

Day Case Anterior Cruciate Reconstruction

The anterior cruciate ligament is a structure in the knee joint responsible for allowing the joint to move smoothly whilst pivoting on the knee. This function is essential for twisting and pivoting sports such as football and netball, but can even be a factor in daily activities such as working in a kitchen or building site. Not everyone sustaining the injury requires a reconstruction, a third of people have no symptoms of instability. Some knees are very unstable after cruciate injury; repeatedly give way after only minor twisting causing further damage, and inevitable swelling.

How is the reconstruction done?

The cruciate ligament runs from the front of the tibia to the back of the femur, through the knee joint (see below). The damaged cruciate ligament is removed, and holes drilled in the tibia and femur to allow fixation of the new graft to bone. I usually use the hamstring tendons for the reconstruction to minimize tenderness around the front of the knee. The graft is secured in place with an interference screw in the femur and a screw +/- staple in the tibia. The intention of this construct is to achieve 1700N of strength. This technique requires typically a 5cm scar over the upper part of the tibia (shin bone), and two much smaller cuts at the front of the knee.



Figure 1. An x-ray after a cruciate reconstruction. Typically the screw in the tibia tunnel is at a different angle to femur, some surgeons use an endobutton rather than the femoral screw & an “invisible” tibial screw.

Why day surgery?

Day surgery is reasonable, as the majority of patients do not require injections or nursing care after the first few hours. To be done as day surgery requires:

A short distance to travel home

A recovery friendly house

Assistance - a spouse or parent can provide ice packs, sustenance, drinks

A good pain management plan

Are all cruciate reconstructions the same?

This document discusses isolated cruciate reconstruction with hamstring tendons using day surgery techniques and pain management. You may have friends who have had reconstructions done differently. Some parts of this document may not apply to you if the meniscus (cartilage) requires additional surgery, bracing, and rehabilitation; damage to the joint surface requires chondrocyte grafting; or early arthritis requires a realignment osteotomy.

Are hamstrings the best option?

John Orchard (Sport Medicine Physician) has identified a higher ACL reconstruction failure rate in the AFL in 2014. The cause is unknown – possibly the higher interchange rate. There is a 1% lower re-rupture rate for patella tendon in the Danish ACL registry. In professional sports people, it should be considered. Against this is more pain after the surgery, a 5% incidence of being unable to kneel, and a higher rate of arthritis in the long term. LARS allows a faster return to sport. But, the Australian Knee Society recommends against these where biological reconstruction is possible.

Allograft reconstruction seems to have a higher failure rate in the long term.

When is the surgery performed?

The surgery most often is done after the swelling from the injury has subsided and the range of movement of the knee has been restored. The worst time to do the reconstruction is when the knee is stiff – doing it at this stage is usually associated with a very slow recovery. Except if there is a meniscal tear requiring repair or multiple ligaments involved, the preference is to wait until FULL range of movement and an ability to squat.

What is the process?

Preoperatively

Any other health issues (medications, allergies, previous surgery or anaesthetics) should be discussed with your surgeon. Usually physiotherapy work starts prior to surgery. When your knee is ready, and at a time determined by you and your surgeon, the surgery can be performed. Generally the intention is for the swelling to have gone, the knee to have a full range of movement, and you can do squats.

Have your house ready

Prior to surgery make your house ready to be on crutches.
Remove floor rugs
Widen furniture paths
Have commonly used items easy to reach
Arrange bedding to ease movement
Assistance from family or friend

Fasting

We require you to have an empty stomach at the time of surgery. Assuming the surgery is in the morning, eat and drink nothing from midnight – it is also required the day before surgery you eat moderately and consume not more than a glass of alcohol.

What to bring?

Bring a magazine/book, crutches and organise a driver. The exact time of surgery depends on many factors. You may not be able to put your full weight on

the leg immediately after surgery, and will need the crutches to get out to the waiting car. Obviously you will not be able to drive yourself home.

Anaesthetic

The surgery is **usually** done under a general anaesthetic supplemented by local anaesthetic around the wounds. Alternatively, some anaesthetists add a short acting spinal anaesthetic, or it can even be done purely under a spinal anaesthetic. Sometimes a “nerve block” is placed to reduce post-operative pain.

First days at home

In order for a problem free recovery, we recommend a few tips. The recovery period is every bit as important as the surgery.

Icing the knee

Like sports injuries, “RICE” is a good idea.

