

Knee Replacement Surgery

Over 100,000 knee replacements are now carried out annually in the UK. As a weight-bearing joint, a lot of strain is put upon the knee, and the effects of this and RA can lead to knee replacement surgery being necessary.

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Introduction

The development of knee replacement has been slower than hip replacement. Whereas the clinical results of total hip replacement have been satisfactory from the early 1960s, it is fair to say that total knee replacement did not reach the same level of success until the late 1970s and early 1980s.

The knee is a complex joint to replace. The original designs were simple hinges, but there is a rotational stress on knee joint, and this caused the hinges to loosen. Also, initially, the prostheses were relatively large, and a significant amount of bone had to be removed for their insertion. This presented a very difficult situation if they failed, as there was very little in the way of stability left in the knee joint.

The modern designs are really resurfacing replacements, in which relatively small quantities of bone are removed which lead to less in the way of problems if the operation fails. The results of knee replacement are now very nearly as good as hip replacement, and it would seem that the incidence of loosening in the long term is, in fact, less in the knee than in the hip. It is expected, therefore, that the current generation of knee replacements will actually be longer lasting than hip replacements. According to the National Joint Registry, over 100,000 knee replacements are now carried out annually in the UK.

What are the main reasons for having knee replacement surgery?

The primary reason for having knee replacement surgery is pain due to your RA. Typically pain significantly limits activities, particularly walking. There may be pain at night and pain at rest. There may also be deformity, stiffness and swelling. Increasing deformity may cause a problem and surgeons prefer to carry out surgery before deformity is severe. However, the majority of severe knee deformities can be corrected successfully using modern techniques and implants. If the knee is significantly stiff, then the range of movement can be improved by knee replacement: a range of approximately 120 degrees is the maximum that could be expected with surgery.

What does the operation involve?

Essentially the operation involves shaving off the ends of the bones: the femur (thigh bone), the tibia (shin bone) and the patella (knee cap). The patella is not always replaced, opinion amongst surgeons varies. The femur and tibia are then resurfaced with metal. A plastic spacer is inserted between the two metal components, and this is attached to the tibial component. The patella, if replaced, is resurfaced with plastic. The implants are usually anchored to the bone by acrylic cement, although some surgeons favour other methods of fixation, such as screws.

When cutting the ends of the bone, it is likely that any deformity will be corrected to ensure satisfactory alignment of the knee joint. The ligaments and other soft tissue will need to be carefully balanced and correctly tensioned. If they are too loose, then the joint will be unstable, and if they are too tight, there will be restricted movement.

The surgical wound is normally repaired in three layers, the capsule or covering of the joint, the fat layer under the skin and the skin itself. Instead of conventional interrupted sutures (stitches) the skin closure is normally now completed with a suture which lies immediately below the skin as this method gives a more cosmetic scar. Some surgeons, however, close the skin with metal clips, which need to be removed when the wound has healed.

Recovery

Sometimes a drainage tube may be placed inside the knee for the first 24 hours so that if bleeding occurs, the blood will be sucked out of the knee and will not cause pain and swelling. However, many surgeons no longer use a drain. It is unusual to need a blood transfusion after surgery in the modern era.

There are a number of methods for effective pain relief. Strong pain killing drugs are given on a regular basis by tablet or injection. Most knee replacement operations are now performed using spinal anaesthesia, which involves the anaesthetist injecting a spinal needle into the lower back area and injecting a substance which numbs the legs from the waist down. Many patients remain awake during surgery, but some are sedated, and some have a general anaesthetic, in which case they will be asleep.

A cryocuff or ice jacket can be placed around the knee to reduce pain and swelling, and anti-inflammatory drugs may be useful in the post-operative period, and patients are now often mobilised on the day of surgery. The haemoglobin level is normally checked after 24-72 hours. The length of stay in hospital has gradually fallen over the years, and discharge from hospital is expected after 2 to 4 days.

An X-ray is usually taken after surgery. It is difficult to make rules with respect to mobilisation, as every patient is different, but the majority of patients will be fit enough for discharge home 2-4 days after the operation, at which time they will be walking with support and able to negotiate stairs. After approximately 6 weeks most patients will be back to really normal day to day activities including driving (less for driving if it is the left knee and an automatic car) although it can take up to 12 months for a full recovery to be made. The knee may well be sore, tender, warm and irritable for several months. The scar takes a long time to settle down as the front of the knee is somewhat vulnerable. Kneeling is initially quite painful, this may become easier, but the ability to kneel varies following a knee replacement.

