

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

INTRODUCTION

The anterior cruciate ligament (ACL) is one of the major stabilising ligaments in the knee. It is a strong rope like structure located in the centre of the knee running from the femur to the tibia.



Normal ACL

The ligament prevents the femur moving forward and rotating abnormally on the tibia. The ACL is required for normal function of the knee. One of the main functions of the ACL is to provide stability during rotational movements such as turning, twisting and sidestepping.

When it ruptures it does not heal itself and the knee often becomes unstable or gives way. Repeated giving way can lead to damage to other structures of the knee and eventually arthritis. Since the knee ‘dislocates’ when the ligament ruptures there is often damage to other structures in the knee such as bone, cartilage or meniscus. These injuries may also need to be addressed at the time of surgery.

HISTORY OF INJURY

Usually there is a significant injury involving a twisting force to the knee. It can also occur after landing from a jump, stopping rapidly or direct contact such as in a tackle. It is particularly common in sports such as football, soccer, basketball, netball and skiing but can occur in many other activities.

When the ACL ruptures the patient often feels something giving way in the knee or hear a popping sound. Most people cannot continue with their activity and the knee generally swells up within hours.

INITIAL MANAGEMENT

The knee should be treated with ice, elevation and a compressive bandage. Crutches and analgesics usually are required. Physiotherapy is helpful to reduce swelling and regain motion.

Most patients will be referred to an orthopaedic surgeon for diagnosis and assessment of the injury. Careful clinical examination is required to detect damage to the ACL, other ligaments and structures in the knee such as the meniscus or articular cartilage. It is quite common to damage some of these other structures

DIAGNOSIS

This can usually be made on history and clinical examination. An MRI scan which is a special imaging test is often ordered to confirm the diagnosis in patients where the examination is not conclusive. It also demonstrates damage to other structures such as the menisci or articular cartilage. The diagnosis can also be made with an arthroscopy.



MRI scan normal Cruciate Ligament



Ruptured Cruciate Ligament

TREATMENT RECOMMENDATIONS

Most patients who tear their ACL during sport will elect to have it surgically reconstructed, to enable them to return to full activities with a stable knee. Other patients choose to modify their activities and give up sport to avoid further episodes of instability.

In general the younger and more active you are then the stronger the recommendation for reconstruction. It is generally recommended to have surgery if you wish to get back to sports which involve twisting and pivoting.

Repeated instability or abnormal movement in the knee can cause ongoing damage leading to stretching of other structures around the knee, meniscal tears or arthritis in the long term. If you do not elect to have surgery it is strongly advised that you give up sports that involve pivoting, sidestepping or rotation.



Typical Setup for arthroscopic surgery

It is also recommend to have surgery in people with dangerous occupations eg; policemen, firemen, roof tilers and scaffolders. This is a safety issue to prevent instability in at risk situations.

There is no urgency in performing this operation and in fact it is sometimes better to allow the knee to settle down and regain a near full range of motion prior to surgery.

PREOP INSTRUCTIONS

- Cease aspirin and anti-inflammatory medications (eg voltaren, feldene) 10 days prior to surgery as they can cause bleeding.
- Cease any naturopathic or herbal medications 10 days before surgery as these can also cause bleeding.
- Continue with all other medications unless otherwise specified.
- Notify Dr Bruce if you have any abrasions or pimples around the knee.
- Please bring any X-rays, MRI scans or other investigations you have had done which may be relevant to your surgery.
- Bring a list of medications with you to give to the anaesthetist.

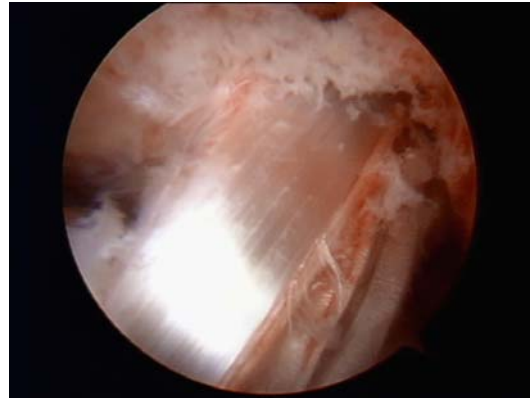
You are advised to stop smoking for as long as possible prior to surgery.