Rest

Ice

Compression

Elevation

The value of this is most apparent during the first three days after surgery. On returning home from surgery, we recommend lying down and applying an icepack to the knee for twenty minutes. The ice should be reapplied hourly for the first day, and to a lesser extent during the next two days.

Care of incision

The large bandage is removed after the first day and replaced with Tubigrip. The “Cutifilm” dressing is left intact – it keeps the wound clean and dry. Wounds vary but common signs of healing are:

Warmth

Mild swelling

Slightly pink wound edges

To shower, first remove the bandage or Tubigrip, leaving the Cutifilm intact. After showering, pat the dressing dry and carefully reapply the Tubigrip.

Medications

Follow directions for medications, and call your surgeon if there is a problem. Usually paracetamol and antiinflammatories provide background analgesia. Tramal or Endone is also prescribed to give you a strong painkiller in case the need arises. Eating a well balanced diet & plenty of fruit also helps recovery.

Getting out of a seat

- Preferably use high seats with armrests.
- First, move towards edge of seat
- Use armrests to push up with
- Bear weight on good leg (non operated leg)
- Do not rely on crutches until properly standing

Stairs

If you are to use stairs, you must use the handrail and in the first two weeks, keeping your operated leg straight. Go up stairs leading with good leg (keeping your operated leg straight), and to go down stairs lead with operated leg first, keeping it straight.

Exercises & physiotherapy

- Directed by your surgeon and physiotherapist but initially we aim for:
- Ankle pumps
- Quadriceps / gluteal squeeze for 10 secs
- Straight leg raises

Active assisted knee flexion exercises are started once the bulky bandage is removed, and replaced with Tubigrip.

Most people are off the crutches at 5-7 days. An exercise bike is useful once 90 degrees of knee flexion has been achieved, typically around two weeks to four weeks. Straight line running can recommence at four weeks, and at two months swerving can be added to the running.

Return to work timeframe

To return to a desk job, 12 days is often sufficient, more physical jobs will take 4 weeks. Ladders will take 6 weeks. Driving an automatic vehicle if you had a left knee reconstruction takes 10 days, otherwise 3-6 weeks.

Long term recovery

The full strength of a cruciate reconstruction does not occur until two years. It is close to normal at one year, and "just acceptable" at nine months. Preferentially, twisting, pivoting activities and sports are not to be performed until 12 months from surgery. Exceptional circumstances should be discussed with your surgeon.

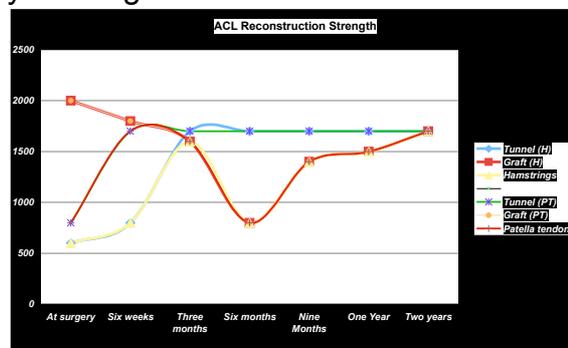


Figure 2. The strength of different parts of the reconstruction using hamstrings. The graft is well fixed at three months, but is weak in its midsubstance between 4 & nine months.

Special surgical cases

Meniscal Repair

The cartilage shock absorbers in the knee have real functions including spreading the load more evenly through the joint surface. If a cartilage is completely removed, arthritis probably will develop eventually, and the knee may never feel quite normal (even though it may feel more stable). If the tear in the cartilage is near the edge and healing capacity, repairing it may be the best plan.

A number of problems occur with repairing the cartilage. It may need protection with a limited range of movement knee brace for up to 3 months, it may require additional incisions to repair, and sometimes it fails to heal. In this last circumstance, a subsequent

operation may be necessary to remove to unhealed portion of the cartilage.

Tibial osteotomy

If the knee has both symptoms of instability and early arthritis (usually medial sided pain and bow-legged deformity), then surgery may include realigning the leg. Although people may return to sport afterwards, this surgery is usually aimed to improve the knee function with day-to-day living. Typically

these patients are on crutches for four weeks.

Chondrocyte grafting

If the knee had a large area of joint surface damage, at the time the cruciate was torn, some cells could be taken and cultured in a laboratory to replace the damaged area. This may require bracing or crutches after the surgery, and additional physiotherapy.

