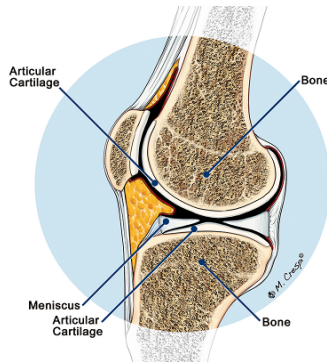


Osteoarthritis of the Knee

Osteoarthritis of the knee is a common condition and is becoming an increasingly important problem for the community as a whole.

In the normal knee joint the ends of the bones are covered with a type of gristle called articular cartilage. This surface has special characteristics that make it an ideal bearing surface. The articular cartilage needs to be distinguished from the meniscus, commonly called "the cartilage". The meniscus is like a gasket around the margins of the joint and fills in the gap between the rounded end of the femur and the relatively flat surface of the tibia. This distributes load over a larger surface area.



Osteoarthritis is a condition where the articular cartilage breaks down and is essentially worn away leaving the underlying bone exposed. On an X-ray this appears as a loss of the joint space between bones.



The X-ray on the left shows preservation of the joint space in very early osteoarthritis of the knee. The X-ray on the right shows established osteoarthritis with loss of the joint space.



There are many factors that can contribute to the development of osteoarthritis. Some individuals probably have a hereditary predisposition to the condition, as it does seem to run in some families. Females are more at risk of developing osteoarthritis than males. Obesity is a very important contributory factor as the biomechanics of the knee are such that the effect of extra weight is magnified in the knee joint. The effect is like a stiletto heel, where all the force goes through a very small area. Injuries to the knee can also contribute to the development of osteoarthritis. Such injuries include damage to the meniscus or articular surface itself and a tear of the anterior cruciate ligament.

The treatment of osteoarthritis depends on the severity of the condition, the symptoms, the lifestyle of the individual, as well as their age and general health. Fundamentally, treatment is aimed at relieving pain, rather than reversing or even slowing the degenerative process. In general, treatment can be divided into non-surgical and surgical options. As a basic principle it is always better to try non-surgical options before proceeding down a surgical path.

Non-surgical treatment

Simple Measures

- Strengthen thigh muscles - ride a stationary bike
- Lose weight
- Paracetamol

Non-surgical treatment starts with ensuring that there is adequate strength in the muscles around the knee and in particular the quadriceps muscle at the front of the thigh, and getting one's weight back to a normal level. Obviously it is difficult for many patients with osteoarthritis of the knee to exercise because of their pain. However, riding an exercise bike is a good way of strengthening the quadriceps muscle and at the same time burning calories, which will help in efforts to lose weight. However, dietary intake also needs to be modified as this has a much greater effect on weight than exercise. It may be helpful to seek specific advice from a dietician. As one loses weight and builds up strength in the quadriceps muscle it generally becomes easier to walk and this in turn will help with losing weight.

Using simple painkillers can be a very effective way of relieving symptoms and improving function. Paracetamol should be the mainstay of pain relief. Various formulations are available but the basic principle is that the total dose should not exceed 4 grams per day (8 standard 500mg tablets OR 6 slow release 665mg tablets). It is often helpful to take a larger dose of standard paracetamol (1000 - 1500 mg) in the morning. This will help get over morning stiffness and pain and may be enough for the rest of the day. An additional two tablets (1000mg) can be taken during the day if necessary. Slow release paracetamol is better when taken regularly (three times a day), but this can be inconvenient. Two tablets at night may help relieve night pain. When taken on a regular basis and in the right dose, paracetamol is both effective and safe.

Other Options

- Anti-inflammatories
- Nutraceuticals (glucosamine, chondroitin sulphate, fish oil, Lyprinol, turmeric)
- Cortisone injection
- Viscosupplementation
- Injection of blood products (PRP, Orthokine)
- Stem cells

Anti-inflammatory medications can also provide good relief of symptoms, both pain and swelling. However, they can all be associated with significant side-effects including indigestion and stomach ulcers, aggravation of high blood pressure and heart disease, and impairment of kidney function. They should therefore not be used indiscriminately and preferably only for short-term benefit. If your knee causes you most difficulty with activities such as golf or tennis, one strategy is to take anti-inflammatory medication on the day you are playing sport and perhaps the following day but then not again until you play sport the next time.

