

## **ACL INJURY & TREATMENT**

### Patient Information

#### **What is the Anterior Cruciate Ligament?**

The anterior cruciate ligament is one of the main stabilising ligaments of the knee. It runs through the centre of the knee and links the femur (thigh bone) to the tibia (shin bone). It helps stabilise the knee particularly with rotation, side-stepping and pivoting movements. It is the main stabiliser preventing the tibia from sliding forward on the femur and also helps prevent abnormal rotational movements.

#### **How does the ACL tear?**

ACL tears are common and are seen in athletes of all ages and all skill levels.

The majority are non-contact injuries and typically occur when the athlete is twisting, turning or side-stepping with the foot firmly on the ground, especially during football or rugby, or with a poor landing from a jump as in netball and basketball. Skiing injuries occur when the binding fails to release as the ski twists the leg.

#### **What are the symptoms of an ACL injury?**

At the initial injury, you may hear and feel a distinctive 'pop' accompanied by pain and swelling within the hour.

You may also experience instability of the knee with a feeling that it will 'give way' particularly when returning to pivoting or twisting activities.

A significant proportion of ACL injuries occur in combination with an additional injury such as a meniscus tear, articular cartilage injury or other ligament injury. Repeated giving way episodes can also lead to secondary damage to the menisci or articular cartilage.

#### **Why did my ACL tear?**

The ACL usually tears because your knee has been placed in a position where it is biomechanically not able to withstand the forces placed upon it. This can be due to muscle fatigue, poor biomechanics or a lack of proprioception. (Proprioception is the

sensory feedback mechanism which tells your brain what position you are in and what forces are acting on your body.)

In high level athletes, the margin of error that results in ACL injury can be minimal. If you are deconditioned or have poor mechanics, ACL injuries can occur more easily.

### **How is an ACL rupture diagnosed?**

A detailed evaluation of the knee is performed through a series of clinical tests supported by x-rays and a MRI scan. The MRI will also determine if there are any other associated injuries especially as these can affect treatment.

### **Will an ACL rupture heal?**

An ACL tear does not heal because the ligament does not have a good blood supply. Furthermore, the knee joint lining produces enzymes that means blood clots almost never form within the knee and this also means the ACL does not have a good chance to heal.

### **What is the treatment of an ACL tear?**

The principal objective of treatment is to return you to your desired level of activity without risk of additional injury or damage to your knee.

A well-supervised physiotherapy programme is essential for both conservative (non-operative treatment) and surgical treatment.

If you have a ruptured ACL, but have no 'giving way' symptoms and are content with activities that require no significant side-stepping (such as cycling, swimming or running in a straight line) you may opt for conservative treatment.

If you have symptomatic instability and wish to return to competitive pivoting sports or have an occupation that demands a stable knee, you may wish to consider surgery.

If you have a repairable meniscal tear at the time of your ACL tear, we may recommend surgery to prevent the tear from becoming non-repairable.

Surgery is usually not urgent and is best carried out on a pain free joint with a full range of motion and after a detailed individualised discussion of risks and benefits.

### **What is conservative treatment for ACL injury?**

Conservative treatment (non-operative) is by physiotherapy that is aimed at restoring full range of movement, muscle strength and proprioceptive training to ensure that protective reflexes are optimised to prevent further injury. You may have to alter your sports to non-competitive ones that involve straight line activities only.

Conservative treatment will require physiotherapy-led rehabilitation over many months.

### **What does surgery for ACL reconstruction involve?**

The arthroscopic ('keyhole') surgery to reconstruct the ACL requires replacing it with a graft. The graft is usually a strong tendon from around the knee. Our usual technique involves grafting the torn ACL with hamstring tendons taken through a small incision at the front of your knee.

Other graft options include bone-patella tendon-bone (BPTB), quadriceps tendon or allograft (sterilised donor tendon). The graft choices will be discussed with you.

The graft is inserted into bone tunnels drilled into the femur and tibia at the normal attachment sites of the native ACL, and secured usually with a tiny titanium button on the femur side and a small screw inside the bone on the tibia side. Other methods for securing the graft may be used.

### **What are the risks and potential complications of ACL reconstruction surgery?**

The risks and complications of surgery include, but are not limited to:

- 1) **Anaesthetic risks** - Your anaesthetist will discuss the type of anaesthetic and risks with you.
- 2) **Scars** - You will have a scar secondary to the graft harvest incision and 'keyhole' scars at the knee. Usually, these heal without problems although delayed or abnormal healing can rarely occur. Your outer bandage can usually be removed the morning after surgery but, unless otherwise instructed, you should leave your other dressings intact until your first clinic follow-up appointment (usually around 12-14 days).
- 3) **Infection** - The infection risk is generally in the region of 1% or less. You will routinely be administered intravenous antibiotics immediately before the procedure to reduce the risk of infection.