Pain Management after Orthopaedic Surgery

Our intention

Pain management after ACL reconstruction should be sufficient that the surgery feels somewhat like a sporting injury. Our expectation is to have our patients comfortable enough to put weight through the leg, although crutches are usually required for 1-2 weeks, it is better to be able to put the foot down on the floor, and feel able to move the foot up and down.

Local Infiltration Analgesia

During cruciate reconstruction operations, local anaesthetic is infiltrated around the wound by the surgeon. This is mixed with an anti-inflammatory – ketorolac and adrenaline. The injection is placed across the quadriceps muscle, around the nerves of the subsartorial canal, adjacent to the hamstrings before harvesting them, around the wounds and some in the joint. We have worked on this technique for 10 years now.

Pain Patch.

This is only sometimes required for cruciate surgery. Norspan, a narcotic patch, is applied to the skin and gradually releases analgesia. If the patch is too hot, you may become nauseous or drowsy – typically in the shower. Try to keep the patch out of hot water. If your joint is sore you can warm up the patch by giving it a rub, or put on a jumper. The Norspan patch is typically changed 6-7 days after surgery.

Background tablets

Mobic is used twice a day for three weeks. For those that have a history of stomach ulcer, we ask you take an extra anti-ulcer tablet (eg Nexium/Somac) the night before and morning of surgery. Panadol should be used four times a day for the first three days, then as needed, possibly a few weeks.

Pain scores

Nurses in recovery may ask you whether you have any pain, and to score it out of ten. It is important that you tell them if the pain is somewhere different than where the operation was!. If you report 1-3, usually tablets are given, at 5/10 injections of morphine are administered with a risk of causing nausea or vomiting. For comparison – 7/10 has visible signs of pain – teeth clenched, pale appearance, sweaty brow. 10/10 pain is rarely seen and described as “screaming pain”.

Top up medications

Tramal is my preferred drug to top up. Typically the order is 1-2 tablets, 4 hourly as required. Tramal is not always perfect, it can cause nausea or hallucinations, and can't be used with high doses of some anti-depressants. Usually we have had an opportunity of trying them in hospital before you go home.

Swelling control reduces pain

Everyone who has sporting injuries knows Rest, Ice, Compression, and Elevation. **Rest** means not bending it too much in first two days. It is still permissible to walk and exercise your feet up and down. **Ice packs** are first applied in recovery, or as soon as possible after the surgery. Be a little careful with areas that have local anaesthetic that you may not be able to feel how cold it is. Do NOT apply ice directly to the skin, and apply it only 20 minutes at a time. **Compression** is initially a bulky bandage extending to the foot. This stays on for a minimum of one day. It is then replaced with Tubigrip, and a Venosan stocking. **Elevation.** In the first two weeks, put your leg up when you can. Lying on the couch is better than sitting and swelling the knee.

Avoiding nausea and vomiting

Our aim is to have you drinking fluid as soon as possible after the surgery, and start eating food by two hours. We generally try to avoid fruit juices for the first

day as these sweet & acidic drinks can make you vomit. It is easier to control nausea early, rather than allowing to progress to vomiting.

Risks of Surgery

Surgery is not always perfect. It sometimes exchanges one symptom for another!

General Risks

Any surgery represents risks to the body from minor annoyances through to life threatening problems. We continually work to reduce the risks of surgery. It is not possible to list all risks, and if you have a specific concern, you should raise it with your surgeon prior to surgery. As an example - a deep infection would require readmission, multiple operations, antibiotics, lost time from work and probably an imperfect outcome. If you are concerned something is going wrong after the surgery, please contact your surgeon.

Anaesthetic Risks

A sore throat is common, broken teeth are rare, serious drug reactions extremely rare. Bleeding or infection within the spine after a spinal anaesthetic is extremely rare but serious.

Day Surgery Risks

Rarely someone will need re-admission to hospital – this could be for pain control, rarely for bleeding. Typically a hospital with overnight beds is required.

Numbness

An area of numbness beside the scar is normal. Occasionally that area can be large extending down to the ankle if the nerve is in an unusual position.

Stiffness

Sometimes the knee fails to regain a full range of movement – particular getting the knee out straight. It will have been out straight at the time of surgery – this is the position the graft length & tightness is determined. If physiotherapy fails to fix the problem, further surgery will be required.

