

Osteotomy of the knee

Knee Arthritis

Arthritis of the knee can be an extremely debilitating condition. The knee joint is lined by cartilage, which allows the surfaces of the joint to articulate smoothly, with minimal friction. Arthritis is when the cartilage becomes thin and deficient. In the process, the menisci (shock absorbers of the knee) also become torn. In severe cases, the cartilage is lost completely and the underlying bone becomes exposed. Bone may articulate against bone. This results in inflammation which causes pain and swelling.

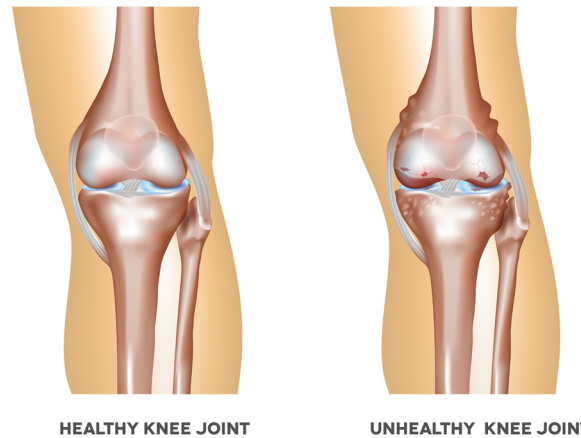
Initially, the pain is only activity related. Walking, rising from a seated position, stair climbing or squatting may cause discomfort. As the disease progresses, the pain becomes more severe, requiring less provocation. Ultimately, rest pain occurs and sleep is interrupted.

Arthritis occurs due to a combination of genetic and environmental factors. It often runs in families. Previous knee injuries, physical labor, repetitive loading and an increased body weight put the knee at risk of arthritis.

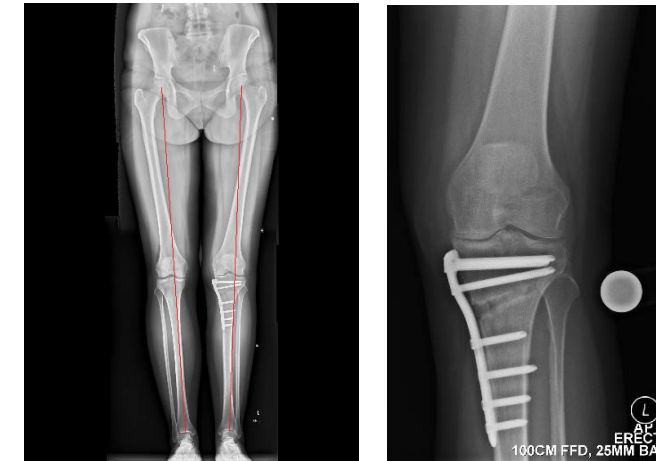
The non-operative management of knee arthritis involves regular low impact exercise (including swimming, a treadmill or stationary bicycle), weight loss, physiotherapy (for quadriceps strengthening), analgesia (including paracetamol and anti-inflammatories such as ibuprofen), walking aids, activity modification (avoiding stairs, inclines and lifting) and injections (cortisone, hyaluronic acid or PRP). These treatments unfortunately do not reverse the damage to the joint but are effective means to delay disease progression. The use of stem cells is currently not supported by the scientific literature and remains experimental with no benefit over the aforementioned treatments.

If pain and disability are still severely affecting quality of life despite a trial of the appropriate non-operative treatment, surgery may be

considered. In some instances, joint sparing surgery such as an osteotomy (breaking and realigning the shin or thigh bone to offload a diseased compartment in the knee) or arthroscopy (key-hole surgery) may be appropriate. Generally speaking, unless for very specific circumstances, such as painful locking from a loose body, knee arthroscopy in isolation is no longer indicated for the treatment of arthritis.



Arthritic knee compared to a healthy knee



Postoperative x-rays showing corrected alignment

High tibial osteotomy post operative x-ray

High Tibial Osteotomy

The treatment for end-stage osteoarthritis is a total knee replacement. Despite it being a very successful operation, there are limitations, particularly in younger patients. The main risk of the implants failing is significantly higher in younger patients who place higher demands on their knees. Thus in younger patients who have arthritis and who meet specific criteria, particularly having arthritis limited to one compartment in the knee, an osteotomy is an option. Depending on the compartment affected, either the femur (thigh bone) or tibia (shin bone) is surgically broken and realigned to change the alignment of the knee so that

less weight goes through the diseased compartment. A high tibial osteotomy (breaking of the shin bone, just below the level of the knee joint) is the most common osteotomy performed for knee arthritis in Australia. It is usually considered in patients under the age of 50. The operation is done under a general anaesthetic supplemented by a local anaesthetic block. It involves 1-2 nights stay in hospital. A knee arthroscopy is generally performed at the same time to directly assess the severity of the arthritis in the knee and to remove any loose cartilage or meniscus (shock absorber of the knee). The bone is broken and repositioned. X-rays are used to confirm that the new alignment is satisfactory before the bone is internally fixed with a plate and screws. Weight bearing is permitted immediately but a brace and crutches will have to be used for 4 to 6 weeks. Aspirin is used for 4 weeks to reduce the risk of blood clots. Physiotherapy starts immediately also. Stationary cycling and hydrotherapy usually starts 2-3 weeks after the surgery. It takes 3-6 months to recover fully from the operation.

Although the operation is done with utmost care, complications can occur. These are rare but include nerve injury, infection, blood clots, bleeding, fracture and non-union (osteotomy not healing).

This is a temporizing measure to relieve pain and to delay the progression of the arthritis but a knee replacement at some stage is usually inevitable. The plate and screws are usually removed at some stage, after the osteotomy has healed (at least 6 months). This may be due to the implants irritating the skin and the hamstring tendons or to facilitate future knee replacement surgery.