- 4) Nerve or blood vessel injury
- 5) Numbness -This is common (see below).
- 6) **Blood clots (Venous thromboembolism)** - The literature suggest that the incidence of deep vein thrombosis (DVT) in patients who did not receive post-operative pharmacological anticoagulation may be as high as 8-10% (2-6% symptomatic DVT) while the rate of pulmonary embolism (blood clot in the lung, PE) is 0.1-0.2%. If you have risk factors such a previous history of blood clots, family history, smoking, high BMI or undergo a long operative procedure, we will probably recommend cover to reduce the risk (usually a heparin injection in the post-operative period).
- 7) **Stiffness and loss of range of movement** - Pre-operative physiotherapy is generally employed to regain range of movement pre-surgery. Post-surgery, you will see a physiotherapist to commence your rehabilitation programme. You will have instructions regarding the use of ice or a cryotherapy cuff to manage swelling and guidance on regaining full range of movement, especially full extension ideally within 7 days. Arthrofibrosis is an inflammatory response which results in knee scarring and restricted motion which can occur after surgery, trauma or immobilisation.
- 8) **Bleeding** - Bleeding can result in haemarthrosis (blood in the joint) and swelling. Bruising is common, especially at the posterior thigh when hamstring tendons have been harvested.
- 9) **Swelling** - Some swelling is to be expected. Your outer bandage should be removed on the morning after surgery and you should use ice packs or cryotherapy with a knee sleeve or compression wrap. This will also aid pain control and post-operative rehabilitation.
- 10) **Strength deficits** - These are common following ACL reconstruction and the rehabilitation programme will focus on regaining strength. This includes quadriceps strength deficits and knee flexor deficits following hamstring tendon harvest.
- 11) **Failure of adequate graft harvest** - Rarely, hamstring tendons may be of very small diameter or small length, or there may be difficulty harvesting adequate tendon. You may be asked whether you would consent to contra-lateral (opposite) leg tendon harvest in such a scenario.
- 12) **Medial collateral ligament injury**
- 13) **Re-rupture** - approximately 5-6%

- 14) Failure of the procedure or to provide enough stability
- 15) Problems secondary to implants/fixation devices
- 16) Fracture
- 17) Difficulty kneeling - After any operation on the front of the knee it can take a while to tolerate kneeling. Difficulty kneeling and discomfort at the front of the knee is greater with bone-patella tendon-bone graft harvest (BPTB).
- 18) Bone-patella tendon-bone autograft related - Donor site morbidity is generally higher for BPTB grafts – such as anterior knee pain, patella fracture, patella tendon rupture and post-operative osteoarthritis.
- 19) Damage or numbness to the skin under the tourniquet
- 20) Compartment syndrome - This is a very rare complication of surgery, where a build-up of pressure within the leg could result in nerve, blood vessel or muscle damage.

**I have a meniscus tear- will this be repaired at the same time as ACL reconstruction?**

If you have a repairable meniscal tear, then it is best to perform the meniscus repair concurrently with the ACL reconstruction. ACL reconstruction will make the knee more stable and drilling bone tunnels introduces growth factors into the knee which will enhance the chance of meniscus healing. There remains a risk that a meniscal tear may not heal despite a repair, but we would generally aim to preserve the meniscus where possible. The post-operative ACL rehabilitation protocol may be modified if a repair is performed.

**Will any other procedures need to be performed at the same time as the ACL reconstruction?**

Your pre-operative MRI scan will usually identify any other associated injuries such as meniscal tears, articular cartilage injuries or other ligament injuries that may need surgical intervention concurrently with the ACL reconstruction. These additional procedures will be discussed with you and we may need to modify the post-operative ACL rehabilitation protocol. Sometimes, meniscal tears or articular cartilage injuries are noted only at arthroscopy.

### **What is a Lateral Tenodesis Augmentation?**

In a small percentage of patients with abnormally high laxity or those deemed at high risk of re-rupture, an extra procedure termed a lateral tenodesis may be performed. This requires an additional scar on the outside of the knee and a strip of the iliotibial band (a thick band of fascia) is re-routed into the femur to better control abnormal rotational movements. This will be discussed with you before surgery if it is felt it might be needed.

