

Knee Arthritis

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Introduction

Your referral by your General Practitioner with pain from knee arthritis has resulted in a consultation with a specialist who has taken a history, examined you, performed investigations and helped you come to a decision on the best treatment for you under the circumstances of your current medical condition. The purpose of this leaflet is to explain why osteoarthritis of the knee happens, and what can be done to relieve your symptoms.

What is Knee Osteoarthritis?

Arthritis is a degenerative condition of the cartilage on the surface of a joint. The cartilage provides a low friction, impact resistant, bearing that contributes to efficient pain free stability in posture and locomotion. Cartilage like any other tissue or material can be damaged by high pressure or repetitive loading. Normal cartilage is arranged in three layers on the supporting bone (Figure 1). The layers are formed from cartilage

cells and the hoops of collagen fibres supporting the glycosaminoglycans that provide the unique properties of cartilage.

As we age the proportion of the constituents change and make us more prone to damage (Figure 2). The 3 different layers have differing resistance to injury and differing abilities for recovery and healing.

When a surgeon removes the cause of the arthritis patients can recover from damage to the surface layers. However, it is less likely a patient will recover from damage to the deeper layers.

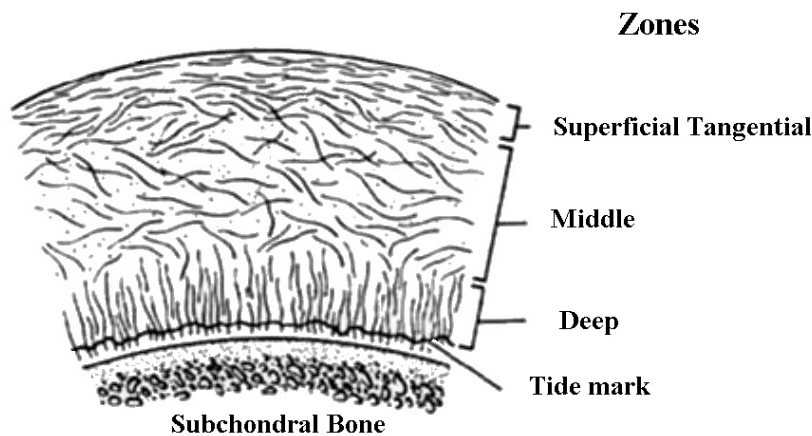


Figure 1. The layers of cartilage in a joint.

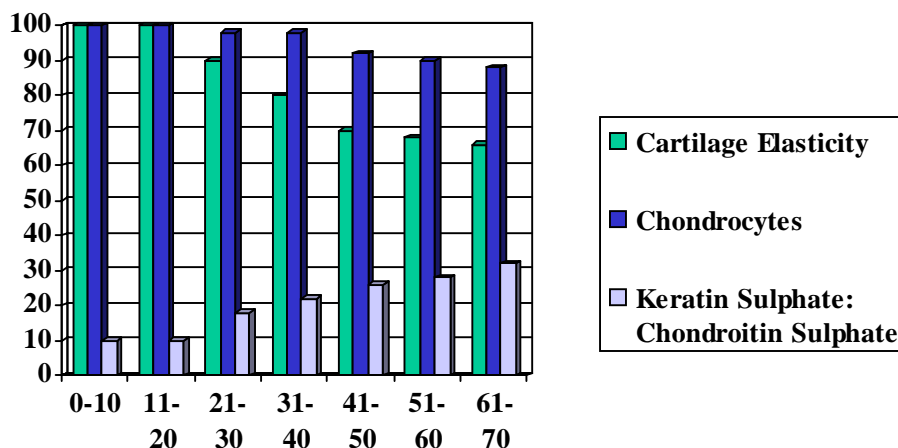


Figure 2. Changes of cartilage constituents with age.

