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Partial / Unicompartmental Knee Replacement (UKR)

Patient Information

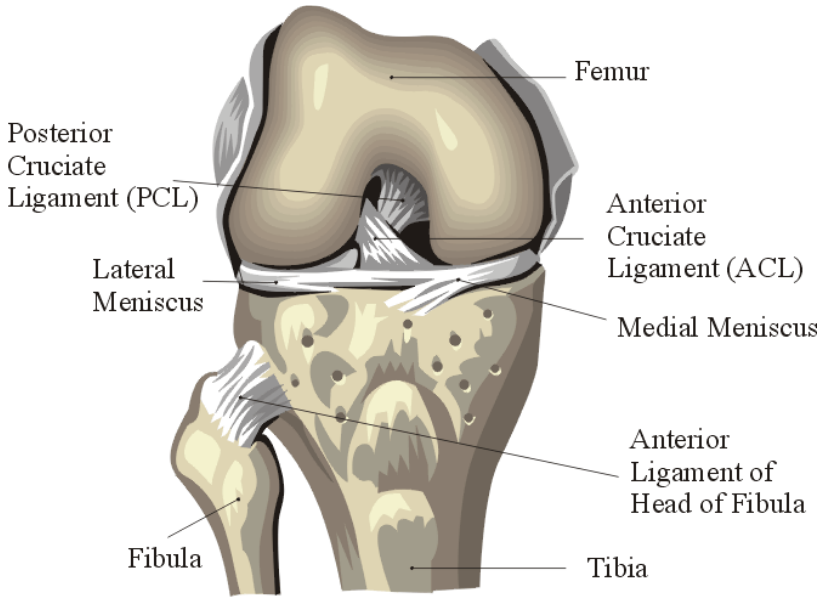
Introduction

This leaflet will hopefully give you a better understanding of partial / unicompartmental knee replacement. Specifically, it includes the reasons for recommending the operation, the benefits of unicompartmental replacement over total replacement, the potential risks involved and what to expect after the operation.

The normal knee

The knee joint is the largest and one of the more complex in the body. It is a major weight bearing joint which allows bending (flexion), straightening (extension) and some rotational movements. The normal knee joint is made stable by the ligaments - collateral ligaments on the sides and cruciate ligaments in the centre – and the thigh and calf muscles. The joint is enclosed by a tough capsule lined by a synovial membrane which produces a lubricating fluid which reduces friction to nearly zero in a healthy knee.

The joint is formed by the lower end of the thigh bone (the femur) and the upper surface of the shin bone (the tibia). A smooth substance - articular cartilage - normally covers the surface of the bones. Osteoarthritis ("arthritis") is the result of this cartilage thinning over time and eventually leaving the underlying bone exposed ("bone on bone"). This 'cartilage thinning' may be accelerated following injuries involving the joint or previous infections. The resulting disturbance of the joint surface causes pain and limitation of movement (stiffness). Either the medial (inner) or lateral (outer) compartment may be affected in isolation, but more commonly, it is the medial side.



Unicompartmental Knee Replacement (UKR)

The knee joint has three 'compartments' – medial (inside), lateral (outside) and patello-femoral (kneecap) – and each can be affected by arthritis. Patients who have significant

arthritis in two or more compartments and who need surgery, will usually require total knee replacement. However, patients who have arthritis predominantly in one compartment of the knee may be candidates for a unicompartmental / partial knee replacement. The operation is primarily recommended for pain relief but in doing so, it often corrects mild deformity and restores good mobility and function.

Right knee x-ray
Normal

Right knee x-ray
Bone-on-bone
arthritis (inner)

Who could have a unicompartmental knee replacement?

This operation usually produces excellent results in patients who:

- Have significant ('bone on bone') joint damage limited to one knee compartment
- Have a stable knee
- Do not have too much deformity and/or stiffness in the knee joint

Advantages of a unicompartmental (v total) knee replacement

- Shorter hospital stay and convalescence
- A smaller incision / scar
- No requirement to divide one/both of the cruciate ligaments, allowing a more normal gait and walking speed
- Better 'patient reported outcome scores' (function)
- Lower risk of major postoperative complications compared to total knee replacement (infection, thrombosis, heart attack and stroke)

Potential disadvantages of UKR

- Over time, osteoarthritis may develop in other compartments of the knee which may require conversion to a total knee replacement (TKR). However, this is uncommon.
- There is a higher (2-3x) failure rate requiring revision surgery - usually to TKR. This especially affects the younger (under 55 years) age group.