### **Why do I have numbness after an ACL reconstruction?**

Numbness after an ACL reconstruction is very common. Branches of the saphenous nerve, especially the infra-patellar branch, cross from the inside to the outer side of the knee and can be injured by incisions such as that used for hamstring tendon harvest. Some residual areas of numbness can be permanent, but it does not affect function of the leg.

### **Why can't I straighten my knee fully after an ACL reconstruction?**

During the operation, we will have checked that the reconstructed ligament does not cause a physical block to the knee straightening fully. However, there are sometimes reasons why you might struggle regaining full extension such as difficulty with rehabilitation or ACL graft hypertrophy over time. The latter can result in a 'cyclops lesion', which can be a ball of tissue that prevents full extension. If therapy fails to resolve straightening the knee fully, then obtaining an MRI to look for a cyclops lesion and arthroscopic surgery may be indicated.

### **Can the ACL tear be repaired?**

Sometimes the ACL is torn with a piece of bone that has avulsed usually off the tibia. If there is not a significant intra-substance stretch of the ligament, then the bone fragment can be re-fixed to its normal site.

When there is no bony avulsion, previous attempts to repair an ACL tear with sutures have not shown good outcomes in the literature. Research is currently ongoing to improve outcomes in repair techniques but more evidence is required.

### **Is an ACL reconstruction performed as a day surgery?**

The majority of ACL reconstructions are performed as day surgery. However, depending on whether other surgery is performed at the same time such as complex meniscal surgery or other ligament surgery concurrently, you may have to stay overnight.

### **Does ACL reconstruction reduce the incidence of future osteoarthritis?**

There is no hard evidence that that surgical reconstruction reduces the incidence or progression of knee degeneration (osteoarthritis). However, early knee stabilisation reduces the chance for further damage to the knee including the meniscal cartilages. We know that with the presence of a meniscal tear there is a much higher chance of developing osteoarthritis.

### **Will I need physiotherapy if I'm having surgical treatment?**

There is evidence that pre-operative physiotherapy is effective for improving the outcomes of treatment following ACL injury. ACL reconstruction should wait until the knee has recovered from the acute injury. Restoring knee function pre-surgery will result in faster recovery post-surgery.

Post-surgery, a physiotherapy-led rehabilitation process should commence immediately and continue for 9-12 months post-surgery, progress depending on achieving certain functional goals.

### **When can I walk after an ACL reconstruction?**

If there has been no other concomitant surgery, such as meniscal or cartilage surgery, that necessitates a modified post-operative protocol, you are generally allowed to weight-bear as comfortable after surgery. Usually, no brace is needed and you can wean off crutches when you can walk safely without a limp.

### **When can I drive after an ACL reconstruction?**

If your left knee has been operated on, driving an automatic car may be possible as soon as pain allows – usually around 2 weeks. Otherwise, driving should be possible after approximately 6 weeks.

### **When can I return to work after an ACL reconstruction?**

Return to work is an individualised decision. If you have a very sedentary desk-based job, you may be able to return to work at 2-3 weeks. If your job involves light physical work, the time off will be in the region of 6 weeks. However, if you have a more demanding physical job, you may require 3 months off work.

### **When can I return to sports?**

Return to play is the ultimate goal of rehabilitation programmes, but timing is dependent on many factors such as the specific sport, age, severity of injury, and progress with rehabilitation. Some sport specific training may be possible at 4-6 months. Normally, we would not recommend return to competitive sports before 9-12 months.

There is evidence that return to sport, especially competitive team ball sports, within 12 months increases the risk of repeat ACL injury.

The return to sports rates following an ACL reconstruction have been reported to range between 63 and 65% returning to pre-injury level of activity with 44-54% returning to competition.

### **What is the risk of sustaining a re-injury on the same or opposite side?**

There are multiple mechanisms for a re-injury. The highest risk has been reported within the first 7 months of return to sport with younger age (less than 25 years) and return to high level of activity (cutting/pivoting sports) associated with an increased risk of secondary injury.

The literature has reported in the region of 5.8% graft failure on the operated side, with an injury rate of 11.8% in the contralateral (opposite) side. The increased frequency of ACL tears on the opposite side may be due to asymmetrical loading placing the opposite extremity at risk.

**Important:** This information is only a guide to help you understand your injury, treatment and what to expect. Please contact the Chiltern Knee Clinic for advice if you have any concerns about your injury or recovery.