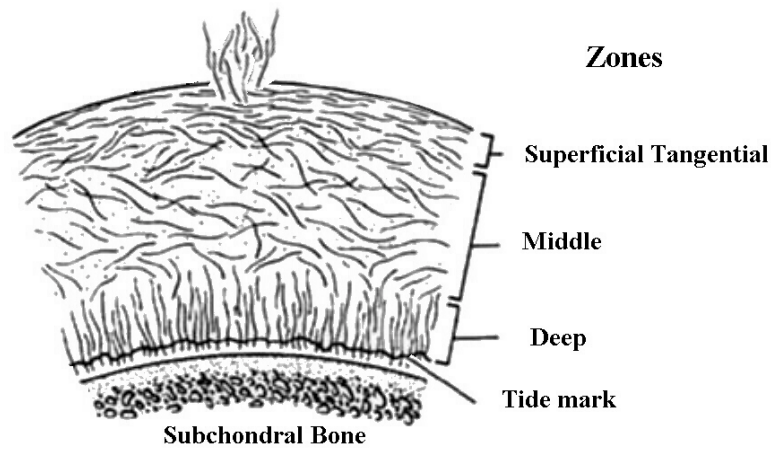


Figure 3. Early degenerate change of the superficial layer is recoverable if the cause is removed.

In the initial stages of injury only the superficial layers of the cartilage are damaged (Figure 3). This is termed grade 1 osteoarthritis (OA). If the cause of this injury is removed then recovery is usually complete.

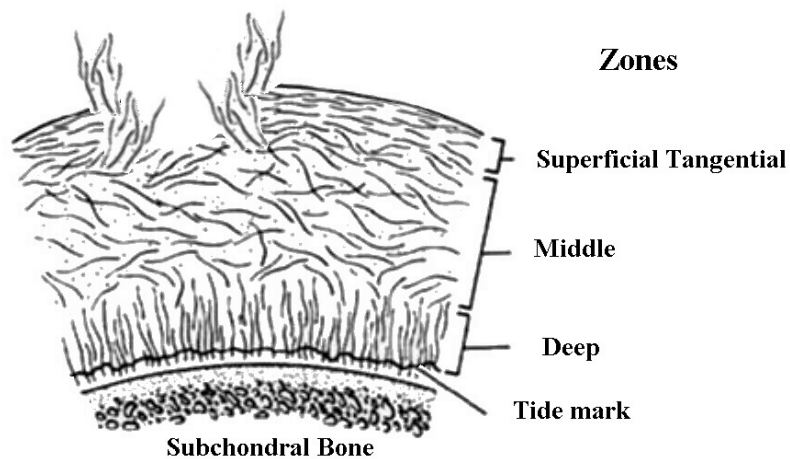


Figure 4. Grade 2 OA changes.

Later the damage extends into the middle layer but not through to the bone (Grade 2 OA).

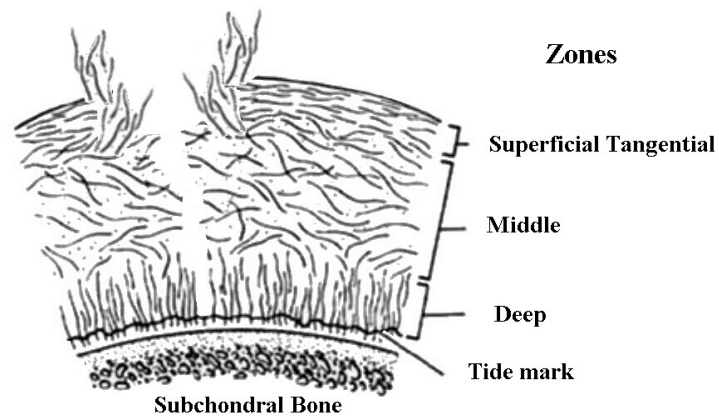


Figure 5. Grade 3 OA change.

In the worst injuries and in the patients that have put up with knee pain for months the cartilage is damaged through the middle layer to the bone which is still covered with some cartilage or bone that is no longer covered (grade 3 and 4 OA).

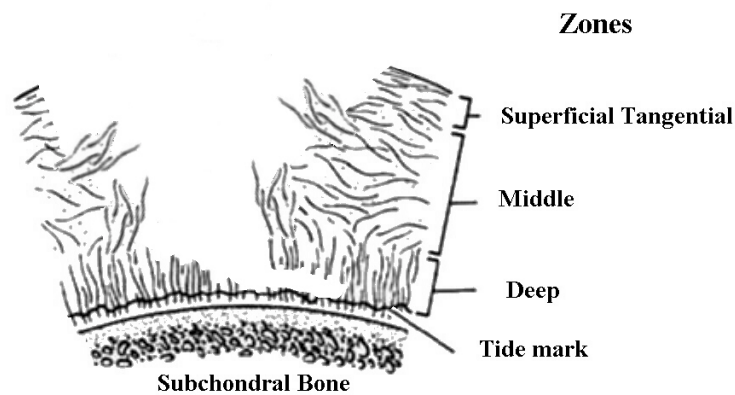


Figure 6. Grade 4 OA in which the underlying bone is exposed.

