Anterior Cruciate Ligament (ACL) Reconstruction

Essential Information

For Patients Undergoing Knee Surgery.

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Arthroscopic Anterior Cruciate Ligament Reconstruction.

You have decided to or are considering undergoing arthroscopic knee surgery. To help you understand what is involved in this type of knee surgery we ask you to carefully read the enclosed information.

The Anterior Cruciate Ligament (ACL)

The anterior cruciate ligament is one of the main stabilising ligaments in the knee joint and is commonly torn following twisting injuries. It is well documented that this injury often leads to progressive knee instability associated with pain, swelling and further damage within the knee.

Some people can change their activities by giving up demanding sport and have very few symptoms from their knee. However others will continue to experience giving way and lack of confidence in their knee. Previously a major operation involving a long incision with prolonged periods of time in plaster was necessary to reconstruct the knee. However this surgery can now be performed arthroscopically with techniques which involves less surgery time and a shorter recovery period.

The Graft.

There are three types of graft available which are used to replace the torn anterior cruciate ligament. The graft can be taken from:

a) The middle third of the patellar tendon

Previously the middle third of the patellar tendon was most commonly used. It had the advantage of strong fixation with bone on bone healing. However for people whose occupations involve kneeling or who have pre-existing problems with their knee caps, this graft may not be appropriate.

b) The hamstring tendon

Using the semitendinosus and gracillis tendons as a double looped graft is now the procedure of choice. This has the advantage of avoiding potential discomfort in the front of the knee and is the procedure of choice for younger patients still growing or where the patellar tendon is inappropriate for use.

The use of the hamstring tendon graft rather than the patellar tendon graft generally avoids the problems of patellar tendonitis and quadriceps wasting which can follow procedures using the patellar tendon graft. It does mean however, there is some weakness of the hamstring for the first three months but this is not a long lasting problem.

a) LARS Graft.

This is a synthetic graft. This graft is sometimes used for people having revision ACL surgery or for personal reasons when a quicker recovery is required.

A synthetic graft eliminates the need to harvest a natural graft and therefore the operation is less invasive, usually resulting in a quicker recovery. The disadvantage of the LARS graft is there is no long term studies of outcomes such as are available with the hamstring and patellofemoral methods. Preliminary studies appear favorable.

Note: Whilst you will be advised which graft will likely be used, the actual decision may not be made conclusively until the knee is surgically assessed at operation.

Deciding to Undergo ACL Reconstruction.

Before consenting to surgery you should be satisfied you understand the reason/s and nature of this procedure and that it is the appropriate treatment in your case. You should take your time to make the decision to proceed with surgery and, if you would feel more confident, seek a second opinion.

As this is elective surgery, it is very important for patients undergoing this operation to understand the reasons for the procedure and to have a major role in making the informed choice to proceed with surgery rather than non-surgical methods of management.

In most cases the decision to proceed with surgery is made because the advantages of surgery outweigh the potential disadvantages.

It is important you have a realistic expectation of your surgical outcome and you should discuss this fully with your surgeon. We encourage our patients to be informed and invite your input so as to promote co-operation and a team approach in working together to restore your knee function to the best possible state.

Preparing For Your Operation

Once you have made the decision to proceed with ACL reconstruction surgery, it is important to understand that a major factor in achieving optimum recovery is to regain your quadriceps (thigh) strength as soon as possible following surgery.

It is beneficial to you if you practice thigh strengthening exercises **PRIOR** to your operation. The quadriceps muscles are found on the front of your thigh and are sometimes called **thigh** muscles. For instructions please see diagrams on the last page of this brochure.

Where reduced fitness and muscle weakness complicates surgical outcome, your surgeon may advise referral to a sports physician or physiotherapist, for a pre operative and/or post operative fitness programme.

Past history of skin infection/s:

If you have had any **history of infection** in you limbs, eg cellulitis or dermatisis, you must tell Dr Rowden before booking surgery, as this may increase your risk of developing post operative infection/s.

You're Hospital Admission - The Booking Process.

Dr Rowden: Surgery performed at St George Private Hospital.
1 South St. Kogarah. NSW 2217. Tel: 02 9598 5555. Fax: 02 9598 5000

Hospital stay for this procedure is usually over night

Our secretary will complete the necessary admission papers at the time the operation is booked and send it to the hospital on your behalf.. You will be provided with a folder containing relevant information for your scheduled surgery.

