that the torn segment will not get caught during movement, causing pain. In older patients with a degenerate meniscus, this choice is the usual treatment because the poor meniscus tissue quality may not be amenable to repair.

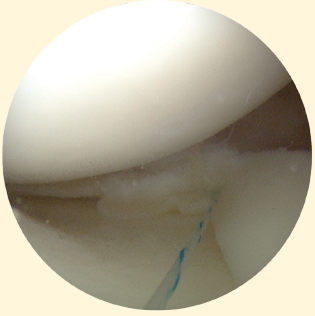


Irreparable meniscus tear with friable tissue that will need a partial meniscectomy

b) Meniscus repair

In younger patients, meniscus repair is preferable where possible. Repairing the torn edge of the meniscus allows the meniscus tissue to heal in their proper place and enables the meniscus to function as a cushion in joint protection.

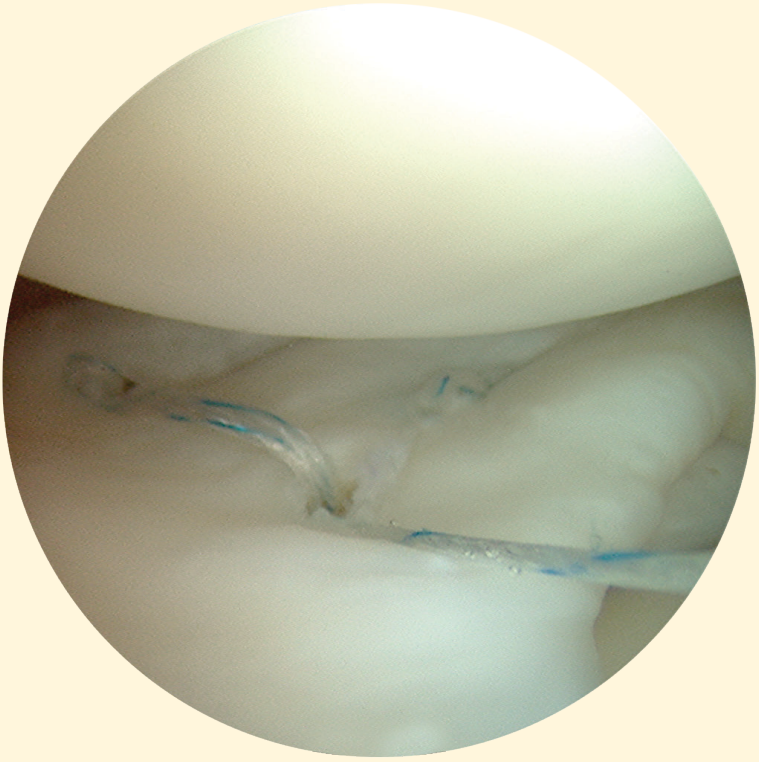
Meniscus repair involves the use of stitches placed with arthroscopic visualisation to suture the torn meniscus edges. About 50 percent of ACL injuries have associated meniscal tears; surgery will be then be performed to reconstruct the ACL and repair the concomitant meniscus tear. The results of meniscus repair are more successful when the ACL is also reconstructed simultaneously.



Repair of complex radial meniscus tear with all-inside meniscus repair device

Why should we repair the meniscus?

- To reduce knee pain and recurrent knee swelling
- To protect the knee from accelerated knee osteoarthritis
- To improve the knee stability especially in ACL reconstructed knee as an intact meniscus protects the graft



Placing a stitch across
a meniscus tear

What are the types of meniscus tear?

There are different patterns of meniscus tears: vertical tears, bucket-handle tears, horizontal cleavage, flap tears, complex tears and root tears.

Bucket handle medial meniscus tear

Radial tear of lateral meniscus

The meniscus tear pattern and the level of meniscal tissue degeneration will determine if the tears are reparable. If the meniscus tear is reparable, these two factors also influence the success of the repairs.

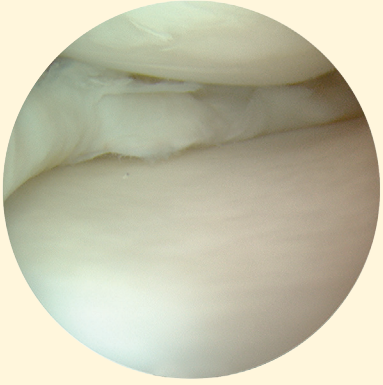
How do we repair the meniscus?

The meniscus repair starts with abrading the torn meniscus edges and synovium to stimulate tissue healing. Meniscus repair involves the placement of meniscus stitches across the tear with the aid of knee arthroscopic visualisation.

The commonest method is the use of all-inside knee meniscus repair devices to place stitches in the meniscus. These meniscus repair devices use small non-metallic implants (about 1mm size) that sit outside the knee posterior capsule.

For the inside-out or outside-in meniscus repair techniques, additional skin incisions around the knee may be required to accomplish the repair.

Repair of radial tear lateral meniscus



Reduction and repair of bucket handle meniscus tear

How successful are meniscus repairs?

The success of a meniscus repair is dependent on:

- Blood supply. Meniscus repairs in the outer portion of meniscus (periphery with good blood supply) are likely to heal in over 80 percent of the time. For horizontal tears, radial tears, complex tears and tears which involved the less vascular zone, the success rates after meniscus repair are lower. If the meniscus repair fails, a second surgery may be necessary to remove the re-torn meniscus.
- Meniscus tissue quality. Older patients usually have degenerate meniscus tissue and this may not allow for robust meniscus repairs to be performed. Meniscus repairs in older patients are less successful.
- Patients must be compliant with the post-operative rehabilitation after a meniscus repair to allow for optimal meniscus healing.

Pre-operative MRI bucket handle medial meniscus tear

Post-operative MRI ACL reconstruction and bucket handle medial meniscus tear repair

Post-surgery rehabilitation

After meniscal surgery, rehabilitation with a physiotherapist is needed to restore knee range of motion, strength and movement control. The size, location and complexity of the meniscal tear will determine the rate of post-operative progression.

For knee meniscus repairs, patients usually have to be on crutches for protected weight-bearing for six weeks. The range of motion of the operated knee may have to be limited with the use of the brace as well. The patient will usually be allowed to have full weight bearing and full range of knee motion six to eight weeks after meniscus repair.

For isolated knee menisectomy surgery, there is usually no need for the use of crutches and restriction of knee range of motion.

Limitations after surgery

- Patients may have difficulty using the operated knee in activities such as driving for up to eight weeks.
- After isolated meniscus repair surgery, patients are allowed to:
  - jog only at least four months after surgery
  - return to pivot sports at least six months after surgery
- They must regain their lower limb strength before they can return to sports.

Save the meniscus: The importance of meniscus preservation is now well understood!

Our team of surgeons, nurses, physiotherapists and sports trainers in Changi General Hospital are ready to manage all types meniscus injuries, meniscus deficiency and complex knee reconstructions.

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