There are many causes of arthritis.

What Causes It?

The commonest cause of arthritis is mechanical wear and tear (osteoarthritis). This may happen from trauma (single load to failure) or repetitive loading above the endurance limit of cartilage (fatigue loading).

It is unusual to wear joint cartilage over a normal lifetime unless there is a genetic weakness of a patient's hyaline cartilage.

More usually the pressure rises due to an unstable tear of a meniscal cartilage. Interposition of a fragment of the cartilage between the joint surfaces causes a local rise in pressure. This rise in pressure causes the

failure of the joint surface cartilage. An analogy would be the difference in damage to a new wooden floor from a stiletto heel and a flat shoe. The stiletto heel with a small area causes high pressure. The flat shoe causes low pressure.

Similarly a neglected torn meniscus in the knee will cause rapid degenerate change of any underlying hyaline cartilage and osteoarthritis within approximately 2 years in an overweight individual and within 10 years with a normal weight of individual.

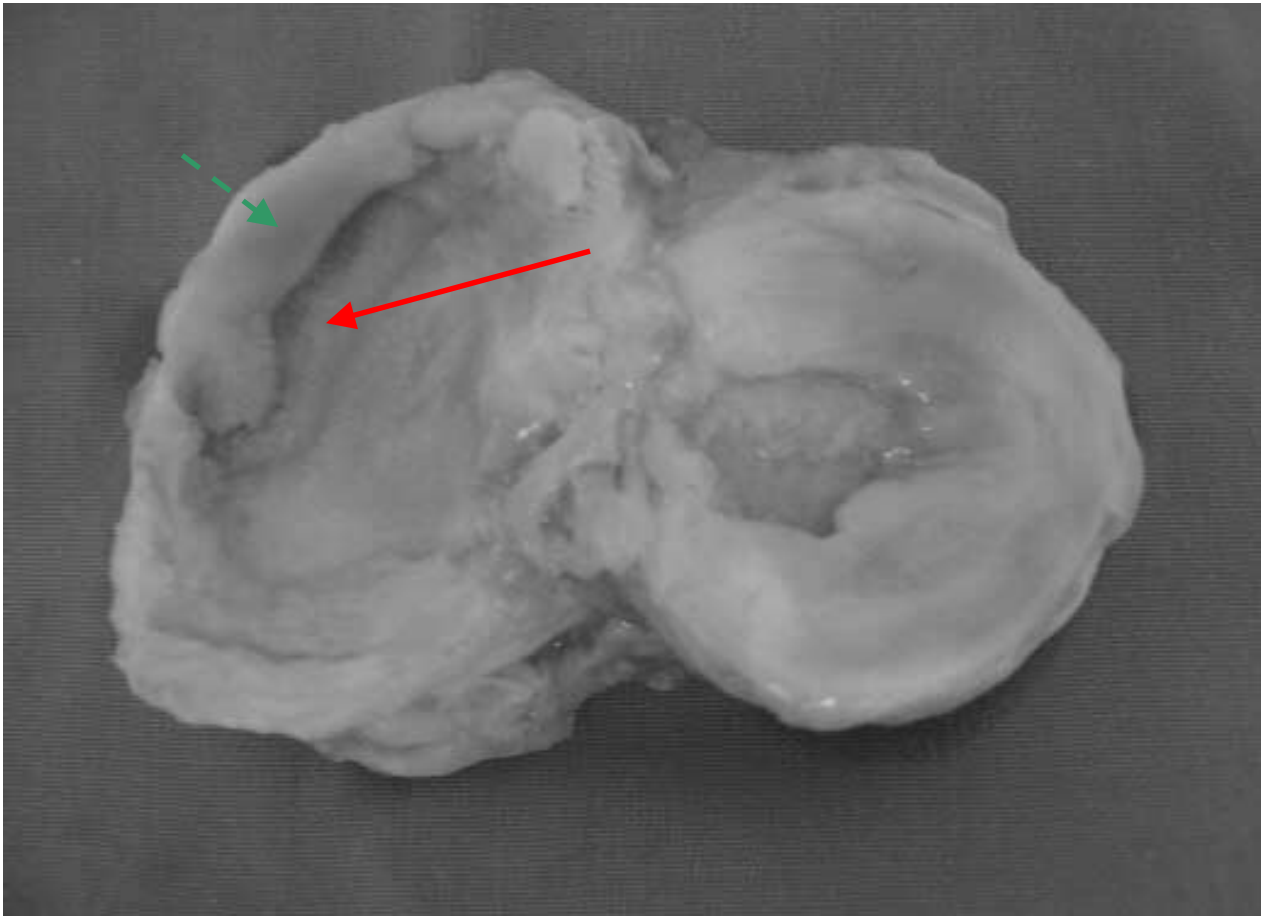


Figure 7. Green broken arrow neglected torn meniscus. Red arrow the localised osteoarthritis it has caused.

Other causes of secondary osteoarthritis include.

1. Infection
2. Neoplasia
3. Connective tissue disorders
4. Autoimmune disorders
5. Necrosis
6. Blood dyscrasias
7. Endocrine disorders
8. Diet, Drugs and Deficiencies

How Is It Diagnosed?

The symptoms of arthritis include pain (intermittent at first gradually becoming persistent), swelling, redness, heat and loss of function. The pain from the torn cartilage or loose body is often well localised by the patient. The pain from late generalised osteoarthritis is often poorly localised.

The clinical signs of osteoarthritis include swelling, tenderness, warmth, redness, loss of range of movement, crepitus and deformity.



Figure 8. The pain of an unstable torn meniscal cartilage is often well localised.



Figure 9. Deformity due to advanced osteoarthritis of the inside of the left knee due to missed medial meniscal tear.

X-rays and MRI scans may well be undertaken in most cases.

How is osteoarthritis prevented?

If a patient has had pain for less than 6 weeks and no arthritis then, unless the knee has locked because of a large meniscal tear, it should be treated conservatively. Small or stable tears of the cartilage can resolve with conservative treatment such as weight loss, walking stick, analgesics and non-steroidal anti-inflammatory drugs. The effectiveness of non-surgical treatment may be short lived.

If a patient's pain has persisted for a period of greater than 6 weeks then early well localised symptoms should not be ignored for fear of causing degenerate changes that progress to osteoarthritis. If a meniscal tear has been confirmed by MRI then the only cure for the symptomatic and therefore unstable meniscal tear is day case keyhole surgery to remove or repair the unstable component of the torn cartilage. If this is not achieved then the degenerate changes will progress to frank arthritis as a result of the unstable meniscal tear jumping into the joint and producing areas of high pressure degenerate change on the cartilage on the surface of the joint.