Types of Unicompartmental knee replacement (UKR)

A unicompartmental knee replacement will resurface the lower end of your thigh bone and the upper end of the shin bone on either the inside (more typical) or outside of the knee with metal and plastic components. These are secured to the bone using cement.

There are two main types of unicompartmental knee replacement. The first has the metal and plastic components fixed directly to the bone by cement - “fixed bearing”. The second consists of fixed metal components with a mobile plastic ‘bearing’ in between - “mobile bearing”. There has been a significant shift in UK practice over the last 10 years towards using fixed bearing components. This is because the fixed bearing replacement can be used on both sides of the knee and has better long-term results. The mobile bearing implants can occasionally dislocate and cannot be used on the outer compartment.

The Depuy Sigma Partial knee replacement can be used to replace both the inner and outer knee compartments.

The Depuy Sigma partial knee replacement
This is a fixed bearing (no free moving parts) Unicompartmental knee replacement and uses cement (methylmethacrylate) to fix both components to the bone.

Side view Front view

The femoral ‘cap’ and the tibial tray are both made of cobalt chrome and come in a variety of sizes (1-6) to precisely fit the individual. The plastic bearing, which is of variable thickness (7, 8, 9, 10 and 11mm) and clipped into the tibial tray is made of ultra processed polyethylene. Both components are permanently attached to the femur and tibia with bone cement (methylmethacrylate).

Front view

Side view

Right knee with a medial Depuy Sigma unicompartmental replacement

Typical consequences of having UKR surgery ….

- **Post-operative bleeding / bruising**

Due to the nature of the operation some bruising and discomfort of the lower leg is inevitable. A drain may be a source of 'entry' for infection and is therefore not used. You are routinely given medication (Tranexamic acid) at the time of your anaesthetic which reduces the risk of bleeding.

- **Pain**

Some discomfort is to be expected following every type of surgery. You will be given medication to control the pain post operatively and on discharge. Nightpains are common (and a nuisance) for a few weeks following surgery but they settle ….

- **Altered wound healing / sensation**

Most wounds heal very well but some wounds may become red, thickened and painful (keloid) – more common in the Afro-Caribbean race. Damage to the small skin nerves will usually result in some temporary or permanent alteration of sensation, usually on the outer side of the scar on the front of the knee. This might cause an 'odd feeling' when kneeling after the operation.

Risks and potential complications of UKR surgery

Approx. 1-5 in 100 patients

- Infection

You will be given a large dose of antibiotics at the same time as your anaesthetic and the procedure is performed in a clean environment (laminar flow theatre). Despite this, infections occasionally occur. The wound may become red, hot and painful. This usually settles with antibiotics but may require an operation to wash out the joint if there are concerns that the metalwork is involved (deep infection). Very occasionally the metalwork may need to be removed and replaced at a later stage.

- Blood clots (Deep Vein Thrombosis / Pulmonary Embolism)

Following all major lower limb surgery there is a risk of forming a blood clot in the calf (DVT) which can occasionally move through the blood stream to the lungs (pulmonary embolus). You will be treated during the operation and immediately afterwards with mechanical 'pumps' on the foot or calf which help to move the blood through the deeper calf veins. In addition, you will receive blood thinning medication for 10 days post operatively. Early movements and mobilisation are strongly encouraged.

- Knee stiffness

Stiffness may be a problem especially if the movements were significantly restricted pre-operatively. Manipulation (under anaesthetic) may be necessary to improve this.

- Difficulty passing urine (males especially)

If this persists you may be given a catheter until you are more mobile.

Approx. 1-5 in 1000 patients

- Damage to the major nerves around the knee

Very rarely the larger nerves around the knee can be involved resulting in temporary or permanent weakness and/or altered sensation. This may also be caused when 'straightening out' a knock knee deformity for lateral (outer compartment) arthritis due to some increased stretch being applied to the nerve, especially if there has been previous surgery on the outside of the knee.