Understanding the risks of knee replacement surgery

Patients now need to be able to give an informed consent for surgery, and this means having an understanding of problems that may occur. Overall the risks from joint replacement have reduced over the last 20 years, but they still exist and can adversely affect the outcome of surgery for an individual.

A metal and plastic knee will never be as good as the original and will rarely be entirely pain-free. A survey from the National Joint Registry, of 10,000 patients more than one year after surgery has shown that 81.2% of patients were satisfied, but the remainder (almost one in five) were in some way disappointed, mainly because of pain. In a multi-national study, patients were asked at one year after

operation whether they would undergo surgery again. In Australia, 25% said that they would not, in the UK the figure was 17% and in the USA 12%. In a small percentage of patients, persistent pain is a problem due to no obvious reason, and this can be difficult to bring under control. These issues highlight the importance of discussing and managing your expectations before the surgery.

In any major surgery to the lower limbs, there is always a risk of venous thrombo-embolism. This occurs when a clot forms in the leg, which may on occasion travel, breaking away from the vein in the leg and ending up in the chest, blocking part of the circulation to a lung. Various measures can be taken to reduce the risk of thrombosis, and at the present time, there is still considerable debate as to the most effective method. NICE guidelines recommend both chemical (i.e. a drug) and mechanical (e.g. a stocking or foot pump) measures. Early mobilisation and adequate hydration are also essential.

Just as fillings work loose in teeth, the implant and cement can work loose in the bone in time. There is no such thing as a mechanical device which is 100% reliable, but as stated earlier this appears to be less of a problem in knee replacement than hip replacement. Well over 90% of knee replacements remain solidly fixed in the bone for at least 10-15 years.

Artificial joints are vulnerable to infection because they have no biological means of fighting bacteria. Infection can cause the artificial joint to loosen by damaging the bond between the implant, cement and bone. It is usually not possible to control infection simply with antibiotics, and the artificial joint may have to be removed. A new joint can be inserted at a later date, but the results are less reliable than with the primary procedure, and there is incidence of continuing infection under these circumstances. Superficial infection in the wound itself is more common, and this will normally respond to local measures. A short course of antibiotics may be required at the discretion of the specialist, but should not usually be recommended by a GP. Most red, inflamed wounds settle with "watchful waiting".

Prevention is better than cure. Patients are screened for MRSA prior to admission, the operation is carried out in a laminar flow (clean air) operating theatre, antibiotics are given at the time of surgery, and the cement that anchors the implant to the bone contains antibiotics. All these measures should reduce the deep infection to a very low level.

The patella is a very important part of the knee joint. If the alignment of the knee is incorrect, then the patella may be unstable, and this can cause a problem. Numbness alongside the scar is normal as the nerves in the skin are inevitably damaged by the incision. Occasionally the main nerve on the outer side of the knee (the lateral popliteal nerve) can be stretched during the surgery. This tends to occur when there has been severe deformity, and the lower leg is pointing outwards (a valgus deformity) and can lead to temporary or permanent numbness and weakness in the foot with a foot drop. The foot cannot be lifted from the ground, and this makes walking difficult. Rarely the main blood vessel in the leg (the popliteal artery) can be damaged, and this is particularly likely to occur if there is pre-existing disease in the artery. A blockage may occur which could cut off the circulation to the leg. Urgent surgery is required to remedy this.

Other general risks of surgery and anaesthesia include heart attack, stroke and chest complications. There are other risks associated with the anaesthetic, which your anaesthetist will explain.

Important Points

- Over 100,000 knee replacements are now carried out annually in the UK.
- The primary indication for surgery is pain due to arthritis.
- Most patients are in hospital for 2-4 days.
- Return to normal day to day activities, including driving, takes about six weeks.
- Full recovery can take up to 12 months.
- A metal and plastic knee will never be as good as the original. Up to one in five patients may be disappointed in some respect.
- The main risks are residual pain, stiffness, blood clots, loosening, infection, kneecap problems and nerve and blood vessel damage. These have to be balanced against the benefits.

Further reading:

[NHS Choices web information on knee replacement surgery](#)

[NRAS article: Knee replacement – a patient's perspective](#)

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