



## Meniscal Injury & OA

### Some interesting facts on **meniscal injuries & OA of the knee:**

In full extension, approximately 45-50% of weight-bearing load is transmitted to the menisci. In flexion, this increases to 85%. This is part of the reason why the menisci are more vulnerable to injury in flexion. On the medial side, loading between the meniscus & bone is fairly even, however on the lateral side the meniscus takes approximately 80% of the load. Please contact us if you would like a printable copy of this document.

### Effects of meniscectomy:

- Removal of the medial meniscus decreases contact area at the medial femoral condyle by 50-70%, & doubles stress on the medial tibial plateau.
- Removal of the lateral meniscus decreases lateral femoral condylar contact area by 45-50%, but increases contact pressures by 235% to 335%!
- Removal of just the medial third of either meniscus decreases contact area by only 10%, but increases contact stress by up to 65%!
- Removal of >50% will guarantee degenerative changes to be worse on XRay at 12 years.
- "It is not the meniscectomy that leads to OA. Once torn, the meniscus is no longer able to function as a shock absorber".

For these reasons, current practice has changed & when possible, surgeons are much more likely to opt for repair rather than removal.

### Meniscal injuries:

Tears are thought to occur in 61 per 100,000 people. Clinical diagnosis is made by findings of:

- Joint line tenderness
- Pain with forced flexion
- Positive McMurray's test
- Loss of extension
- Clunking
- There may be no swelling. Isolated meniscal tears don't cause swelling, but if chronic swelling is present this may be an indication of chondral damage.

### Investigations:

- Always start with plain XRay
- MRI is being increasingly used, but has significant limitations:
  - o Many false positives:
    - 30% of asymptomatic contralateral knees also had a torn meniscus (Am J Rheum 2003)
    - 76% of matched control volunteers had tears (JBJS 2003)
    - 13% of asymptomatic volunteers <45 yo had tears, & 36% over 45yo (Clin Ortho & Rel Res 1992).

\*MRI results should be used with caution, & results compared to clinical signs & symptoms.

### Meniscal Repair:

Repair is more likely to be undertaken when:

- The patient is active & < 60yo
- At the same time as knee reconstruction or osteotomy. The more invasive surgery releases growth factors etc which will assist cartilage repair.
- If the tear is reducible, there is good tissue integrity, & it is likely to maintain a good position within the joint once repaired.
- A 'red-on-red', & certain 'red-on-white' repairs. White-on-white repair will not succeed.

Repair is unlikely to be performed when:

- It is the inner 1/3 (white-on-white)
- The patient is older than 60 & sedentary
- The tear is degenerative or of poor quality.
- Smaller tears, particularly if they have capacity for healing on their own.

Results of repair:

- In the correct circumstances, in a patient of middle age or younger, approximately 85% success
- Lateral side repairs recover more slowly (6 versus 3 months) but have the same long-term recovery.
- Results at 15 years in 'younger patients' (? what ages), results were 88% good to excellent.
- Results will be less satisfactory in:
  - o Older patients - <60%
  - o Females
  - o Where there is co-existing chondral damage.

### Arthritis:

Arthritis represents a biomechanical failure of the articular cartilage, which alters the way forces are transmitted within the joint. Changes include an increase in cartilage water content, loss of glucosaminoglycans, & reduction in tensile strength & resilience of cartilage. Softening / disintegration of cartilage leads to:

- Loss of normal joint space
- New bone formation / growth at joint margins
- Thickening of the joint capsule
- Thickening of the subchondral bone
- Possible presence of loose particles within the joint
- In the bone:
  - o Focal trabecular degeneration
  - o Subchondral cysts
  - o Reactive sclerosis (increased vascularity)
  - o Endochondral ossification (osteophytosis)

### Causes of Arthritis:

- Genetic factors
- Metabolic causes
- Hormonal factors
- Usage
- Mechanical stress
- Pre-existing disease
- Meniscal tears or articular cartilage injury
- There has been no proven relationship between activity level & incidence.

Arthrosis is seen on XRay in

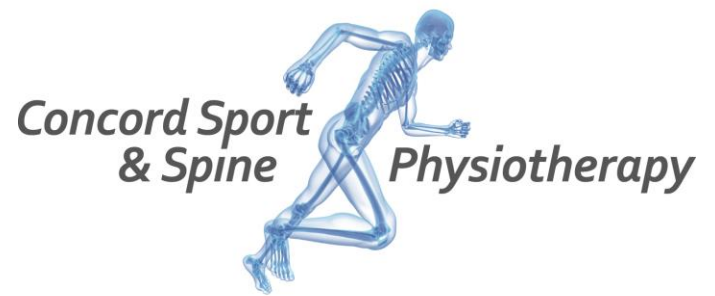
- 25% of 45-64 year olds
  - 85% of people older than 65
- In asymptomatic people over 65 years of age there is a 60% incidence of knee degeneration. When pain is present, it is normally due to the increased stress on unprotected bone. However it is still important to exclude other causes of the pain, particularly referral from the lumbar spine or hip.

Arthritis begins as mono-compartment disease in 70% of cases (higher incidence in Asians), & remains in 1 compartment for up to 20 years. When it progresses, a likely sequence will be:

- Intercondylar incarceration
- Rotatory subluxation
- Progressive ACL attenuation
- Bi- & tri-compartment OA

For information for doctors on physiotherapy management of all types of injuries visit:  
<http://www.cssphysio.com.au/Doctors/forDoctors.html>

Information for patients is at:  
<http://www.cssphysio.com.au/forpatients.html>



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