SURGERY

The operation involves replacing the torn cruciate ligament with either the hamstring tendons or patella tendon from the same leg. There is a lot of debate within orthopaedic literature as to which is the best. Dr Bruce uses hamstring tendons unless otherwise indicated.



Insertion of the graft



Graft in place

The hamstring tendons are harvested through a small incision just below the knee and are fashioned into a new graft which takes the place of your old cruciate ligament. Tunnels (holes) are then drilled in the tibia and femur (the two bones making up the knee joint) and the graft is passed through this tunnel. The graft is then fixed with various devices at each end to stabilise it and allow it to heal to the bone. The fixation devices vary and are surgeon specific.

This surgery is all done through the arthroscope using two small incisions approximately 1cm each. The inside of the knee is thoroughly visualised and any other problems such as meniscal tears or damage to the articular cartilage are treated at the same time.

AFTER SURGERY

During surgery the knee is infiltrated with local anaesthetic so you will hopefully not have too much pain. There will be analgesic medication prescribed for you both for use in hospital and at home. There will be a drain in your knee which is removed prior to discharge. You will have a dressing on your wound and a compressive wrap.

Most patients go home the day following surgery but some may go home the same day.

You will be seen by a physiotherapist prior to discharge who will teach you how to use crutches and show you some simple exercises to do at home. Your dressing should be left until your first postoperative visit.

For the first 3 days ice packs should be used to reduce swelling 20 minutes at a time every 2 hours if possible while awake. Your graft is strong enough to put all your weight through it .You can walk around but rest as much as possible for the first week and elevate your leg when sitting. Most patients require crutches for a week or so. Pain is variable and prescription pain killers may be required for a week or two.

You may shower but not bath or swim prior to your review. It is normal to have blood under the dressing. If there is excessive ooze these can be changed using antiseptic. If concerned please contact the rooms or see your local doctor.

You will be followed up in the rooms 7-10 days following surgery where the dressings will be removed and the wounds inspected. The surgery and any other findings will be explained to you.

If there is any redness, increased swelling or you have temperatures you should contact the rooms or the hospital where the surgery was performed so they can contact me. If you are very sick go to the nearest hospital.

Time off work depends on your work requirements and is very variable. Office workers usually require 2 weeks off work and manual labourers 2 to 3 months or longer.

REHABILITATION

Physiotherapy is an integral part of the treatment and is recommended to start as early as possible. Preoperative physiotherapy is helpful to better prepare the knee for surgery. The early aim is to regain range of motion, reduce swelling and achieve full weight bearing.

The remaining rehabilitation will be supervised by a physiotherapist and will involve activities such as exercise bike riding, swimming, proprioceptive exercises and muscle strengthening. Cycling can begin at 4 weeks, jogging can generally begin at around 3 months. The graft is strong enough to allow sport at around 6 months however other factors come into play such as confidence, fitness and adequate fitness and training.

Professional sportsmen often return at 6 months but recreational athletes may take 10 -12 months depending on motivation and time put into rehabilitation.

The rehabilitation and overall success of the procedure can be affected by associated injuries to the knee such as damage to meniscus, articular cartilage or other ligaments.

For more detail especially for your physiotherapist see ACL rehabilitation handout.

COMPLICATIONS

Complications in arthroscopic anterior cruciate ligament reconstruction are not common. Despite advances in surgical technique and the upmost care being taken in surgery complications however can still occur. It is very important for patients undergoing this operation to understand the reasons for the procedure and to have a major role in making an informed choice to proceed with surgery rather than non operative treatment.

SPECIFIC SURGICAL COMPLICATIONS

The following is a list of the possible well described complications. Other more rare complications are also possible. Most of these complications are treatable and do not lead to long term problems.

Excessive swelling and bruising of the leg - This is due to bleeding in the joint and surrounding tissues. It can cause short term pain and make it difficult to bend the knee. To avoid this, ice the leg and elevate it as much as possible.