Getting ready to go to hospital:

It is essential that you are particularly careful with your personal hygiene before admission to hospital. Many infections are endogenous (ie within the body).

It is recommended you shower at least once a day for **five days before surgery including the day of your admission, using TRICLOSAN.** This is an antibacterial soap that can be purchased from your Pharmacy without a prescription. Your hair should also be washed with Triclosan the morning of your admission to hospital.

You should shower using a clean Chux or face washer, enuring you wash your entire body and being careful not to miss awkward areas and crevices such as arm pits and groin.

Fingernails should be clean and devoid of nail polish or acrylic substances if possible.

You should **NOT** shave your knee.

Patients are advised not to take jewellery or valuables to the hospital.

X-rays and scans. Please ensure you take all relevant x-rays/scans to the hospital.

Smoking: You are advised to stop smoking for as long as possible before surgery.

Skin problems:

If you develop any **rash**, **abrasions**, **cuts**, **pimples** or **sores** on the leg you are having surgery upon, please notify our office immediately. This sometimes means the operation will have to be deferred until the area has healed.

Crutches:

Please ensure you take a pair of crutches to hospital on admission. You will usually need them for the first 5-7 days following surgery and can discard them once you can comfortably weight bear.

Medications:

Please take a list of your current medications and known allergies to the hospital on admission for the anaesthetist's records.

Hypertensive (blood pressure) and cardiac (heart) medications should be taken at the usual time with a small sip of water unless you have been advised otherwise by the anaesthetist or cardiac physician.

Aspirin and/or other anticoagulant and anti-inflammatory medications should have been ceased 7 – 14 days before surgery, as specified by you surgeon, unless in specially advised circumstances. Sometimes these medications can be called by generic names, eg. Cartia, Astrix Iscover, Plavix etc, so it is important you are informed by your GP, the type of medication you are taking and for what purpose you are taking it. You are also asked to cease taking fish oil and Glucosamine 7 days before surgery.

Take all your regular medications with you to the hospital. Most other regular medications can be deferred and taken after the surgery, unless advised otherwise by anaesthetist or cardiac physician.

Admission Time:

You will be admitted to the hospital the **day of your surgery.** You are asked to ring Hurstville Knee Clinic on **02 8568 6700** between 9.30am – 11.30am, the working day before your operation and you will be advised what time you are required to arrive at the hospital. You will also be given fasting instructions. (ie. You will be told when you must stop eating and drinking before your surgery).

The Anaesthetic and Surgery.

Your anaesthetist (ie the doctor that gives you the anaesthetic that puts you to sleep during the operation) will usually visit you in hospital before the procedure and you will have the opportunity to discuss the effects, possible complication, and any concerns you may have before proceeding with the procedure.

You should provide the anaesthetist with your list of medications, advise him of any known allergies and discuss any previous anaesthetic problems.

The operation is usually performed under a spinal anaesthetic. This is not to be confused with an epidural anaesthetic which is often used when a woman is having a baby. However you will be fully sedated throughout the procedure. You will be in the Operating Theatre for approximately 60 minutes and kept in the Recovery Ward under observation for a further 2 hours.

You may experience some soreness for which you will be kept comfortable with pain control medication.

NB: If you are concerned about the potential for complications or the advantages and disadvantages of a decision to proceed with surgery, from an anaesthetic view point, you may prefer to discuss your situation with the anaesthetist before admission to hospital.

Dr Rowden's regular anaesthetists are Dr Russell Hancock and Dr John Hamilton. Both anaesthetists are part of the St George Anaesthetic Group. Telephone: 02 9588 1616.

PLEASE NOTE: Although Dr Rowden has regular scheduled anaesthetist/s, occasionally situations may arise that results in another anaesthetist being used without notice.

After Surgery – Before Discharge

- When you awaken you will be in the Recovery Room. Your knee will be bandaged and you may experience some soreness and swelling. You will have an intravenous drip in your arm which will help control pain. You will also be given antibiotics.

- The nursing staff are to regularly apply cold packs to the knee.

- Prior to discharge from hospital, the bandage around the knee will be removed and a dry dressing applied. **This must be kept dry** over the following week until the stitches are removed. If the dressing becomes wet you must replace it with a clean dressing or band-aids.