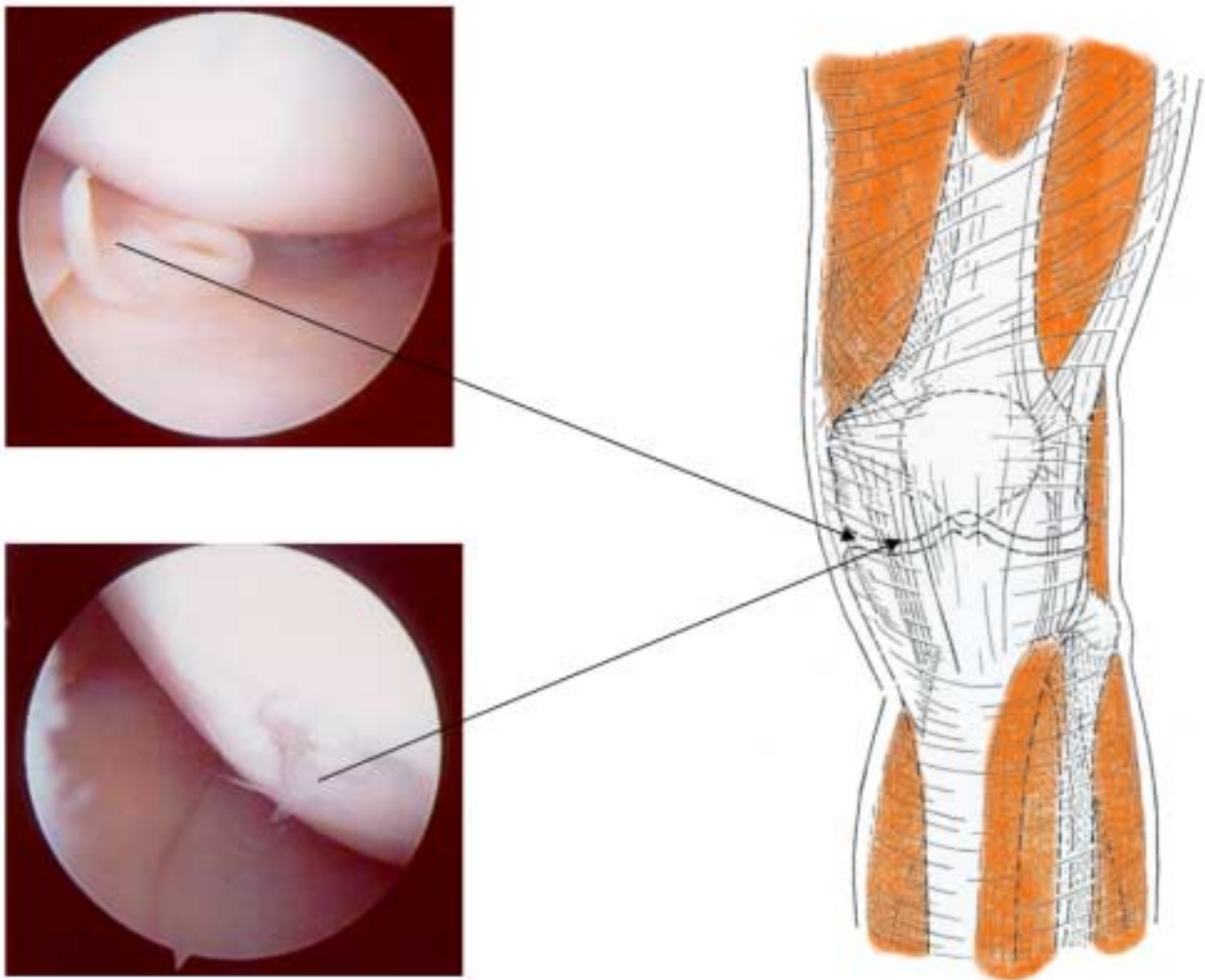


Figure 10. Operative images of a meniscal tear and the grade 2 changes of the surface of the femur that occurred as a result of this neglected unstable tear of the meniscus. Trimming the tear might prevent a knee replacement in the future.

Operative Treatment

Surgical treatment for an unstable meniscal tear causing pain more than 6 weeks is day case keyhole surgery and partial menesectomy. Your surgeon will only remove the unstable portion of the meniscal tear. This is to minimise the risk of wear and tear due to point loading of the femur without the mechanical support of a meniscus. Some large tears can be repaired. Please see the “Meniscal Repair” Advice sheet for further information on meniscal repair. Some patients may not be suitable for day case surgery. Please ask your surgeon if you are suitable.

Surgical treatment for meniscal tear and early degenerate changes is day case keyhole surgery and partial menesectomy with chondroplasty. This requires more time and additional equipment to undertake satisfactorily. In some cases the cartilage in your knee can be replaced. Please ask your surgeon whether these technique are suitable for you.

If your meniscal tear has been neglected for a long time and you have grade 4 OA then your surgeon may offer you keyhole surgery if you have a well localised symptom of pain. However, you may be offered a knee replacement if your symptoms are severe enough to accept the risks of knee replacement. Your surgeon will only offer knee replacement if conservative methods to relieve symptoms have been tried and failed.

Benefits and Risks of Surgery

The benefit of keyhole surgery for degenerative changes due to an unstable meniscal cartilage is to halt the progress of arthritis. The risks of keyhole surgery are very much less than the risks of knee replacement surgery. Knee replacement surgery replaces the worn cartilage with metal and plastic. It relieves the symptoms of arthritis and restores some of the function lost as a result of the arthritis. You should expect your surgeon to take the time to discuss the benefits, risks and all of the alternatives with you. Ultimately the decision to proceed to surgery or not is your own. There are many alternative treatments for osteoarthritis as listed below:

- Weight loss
- Walking stick
- Physiotherapy
- Pain killers
- Aspiration and Injection
- Arthroscopic surgery
- Osteotomy
- Arthrodesis
- Hemiarthroplasty
- Total arthroplasty