ANTERIOR CRUCIATE LIGAMENT INJURY (ACL)

Introduction

Injury to the cruciate ligaments is a common but severe injury to the knee. The knee joint is the largest joint in the body. It is a ‘hinge’ joint that allows the knee to flex and extend. Additionally, it has the ability to rotate and glide. The knee joint is formed by the tibia (shinbone), the femur (thighbone) and the patella (kneecap). Ligaments connect the bones of the joint for stability and allow controlled movement. Ligaments on the inner and outer side of the knee (collateral ligaments) prevent the knee from bending inwards or outwards. Ligaments in the centre of the knee, called the cruciates, prevent excessive rotation of the knee. Typically the anterior cruciate ligament is torn when a severe injury occurs to the knee involving excessive twisting which ruptures part or all of the ligament.

Injury to the anterior cruciate ligament results in increased forward movement and rotation of the tibia relative to the femur bone. This results in a feeling of instability and excessive movement of the knee. These symptoms are more pronounced with rotation caused by sudden changes in direction and twisting movements rather than with walking and running. Injury to the ACL is frequently associated with other injuries to the knee such as damage to the meniscal cartilages (shock absorbers of the knee), the bearing surface of the knee, and other ligaments of the knee. Typically, an injury to the anterior cruciate ligament results in significant bleeding into the knee. The knee is frequently very swollen with blood under pressure inside the knee resulting in marked pain, stiffness and immobility.

Treatment of an Anterior Cruciate Injury

Initially the knee is very painful, swollen and often you will be unable to walk without the use of crutches or support. An immediate assessment of the knee will be required to ensure that there has been no major fracture of the knee and x-rays will be taken. It will be necessary to have your knee examined by a physician or surgeon experienced in knee injuries to assess the extent of ligament damage.

Because of the high association with other injuries to the knee, it may be necessary to perform further investigations such as arthroscopy or MRI imaging. Frequently injury to other structures such as the cartilages will dictate the need for early surgical treatment.

The longer term management of an injury to the cruciate ligaments depends upon the extent of damage to the cruciate, associated injuries to the knee and the future demands upon the knee. Occasionally, the cruciate ligament is only partially stretched or torn and long term instability may not become a problem.

More frequently however, a complete tear of the ligament occurs and some instability of the knee ensues. If other damage to the knee requires repair of associated ligaments or cartilages, then it will be necessary to perform a knee reconstruction. For the majority of patients the decision to consider surgical reconstruction of the torn ligament depends upon the demands placed upon the knee. For sedentary patients and those with relatively stable knees, a physiotherapy program aimed to strengthen the muscles about the knee is sufficient and surgery can be avoided. For patients with very unstable knees (determined by the knee examination and the frequency of the giving way of the knee), knee reconstruction may be offered. Some sporting activities such as football and netball, among others require a lot of jumping, pivoting, twisting and turning and these activities are often very difficult without a normal anterior cruciate ligament.
Physiotherapy

As the main function of the Anterior Cruciate Ligament ("ACL") is to prevent excessive movement of the knee, it is possible to reduce some of this excessive movement by strengthening the muscles about the knee that help control and stabilise the knee. The hamstring muscles prevent excessive forward movement of the tibia and they compensate, in part, for a damaged cruciate ligament. Your physiotherapist can supervise and advise on a programme to rehabilitate and strengthen the hamstring muscle group.

If reconstruction of the ACL is required, physiotherapy supervision of your rehabilitation programme is mandatory. Initially, it will be necessary to regain the movement that was lost in the initial injury and again temporarily after the surgery. Once the acute symptoms have settled a strengthening program to rehabilitate the hamstrings and quadriceps muscles will be required.

Anterior Cruciate Ligament Reconstruction

Anterior Cruciate Ligament Reconstruction surgery is a replacement of the torn ligaments. This ligament has no potential for healing when significantly damaged and therefore it must be replaced by a new ligament (ligament graft). The surgery involves an inspection of the inside of the knee and treatment to any associated damaged structures by an arthroscopy. The damaged ends of the ligament are removed. Anchorage points in the tibia bone and femur bone are made at the precise location of the original ligament. A new ligament is obtained from a remote site, usually by removal of one of the hamstring tendons or part of the patella ligament. The new ligament is anchored to the femur and tibia bone with a secure fixation device. More recently synthetic (LARS) ligament grafts have become available and may be used instead of your own tissue to reconstruct the ACL.

Following the surgery an accelerated rehabilitation program commences. Afterwards, the knee is swollen for approximately a month. Full weight bearing is allowed and crutches may be required for the first couple of days following the operation. You will require a physiotherapist to supervise your rehabilitation. Initially, range of movement exercises are encouraged to regain the motion that is lost due to the knee swelling. As the knee swelling settles and the range of movement increases, muscle strengthening exercises are sequentially introduced.

It is necessary to avoid stretching the graft until it is firmly attached to the bone at approximately 3 months and certainly for the first 6 weeks. Whilst the graft is firmly attached to the bone at approx 3 months from surgery, the muscle strength of the knee is decreased for 9 to 12 months and competitive sporting activities are forbidden during this time. Your surgeon and physiotherapist will sequentially introduce increasingly demanding knee exercises and activities as your comfort and knee strength permit.
What to Expect After Surgery

Most patients recover well from Anterior Cruciate Reconstruction. Many feel the knee has returned to normal. Most patients have a small area of numbness on the outside of the knee and occasionally the scar of the knee, particularly when placed in the front of the knee, can be tender with squatting and kneeling. Because of associated injuries to the knee, a number of patients will not return to their former competitive level of sports. Most studies indicate that 80% of patients return to a similar level of sporting activity. Your Cruciate Reconstruction restores the strength of the knee to near normal but many patients favour the knee slightly. There is a small nerve in the ACL which cannot be replaced, loss of this nerve perhaps contributes to a subtle loss of agility.

Depending upon the physical demands of your job, work may be resumed at 2 weeks following surgery for office workers, 6 weeks for light manual work and 3 months for heavy manual labour. Driving is not advisable until 4 to 6 weeks following the surgery.

After an anterior cruciate reconstruction, bike riding and swimming is usually permitted at 4 weeks with running commencing at 3 months post-operatively. A full return to sporting activities is usually not advised for 9 to 12 months to allow the full strength of the graft to be achieved.