- It is important for you to commence thigh strengthening exercises immediately following surgery. You can commence these exercises in the Recovery Room. These exercises, if done regularly over the following 10 days, are usually sufficient until your post operative visit at which time your progress will be assessed and supervised physiotherapy will then be recommended. Copies of your operation report can be made available to your physiotherapist and we would ask you to ensure our secretary has the relevant name and contact details.

- Please make sure you have procured the medication for pain control that has been prescribed for you when you leave hospital. Ensure you understand what to take and when to take it. Please make sure you have appropriate prescriptions and an adequate supply. `

- As a precaution to minimize the risks of developing deep venous thrombosis (blood clots) it is recommended you take one tablet of low dose Aspirin once a day for four weeks following surgery. **Cartia** (i.e. Aspirin with a coating to protect the lining of your stomach) can be purchased without a prescription from your chemist.

- **Cartia is not suitable for patients with a history of gastrointestinal problems and should be ceased immediately if you develop any gastrointestinal discomfort.**

At Home Following Surgery: (Surgery telephone no: 02 8568 6700).

- An appointment to see your surgeon about 8 days after surgery, has usually been made for you when your operation was booked. This is usually noted on the inside of your Knee Folder. However if you do not have an appointment, please call the office to organise one.
- You cannot drive a vehicle until you have regained full knee function. Research has shown there is a delayed response time in breaking for 4 – 6 weeks following ACL knee surgery.
- It is recommended you do not travel long distances by car or plane for 2-4 weeks following surgery owing to increased risk of developing DVT's (Blood clots). If circumstances demand you must travel, speak with your surgeon about precautions that can be taken to minimise this risk.

CAUTIONS.

- If you experience swelling and excessive pain and/or calf pain which does not respond to ice, elevation and rest you should contact our office during business hours.
- If you require assistance outside of office hours, please contact St George Private Hospital on 02 598 5555 and speak with the Sister in Charge of the Orthopaedic Ward, or go to your GP or nearest public hospital.

How To Improve Your Recovery Process:

Remember if pain, swelling and thigh weakness persists your recovery will be considerably prolonged. ACL knee reconstruction generally entails a 3-6 months recovery period and a motivated and diligent approach to a rehabilitation programme is important to gain the optimum result. Supervised physiotherapy and hydrotherapy can be most beneficial and your surgeon will advise you when it is appropriate to commence these programmes.

Reduce pain.

It is normal for the knee to be sore and swollen following ACL surgery. Activities should be increased gradually. You should avoid prolonged walking or standing for the first week.

You should avoid trying to bend your leg beyond 90 degrees as this will cause pain and swelling. Most uncontrolled pain is due to excessive swelling.

Within 24 – 48 hours pain should be controlled with Panadol. Excessive pain can be due to spending too much time on your feet before the thigh muscles have been adequately strengthened.

Reduce swelling.

Initially elevation, regular quadriceps contractions, cold packs for 20 minutes every two hours and anti-inflammatory medication (optional) should diminish swelling rapidly. If swelling or fluid in your knee persists it is likely you are spending too much time on your feet. However if swelling does not gradually decrease despite these measures, contact our office.

Thigh Strengthening Exercises.

The thigh strengthening exercises you practiced before your operation should now have been put into action and continued until your muscle strength has returned to normal.

Long Term Knee Care.

Significant knee trauma including damage to the menisci can increase your risk of developing knee osteoarthritis in the long term.

To minimise this risk we recommended long term knee care which should include maintaining good muscle strength, weight control, wearing well cushioned shoes and minimizing where possible, engaging in activities that places frequent stresses on the weight bearing surfaces of the knee/s.

Your Hurstville Knee Clinic Folder.

You will have been given a folder when your operation is booked containing information on the hospital, pre operative instructions and a copy of this brochure. Please keep all relevant information regarding your knee surgery, in the folder.

A questionnaire will be included which you are to complete once you have read and understood this brochure. Please return to our office in the envelope provided. Please feel comfortable in contacting our office if you require further information regarding your operation.

A copy of your operation report and photographs of the inside of your knee can be obtained from our office and kept in the folder. This can then be kept as a record of you knee surgery for future reference.

