

Osteotomy for Osteoarthritis of the Knee

Osteoarthritis is essentially loss of the articular cartilage on the bone surfaces of a joint. Articular cartilage (also known as hyaline cartilage) is normally a very smooth surface with special biomechanical properties that make it particularly suitable as a bearing surface. However when the surface is disrupted, a process of breakdown commences and eventually the articular cartilage coating is worn off the bones. Unfortunately, articular cartilage has a poor capacity to heal.

For treatment purposes, the knee joint can be considered to consist of three compartments. One compartment is between the patella and the femur (patellofemoral compartment), and the other two are between the tibia and femur. One is on the medial (inside) half of the knee, and the other is on the lateral (outside) half of the knee. If the osteoarthritic process is isolated to either the medial or lateral compartment, one surgical option for treating significant symptoms is an osteotomy.



(Medial opening wedge tibial osteotomy for medial compartment osteoarthritis)

The principle of an osteotomy is to realign the lower limb in order to shift the line of weight bearing away from the affected half of the joint and into the good half of the joint. In other words, if the osteoarthritis is isolated to the medial compartment, the aim is to shift the line of weight bearing into the lateral compartment. The main aim of this realignment is to reduce the symptoms from the osteoarthritis and delay the need for joint replacement surgery. Realignment may also slow down the rate of its progression of the osteoarthritis. It is important to be aware that realigning the leg will result in an altered appearance of the shape of the leg. If people have medial compartment osteoarthritis, they are usually somewhat bow-legged and the osteotomy will make the leg slightly knock-kneed. The opposite applies for lateral compartment osteoarthritis. Prior to surgery the person is usually knock-kneed, but after surgery the leg is straight or slightly bow-legged.

Osteotomies can be performed above or below the knee joint. For medial compartment osteoarthritis, osteotomies are most commonly performed by operating on the upper tibia. If the osteoarthritis is in the lateral compartment, the osteotomy is usually performed in the lower femur.

The osteotomy procedure itself involves cutting the bone virtually completely. There are then two ways of realigning the bone. One is to take out a wedge of bone and the other is to make a cut and open up a wedge and fill it with either bone or a bone substitute. If bone is used it can either be allograft bone which is taken from a cadaver, or autograft bone which is taken from the patient, usually from the hip region. Some kind of metallic fixation device, usually a plate with screws, is then used to stabilise the osteotomy while it heals. In general there has been a trend moving away from so-called closing wedge osteotomies, where a wedge of bone is taken out, towards opening wedge osteotomies, where a cut is made and the wedge is opened. There are potential advantages and disadvantages of each technique and a decision regarding the most appropriate method will be based on your individual situation.

The surgery is usually undertaken under general anaesthetic. You are usually admitted on the day of surgery. Most people are in hospital for 2 or 3 nights. After surgery there is usually a drain tube in the wound, which is removed the morning following surgery. Depending on your surgeon's preference, a brace may or may not be fitted after surgery.

Initially you will commence walking with the aid of crutches. You may be able to partially weight bear immediately or remain non-weight bearing for up to 6 weeks following the procedure, depending upon your surgeon's preference. An X-ray will be taken at about 6 weeks after surgery and depending on how things are progressing, you should be able to gradually increase your weight bearing and discard your crutches over the next 2-6 weeks.



(Lateral opening wedge femoral osteotomy for lateral compartment osteoarthritis)

COMPLICATIONS

Like all surgery, osteotomies are associated with the risk of complications. The specific risks of an osteotomy include delayed healing of the osteotomy, infection, deep venous thrombosis, and incomplete pain relief.

DELAYED OR NON-UNION

Because a cut is made through the bone, there is effectively a fracture of the bone, which needs to heal. With opening wedge osteotomies in particular, this process can be relatively slow. If the osteotomy fails to heal, further surgery is necessary to encourage the process.

INFECTION

Infection is a risk of any surgery, not specifically related to osteotomy. Should infection occur, this will usually either be treated with oral antibiotics (tablets) or occasionally with intravenous antibiotics. Occasionally further surgery will be required to clean up the infection. This involves admission to hospital for a number of days during which intravenous antibiotics are given.

DEEP VEIN THROMBOSIS (DVT)

This is a blood clot in the veins of the leg. Precautions are taken to reduce the risk and this usually involves the administration of a daily injection of a blood-thinning agent (low molecular weight heparin). Additional measures may be taken if it is felt that you are at greater risk than the average person undergoing surgery. If a venous thrombosis does occur this will usually need to be treated with anticoagulant tablets (Warfarin), which would need to be continued for at least three months. A small but nonetheless important risk for venous thrombosis is the potential of the blood clot to break off and lodge in the lungs (pulmonary embolus). This can cause significant breathing problems and very rarely can be fatal.

ONGOING PAIN

Osteotomy is a useful procedure for people with unicompartmental osteoarthritis who are not suitable for joint replacement, usually because of their relatively young age. However, the outcome of surgery is probably less predictable than a joint replacement. Although most patients are happy with the result, pain relief is not always complete. In the longer term the underlying osteoarthritis will progress and one can expect knee pain to return.

In addition, surgery around the front of the knee is often associated with difficulty kneeling. This is more of a problem with tibial osteotomies than with femoral osteotomies. The metallic plate that is used to fix the osteotomy can be prominent, particularly in thin people. If this is the case the metallic hardware can be removed after about 12 months following surgery. This is usually done as a day or overnight case. Sometimes the metallic hardware is removed routinely after 12 months, although this is at the discretion of your surgeon. However, if a knee replacement is planned the hardware will need to be removed prior to this procedure.

These notes have been prepared by orthopaedic surgeons at OrthoSport Victoria. They are general overviews and information aimed for use by their specific patients and reflects their views, opinions and recommendations. This does 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 specific surgeon or other health care provider with any questions regarding medical conditions and treatment.