Locking

A “Cyclops” lesion can also contribute to the knee not fully extending, and can

cause “locking” sensations. This is caused by a ball of scar tissue developing at the front of the knee, or can even be part of the old cruciate ligament. Relatively minor surgery rectifies this.

Instability

Stability is achieved in 95%. Reasons for inadequate stability include: the original injury also damaged structures outside of the joint that contributed to stability; screws could loosen before the graft is fully healed; or further injury during the healing phase may damage the reconstruction.

Failure to return to previous sport

In the AFL the return to previous level of sport is 71%. More patients than this return to sport, but not necessarily to the same level.

Kneeling

Kneeling is a capacity of normal knees in normal people. After knee surgery, even thin people may find it difficult to kneel. The concept of using a hamstring graft is to minimize the kneeling problems seen in patella tendon grafts.

Allograft complications

Instead of using your hamstring tendons, or part of your patella tendon, sometimes surgeons use an “allograft”. This is easy to do – the Victorian Bone Bank is attached to the state Coroner’s office. Put more plainly, it is taken from someone who has died typically from a motor vehicle accident. Specific consent for this is obtained by the surgeon when booking the surgery.

Allografts carry an extremely, and as so far unrealised, risk of undetected infections (eg HIV or hepatitis). The advantage of an allograft is it avoids any graft site morbidity. It is most commonly used if both the anterior and posterior cruciate need reconstruction, but could be considered in elite athletes aiming to use the “window of opportunity” between 12 weeks & 4 months to attend a specific event (eg Alisa Camplin, Winter Olympic, 2006). Note however Michelle Yeoh was back on the set of Crouching Tiger, Hidden Dragon

three weeks after her reconstruction
using patella tendon. Presumably no
kicking at that time!

Financial Consent for ACL Reconstruction

The total cost of a cruciate reconstruction is often in the realm of \$8000, of course the patient barely sees this, as the largest expense is the hospital, and covered by your insurance, perhaps you might have a hospital excess of \$300-\$500. Doctors involved in the operation are: the surgeon, anaesthetist, and surgical assistant. The anaesthetist will get financial consent separately, but assuming you have health insurance, will be in the range of \$0 – 500 out of pocket. The assistant usually will not cause an out of pocket expense, but will be billing usually your insurance company directly. Physiotherapy is not included in these figures.

Included in the surgeon's fee is performing the surgery, follow-up in the hospital and consulting rooms for three months, to take responsibility for the whole process, and to solve whatever problems occur. I take personal responsibility for the post-operative pain control – I usually include extensive local anaesthetic infiltration around the wounds. For patients off track, I intervene, or supervise interventions. I take personal responsibility for achieving a low infection rate. If an infection does occur, I have an aggressive surgical and antibiotic treatment. Were I the patient, I would be happy to pay a premium for these things.

My surgeon's fee in line with the AMA for cruciate reconstruction is \$ 3760 assuming a meniscal repair or some other major surgery is required.

Medicare contributes \$988 for the surgeon. Insurance companies are required to pay a minimum of \$329 towards the operation. If the surgeon discounts from the AMA fee, the insurance company might pay some more, but generally not enough more to make this idea worthwhile. For example - HCF may choose to contribute \$1786. It doesn't cover the full fee. If the patient has ANY out of pocket expense for the surgeon, HCF drop back to paying only \$329, and the patient is \$2442 out of pocket. The normal surgical fee sees HBA patients \$1000 out of pocket, GMHBA \$2178, other INSURED patients \$2442. Hospital, anaesthetist & assistant fees are in addition to this.

Uninsured patients pay the surgeon \$2772, but also need to pay for the hospital, implants, anaesthetist, and assistant surgeon (total cost for patient about \$7,400, more if Fastfix or other complex meniscal repair devices used). Patients are advised against this if in poor health (costs continue to increase with a long hospitalisation and additional doctors) and are unwise to borrow money to pay for surgery.

You will receive from us a written quotation outlining "out of pocket expenses" for your surgeon & assistant. The term "gap cover" is used by insurance companies, however, it only applies if the surgeon heavily discounts his fee. It is recommended that you confirm that your policy covers joint replacement surgery and will cover you in a private hospital.

If you are experiencing personal financial hardship, please discuss this well prior to the surgery so an amicable arrangement can be made. The out of pocket expenses will be required to be paid two weeks prior to surgery to avoid cancellation.

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