- Fracture of the bones during the operation

'Senior females' with more porotic (weaker) bones may be more susceptible

- Subsidence of the components post operatively

Very unusual but if the tibial component is not appropriately sized and doesn't sit on the harder rim of tibial bone, this could occur and may require revision surgery

- Damage to the blood vessels behind the knee

This can lead to loss of circulation to the leg and foot. If this happens you will need immediate surgery to restore the blood flow and this could result in amputation.

The operation

This is usually performed under general anaesthesia but on occasion it may be with a local block e.g. spinal anaesthetic. It requires a tight inflatable band (tourniquet) to be applied to the leg to limit bleeding. You will wake with a wool & crepe bandage dressing on the knee.

After your operation

You will be encouraged to stand up and walk later the same day, depending on your pain and recovery from the anaesthetic. You will be able to take weight through the knee when standing and your physiotherapist will help you with this. Due to the discomfort around the knee you will not initially feel strong or have complete control of the muscles and crutches are required for a short period. Your physiotherapist will show you some general bed exercises and you should try to do these exercises hourly. Typically, you will be in hospital for 1-2 days.

When you leave hospital

If you live alone, it is advisable to make arrangements to have someone with you for the first few nights until you are confident to be alone. The pre-admission nurse and physiotherapist will discuss this with you at your pre-admission appointment. Once home, you must continue to exercise as you have been instructed.

Wound
Following your operation, you will have an incision over the front of your knee. This will probably be closed with stitching below the skin. This does not require removal but it is wise to review the wound after 12/14 days. You will have a waterproof dressing on and will be able to shower.

Pain relief
Pain after your operation can be kept to acceptable levels by a variety of medications and techniques. Your anaesthetist will have chosen the most suitable pain relief medication for your needs and will have prescribed these. Your pain level may be acceptable while resting, but may increase when you move, e.g. for physiotherapy so it may be advisable to ask for a “top-up” 10 to 15 minutes before treatment. Ice packs placed on the knee are also beneficial for pain relief and swelling. Your physiotherapist or nurse can help you with this.

Eating and drinking
Following your operation, you may feel nauseous, a common symptom following surgery and a common side effect of pain-relieving drugs. Once you are able to tolerate fluids you will be started on a light diet, increasing to a full diet within 48 hours. If nausea is a continuing problem, there is medication available which can minimise it in most circumstances.

Swelling
It is normal to expect swelling and bruising of your knee and leg/foot following this surgery. This can take several weeks or more to resolve**. If you notice a sudden increase in the swelling with pain and redness of the skin please contact the hospital.**

Driving
Driving is usually allowed after six weeks depending on which leg has been operated on and your consultant's advice. You should contact your insurance company and inform them of your operation and check if you are insured to drive.

Sexual intercourse
Following your operation sexual intercourse can be resumed when comfortable, provided there is no significant pain or advice to the contrary from your consultant.

Follow up
Your consultant or physiotherapist will normally review your progress six weeks after you return home, but should you have any queries, please contact your consultant or the secretary.

Long term care
Health and general fitness are important. We would advise that you try to keep your weight down, thereby reducing the stress on the knee joint.
The risk of infection after your knee replacement is very low. However, as a precaution:

- Notify your G.P. if you get any kind of infection, so that you can receive antibiotics as soon as possible.
- Inform your dentist of your joint replacement. As a precaution he/she may prescribe antibiotics, particularly for when undertaking procedures.

Physiotherapy / Strengthening before & after your operation

Physiotherapy is an essential part of the preparation and recovery process, both to reduce the risk of post-operative complications and to ensure that you attain the best functional result. You must be committed to this in the weeks (and months) following the procedure if you want to do well. Soon after your operation the physiotherapist will advise on some exercises to do whilst you are in bed to help reduce the risk of thrombosis. You will be helped to get out of bed and to start mobilising as soon as able, initially with a walking frame. You will rapidly progress to using crutches and be shown how to negotiate stairs. A booklet of recommended exercises will be provided for you to follow whilst at home. When you are safe on crutches and the physiotherapist and surgeon are happy you can go home.