Infection - This occurs in approximately 1 in 200 cases. The procedure is done using antibiotic prophylaxis and in a sterile operating environment to reduce the risk of infection. Treatment involves either oral or intravenous antibiotics and may involve further operations to wash out the joint. Occasionally this can lead to joint stiffness, destruction of the cartilage within the joint or failure of the graft.

Joint stiffness - can result from scar tissue within the joint resulting in loss of motion. Modern minimally invasive techniques and rapid rehabilitation makes this less likely than in the past. Treatment consists of physiotherapy or occasionally further surgical procedures. Full range of motion can not always be guaranteed.

Bleeding - Small amounts of bleeding in the joint are normal. Large amounts of bleeding can occur but are more common in patients with bleeding disorders or those taking antiinflammatory medications. These should be ceased 2 weeks prior to surgery. Excessive bleeding can require aspiration of the knee or occasionally a repeat arthroscopy.

Graft rupture or stretching - This can occur with future injuries. Graft failure is approximately 5% which is about the same risk as rupturing the good cruciate ligament on the other side. If this occurs the graft can be redone using the tendons from the other leg. The postoperative course for a revision is only slightly slower than normal and the complications much the same.

The graft can also stretch over time. The graft is tightest at the time of insertion. This is more likely in patients with ligamentous laxity or in patients with damage to other ligaments of the knee. Patients who have their operation soon after their injury are more likely to have a more stable knee in the long term before other structures in the knee

stretch out. If it does stretch in some cases a brace can assist with return to sport and in other cases it is in the best interest of your knee to give up sport.

Damage to nerves or vessels - There are small nerves under the skin which cannot be avoided and cutting them can lead to areas of numbness in the skin below the knee. There can also be areas of tingling or hypersensitivity around the scars. Any numbness generally reduces in size with time and doesn't cause any functional disability. Occasionally damage to more important structures can occur especially with meniscal suturing. This can lead to more significant areas of numbness and muscle weakness below the knee.

Hardware problems - the graft is fixed into place with various devices into the bone. These vary from metal or absorbable posts, screws, buttons and staples. These devices can occasionally cause irritation to surrounding structures and require removal. They are only removed once the tendon has grown into the bone and they are no longer required to hold the graft in place.

Donor site problems - The choices of graft include hamstrings and middle third patella tendon. Following hamstring harvest you can get some pain and swelling in the region of the hamstrings at the back of the thigh but this is usually temporary. Weakness in the hamstrings if it occurs is usually minimal.

The biggest problem following middle third patella tendon harvest is anterior knee pain which can cause discomfort with every day activities especially kneeling. Occasionally the hamstring tendons are not satisfactory and either the hamstrings of the opposite leg or the patella tendon needs to be used, this is an intraoperative decision.

Anterior knee pain - Some patients develop pain around the kneecap .This is a result of muscle wasting and inactivity following surgery and usually resolves over time with appropriate physiotherapy.

Reflex sympathetic dystrophy - This is a rare condition, the mechanism of which is not fully understood. It involves an overactivity of the nerves in the leg causing unexplained and excessive pain.

Deep Venous Thrombosis - clots in the leg which may require medical management in the form of injections or tablets to thin the blood .Very rarely these can travel to the lungs(pulmonary embolus) causing respiratory difficulties or even death.

Compartment syndrome - an extremely rare condition which is due to excessive swelling in the knee cutting off the circulation to the muscles. This requires a fasciotomy operation to relieve this pressure.

Ongoing Pain - This can be unpredictable but is more common in knees with damage to other structures such as menisci or articular cartilage. Arthroscopy cannot reverse any

damage to the articular surface (arthritis).If unexplained pain does occur then another arthroscopy may occasionally be recommended.

Limp - You may continue to limp after the surgery.

Scaring - Unsightly scar or wound breakdown.

CONCLUSION

With specialised surgeons who are performing a lot of these operations results are very successful, in the order of 95%. Complications are rare but still can occur. This is an elective procedure and as the patient you need to make an informed decision on whether or not to proceed with surgery. Hopefully by reading the above you are more informed and are aware of the risks and benefits of surgery. Please feel free to ask any further questions at any stage.