Expected Operation Fees for Knee Arthroscopy

When you surgery is booked you will be given an estimation of expected fees for the surgery and a questionnaire ensuring you understand the nature of the procedure, limitations and possible complications. Copies are placed in your folder, and one copy is to be signed and returned to our office in an envelope provided, before surgery.

There are 3 main costs for people undergoing surgery in a private hospital.

1) **Hospital.** You are asked to ring St George Hospital, quoting your health fund details and item number of surgery. The hospital can then advise whether you will have any out of pocket expenses.

2) **Anaesthetist**. You may ring the St George Anaesthetics on 02 9588 1616 quoting the item number and date of surgery and you will be advised of the fee and method of payment.

3) **Surgeon and his assistant**. You will be advised of the surgeon and his assistant's fees when you book the surgery. Usually there is a discount opportunity available **provided** a deposit is paid before surgery and the Medicare and health fund cheques are received with 6 weeks of surgery.

Other costs that may be incurred are radiology, pharmaceuticals, physiotherapy, orthotics, pathology etc.

ACL Knee Reconstruction - Item No/s. 49536. 49539. **49542**

The most common number is 49542 although this can sometimes change, according to the operative findings and requirements, some of which are unknown until surgery takes place.

Possible Complications of ACL Knee Surgery.

Most serious risks associated with knee surgery are rare and complications following ACL surgery are uncommon. The surgical technique has been refined to reduce the incidents of problems and complications that were more common in the past. Surgeons who do a lot of these procedures would be expected to have a very low complication rate.

However all surgery carries potential risks and the possibility of complications. Despite the advances in surgical technique and the experience of the surgeon, problems and complications can still occur and **it is our duty to inform you and your right to be made aware** of the possibility of complications. We have therefore outlined some specific complication of ACL knee surgery, some complications of general surgery and anaesthesia. This list of complications is not exhaustive. Rare and unusual problems can occur, although most of these are treatable and do not affect the end result.

Specific complications following arthroscopic ACL reconstruction include the following.

Infection: The infection rate following arthroscopic ACL reconstruction is very low. It is much lower than in most other surgical procedures. Its incidence is less than 1:200 patients. Antibiotics are given at the time of surgery to reduce the risk of infection. The operation is performed in a sterile environment and minimally invasive techniques make infections unlikely. However, despite these precautions infection can still occur. Consequences of infection include joint stiffness, joint surface destruction and graft failure. Treatment involves antibiotics and often further surgery. Chronic bone or distant organ infection is extremely unlikely but remains a possibility.

Joint Stiffness: Scar tissue can form in the knee after surgery. This can limit joint movement. Modern arthroscopic techniques combined with adequate rehabilitation keep this likelihood to a minimum. Treatment depends on the degree of joint stiffness. Sometimes a slight loss of the ability to straighten the knee can be tolerated by the patient.

Treatment for lack of motion can involve physiotherapy which may be extensive and occasionally further surgical procedures to remove the scar tissue. These procedures are not always successful in restoring full motion to the knee.

Bleeding: Bleeding into the knee can occur following surgery despite the routine use of drains. A small amount of bleeding inside the joint after the surgery can be considered normal and needs no treatment. It will resolve in time.

Larger amounts of bleeding can occur in patients who have blood clotting abnormalities or who have been taking Aspirin or anti-inflammatory medications prior to surgery. Patients are therefore advised to avoid Aspirin or anti-inflammatory medication 7 – 14 days prior to surgery, as advised by their surgeon.

You must ensure your surgeon is aware of all medications you are taking or have recently taken, including non prescribed medications, prior to surgery.

Excessive bleeding into the knee can require aspiration of the blood with a needle under local anaesthesia and occasionally an arthroscopy to wash out the knee joint and assess the cause of the bleeding.

Damage to Associated Structures: ACL surgery carries a very small risk of damage to blood vessels and nerves of the leg. Damage to these structures could cause further disability and require further surgery. Nerve damage can cause numbness and weakness in the leg below the knee that may not fully resolve.

Deep Venous Thrombosis: This term refers to the formation of blood clots within the blood vessels. If they form in the veins they are known as deep venous thrombosis (DVT) which can cause swelling and pain in the legs and restriction of blood flow. These clots can travel to the lungs and cause a pulmonary embolus. This complication is more likely to happen in overweight people, women taking oral contraception and smokers. For this reason patients are advised to stop smoking. Long aeroplane flights also increase the chance of blood clots forming and therefore patients should not fly and have surgery in the same two week period.