There are a number of so-called nutraceutical preparations that have become very popular. These include glucosamine, chondroitin sulphate, fish oil, green-lipped mussel extract (Lyprinol), and turmeric.

Some individuals find that they get good relief from these types of preparations but it is difficult to predict who will respond positively to them. At present there is little in the way of good quality scientific evidence to support their use. Fortunately they do not seem to have any significant side effects, so there is little harm in trying them. It would seem logical to try only one at a time. If it is unclear whether the preparation is helping, it is probably worth taking it for 3 to 4 months and then ceasing it. If your symptoms do not deteriorate once you stop taking the preparation then there is little reason to recommence it. There is no convincing evidence to suggest that one formulation of glucosamine is better than another, or whether the addition of chondroitin sulphate provides an additional benefit.

There are various groups of injections that can also be used in the treatment of the osteoarthritis. The first are cortisone preparations and these can be used for the relief of an exacerbation of symptoms, particularly if there is significant swelling. It is probably not a good idea to have a lot of injections of cortisone into the knee, as each injection is associated with a very small risk of infection of the joint. The second group of injections are the so-called viscosupplements. These are basically preparations of hyaluronic acid, which is one of the substances that make up the articular cartilage. There is some evidence to indicate that the use of viscosupplementation provides relief that is similar to that achieved with the use of anti-inflammatory medication or cortisone injections for up to 3 to 6 months.

More recently a number of blood preparations have become very popular. Platelet rich plasma (PRP) and activated serum (Orthokine) are two examples. Although some patients report benefit, once again larger studies have been less conclusive. Any effect seems likely to be as a result of an anti-inflammatory mode of action. Stem cell injections get a lot of media coverage but are expensive and are probably best regarded as experimental at present.

It is worth highlighting again that the use of any of the above is really aimed at relieving pain rather than slowing the progression of osteoarthritis in the longer term.

Surgical Options

Surgical options can be divided into three groups: arthroscopy, realignment procedures, and joint replacement.

Whilst arthroscopy is a relatively small and simple procedure and the idea of a "clean-up" operation seems attractive, there is increasing evidence to suggest that the use of arthroscopy for the treatment of the osteoarthritis provides little benefit compared to non-surgical options over a period of a couple of years. It may however still have a role in some specific situations such as the presence of a loose body in the joint. If used, an arthroscopy is only aimed at relieving symptoms and does nothing to slow the progression of the osteoarthritis. Indeed, it occasionally seems to aggravate the process and may bring on the need for a knee replacement more quickly than if the arthroscopy had not been performed at all.

One of the difficulties is that MRI is increasingly being used as the first imaging option for the knee. It is not usually very helpful in the setting of an osteoarthritic knee and is expensive. There can be a tendency to focus on the part of the report that describes the presence of a meniscal tear, rather than the parts that describe what is really osteoarthritis without using the word specifically. This can give the impression that there may be a role for an arthroscopy. This

is not usually the case. In general, good quality X-rays which including standing (weight bearing) images give enough information.

Realignment procedures are called osteotomies. These involve cutting the tibia or femur bone and changing the overall alignment of the leg to reverse a "bow-legged" or "knock-kneed" alignment. The aim is to take weight away from the part of the knee that is affected by osteoarthritis. Such procedures can only be used in certain patterns of osteoarthritis and are usually better suited to people under the age of 55. They can however provide good long-term relief and put off the need for joint replacement,



whilst at the same time allowing an individual to remain quite active.



Joint replacement involves shaping or cutting the bone ends and applying a metal or polyethylene component to the surface. Usually both sides of the joint are replaced. One can either replace all surfaces of the knee, which is a total knee replacement or the surfaces in just one part of the knee, which is a partial replacement. Like osteotomies, partial replacement can only be used for certain patterns of osteoarthritis. In general we try to put off joint replacement procedures for as long as possible because of

concerns about long-term wear and loosening. In addition, replacement procedures are only compatible with low impact sporting activities. Golf, social or doubles tennis, cycling, and snow skiing are reasonable whereas running, basketball, netball, or any type of football probably increase the risk of premature wear and loosening of the prosthesis.

These notes have been prepared by orthopaedic surgeons at OrthoSport Victoria. They are a general overview and reflect their views, opinions and recommendations. They do not constitute medical advice. The contents are provided for information and education purposes only and not for the purpose of rendering medical advice. Please seek the advice of your surgeon or other health care provider with any questions regarding medical conditions and treatment.