Regional Pain Syndrome (Reflex Sympathetic Dystrophy): This rare condition is not well understood by the medical profession. It involves over activity of nerves in a limb. It can occur after surgery or after injuries. It can occasionally occur spontaneously. It causes pain, swelling and sweating of the limb. If treated early the end result is much better than if treatment is delayed. It can cause prolonged disability.

Graft Rupture: This complication can occur with further injury to the knee. The incidence of ACL graft rupture is approximately eight percent.

Graft ruptures have been known to occur with less force than would be expected to tear a normal cruciate ligament.

Occasionally the ACL graft can fail for biological reasons and may need to be revised.

Studies would indicate that the graft weakens over a period of time and then stabilises in strength.

Revision procedures for ruptured grafts either use hamstring tendons from the other leg, the central third of the patellar tendon from the same leg or a LARS synthetic graft. Revision procedures have similar success rates as the primary procedure.

Graft Stretching. The ACL graft is at its tightest at the time it is placed into the knee. Some stretching of the graft will inevitably occur.

The final stability of the knee is influenced by the initial degree of instability. Patients who have their operation soon after their injury are much more likely to end up with stable knees in the long term than patients who have had a torn anterior cruciate ligament for years.
Patients with other ligament injuries in association with the anterior cruciate ligament tear may end up with less stable knees.

Problems with internal fixation devices: The ACL graft is securely held in position by a small but very strong titanium Endobutton on the femoral side (above the knee joint) in the femoral tunnel. On the tibial side (below the knee joint) the graft is held either by a plastic screw.

These devices seldom cause problems but screws can occasionally break or cause irritation to the overlying tissues. In some cases it may be necessary to remove the screw. As the graft tendons heal biologically in their bony tunnels, removing the screw after six months should not affect the stability of the graft.

Numbness: Numbness in part of the leg below the knee can occur due to interruption of skin nerves. This is often unavoidable and can be permanent. The numbness often reduces in time. The function of the knee joint is not affected.

Many patients develop a small patch of numbness on the front and side of the leg below the knee. Occasionally a larger area of numbness can occur below the knee. This can be permanent.

Some people can find this sensation irritating but it does not cause any functional disability related to the stability of the knee.

Donor Site Problems: Studies have shown that removal of the two hamstring tendons used to reconstruct the anterior cruciate ligament does not lead to long term loss of hamstring power in most cases. Possible problems from removing the hamstring include excessive bruising in the back of the thigh and calf. This is only temporary and usually resolves within a week or two. Residual hamstring strains can occur during the rehabilitation phase a few weeks after the operation. This causes some pain and swelling in the back of the thigh but usually lasts for a week or so. Rehabilitation is usually delayed by a week or two if this occurs. Adhesions and tethering around the remaining hamstring tendons around the knee can cause slight loss of muscle function. Surgery to release these scar tissue tethers is rarely required. Problems arising after removing the central third of the patellar tendon are more common than with hamstring tendon removal. They include pain around the patella and front of the tibia below the knee. This can cause discomfort with kneeling. For this reason hamstring grafts are usually preferred. If the hamstring tendons are found to be inadequate then it may be necessary to utilise the central third of the patellar tendon to stabilise the knee. The final decision on graft type may therefore be made at the time of operation.

Compartment Syndrome: Excessive swelling in the leg below the knee after surgery may cause pressure on the muscle tissue to build up and cut off effective circulation to the muscles. This is an extremely rare problem but if it occurs it is serious and requires surgical release of the tight fascia surrounding the muscles in the leg. Permanent damage to the muscle and nerves can result if this condition is left untreated.

Poor Results From Surgery: Poor results following ACL knee surgery are usually due to pre-existing damage to the structures within the knee.

Knees with significant articular cartilage damage or arthritis tend to gain poorer results from surgery than patients with an ACL tear in an otherwise normal knee. Arthritic knees can become more painful following surgery although this does not usually last.
If unexpected pain continues following ACL surgery and compliance to appropriate rehabilitation, then further investigation is required, usually with an MRI scan. Occasionally further surgery may be required. However it is important to note that no knee surgery can reverse the arthritic process and cannot repair damage to the articular cartilage.

Summary: Complications following arthroscopic anterior cruciate ligament reconstruction in experienced hands are not common. This list of complications is not exhaustive. Rare and unusual problems can result. Most of these are treatable and do not lead to failure of the operation.

The success rate of this procedure in restoring stability to the knee is around 95%, although there can be some deterioration over time, depending upon the presence of other damage to the joint. Most patients are very happy with the results of this operation.

General Surgical Risks.

The general risks of surgical procedures include the following:

Respiratory tract infections: This includes the development of pneumonia which can follow anaesthesia for surgical procedures. It is more common in the aged and very uncommon in the young and healthy. Treatment involves antibiotics, physiotherapy and respiratory support. Treatment is not always effective.

Thromboembolic problems: This term refers to the formation of blood clots within the blood vessels. If they form in the veins they are known as deep venous thrombosis (DVT) which can cause swelling and pain in the legs and restriction of blood flow. These clots can travel to the lungs and cause a pulmonary embolus. This complication is more likely to happen in overweight people, women taking oral contraception and in smokers. For this reason patients are advised to stop smoking. Long aeroplane flights also increase the chance of blood clots forming and therefore patients should not fly and have surgery in the same two week period.

In emergencies, special precautions are taken. Treatment of this condition usually involves anti-coagulant (medication to prevent the blood from clotting) administered either by intravenous drip and follow up medication or by oral anti-coagulant therapy. Therapy for this condition is not always successful. If clots form in the arterial system then a stroke may occur.

Infection: This can occur following surgery, Operating theatres are designed to minimise the risk of bacterial infections. Surgical procedures are carried out in a sterile manner. In higher risk operations antibiotics are given to decrease the likelihood of infection.

In low risk operations such as arthroscopy, antibiotics are not given because the complication rate from the antibiotic treatment is greater than the potential complication rate from infection.

Despite expert treatment and antibiotic cover infections still occur. These can cause prolonged disability and require treatment with antibiotics and occasionally surgery. Infections can affect the operative site, the lungs and urinary system.

Complications of Anaesthesia:

Anaesthesia itself entails a degree of risk, some of which has been outlined. Rare and unusual problems can occur as a result of surgery and anaesthesia.

Your anaesthetist will visit you in hospital before the procedure and you will have the opportunity to discuss the effects, possible complication, and any concerns you may have concerning your anaesthetic before proceeding with the procedure.

If there is any doubt in your mind concerning the anaesthetic, we would strongly recommend that you seek an independent second opinion.

Exercise Programme

It is recommended you commence thigh strengthening exercises:

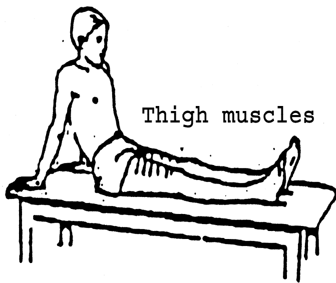
a) Before your surgery

b) In the Recovery Room immediately following surgery.

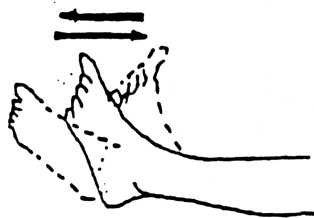
c) For the week following surgery until your post operative visit.

d) Following your post operative assessment – as directed by your surgeon.

Exercises

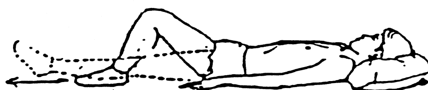


1) With your leg completely straight, contract your thigh muscles strongly and hold for three seconds. Rest for three seconds in between contractions. Repeat the muscle contractions ten times per session. This set of exercises should be undertaken at least ten times per day.



2) From a lying position, move your foot backwards and forwards as far as it will go. Repeat this exercise five times in a session. Do this set of exercises at least ten times per day.

Knee Bending



1) Knee bending and straightening. From a lying position bend your leg to 45 degrees. Repeat this exercise five times in a session. Do this set of exercises at least 10 times per day.

All these exercises should be done gently. Exercise up to the point of mild discomfort is beneficial and it is very unlikely you will harm the knee with any routine post operative exercise programme.