



**CRUCIATE LIGAMENT INJURY
(KNEE)
RECONSTRUCTIVE SURGERY**



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Anterior cruciate ligament reconstruction

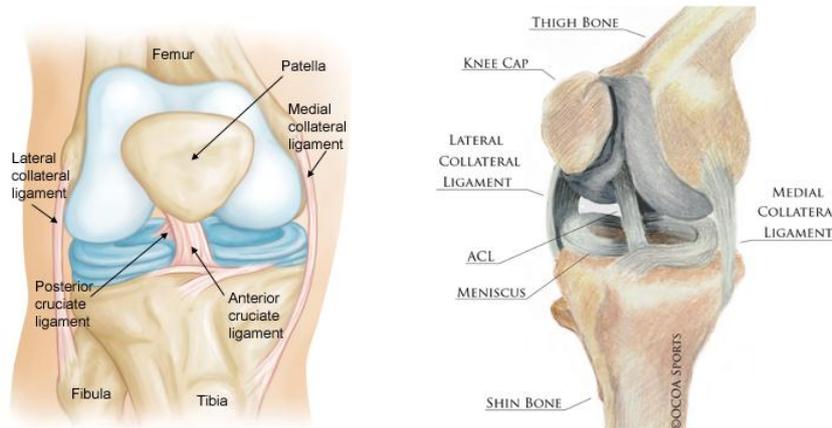
(Information for health workers, the public and patients in Ghana)



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The knee

There are two main ligaments inside the joint, the anterior and posterior cruciate ligaments. They are very strong and they contribute significantly to the stability of the knee as do other structures including the outer knee ligaments (collaterals), muscles and other tissues. The anterior cruciate ligament prevents the shin bone (tibia) sliding too far forwards and the posterior cruciate ligament does the opposite. Together, they also resist twisting and rotational stresses on the knee. In general, anterior cruciate ligament knee injuries are often sustained from sports when a weight bearing leg is twisted in motion. Posterior cruciate ligament injuries are uncommon

Anterior cruciate ligament reconstruction is indicated in patients who have suffered significant injury to the ligament such that the ligament is not functioning well. It may also be associated with other injuries. The symptoms may include swelling and pain initially. Knee instability (giving way), inability to make a quick turn to the side during walking or running, swelling pain and lack of confidence in the knee are some of the functional problems presented by patients. Some patients who place low physical demand on their knees (low

activity levels) may not have to have surgery but strengthen some specific muscles to support the knee in addition to curtailment of physical activities.

The goal of reconstruction is to prevent knee instability, minimise donor site complications and return to desired levels function/activity. Reconstruction surgery is arrived at following clinical examination of the knee and special radiological examinations. Sometimes clinical findings may provide conclusive information but arthroscopic surgery could be done in the in the first instance followed by reconstruction. The plan for the management of the ligament injury will be discussed with you by your surgeon prior to the operation. Special screws are used to fix the graft to the bones (femur and tibia).

Types of grafts

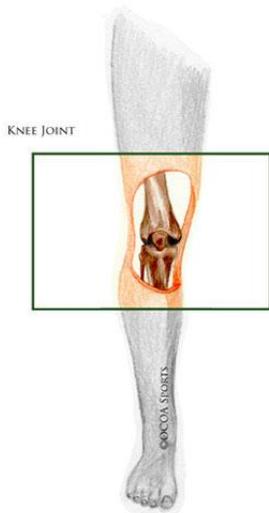
- Patellar tendon autograft (from the patient)
- Hamstring tendon (semitendinosus, semimembranosus) autograft
- Quadriceps tendon autograft
- From a cadaver- patellar tendon, Achilles tendon, semitendinosus, gracilis, or posterior tibialis tendon (Allograft)
- Synthetic graft (dacron)

Elaboration on grafts.

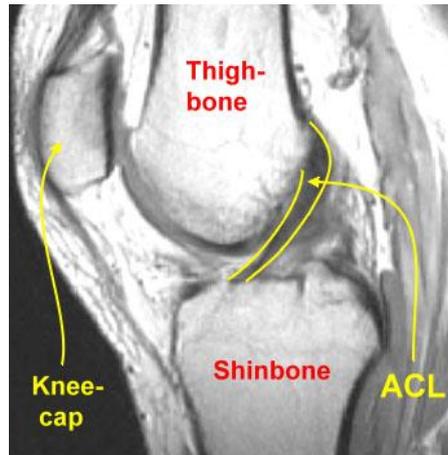
There are two main forms of grafts that can be used for the surgery. One way is for the surgeons my harvest your own tendons from around your knee. This could be some of your hamstrings or patella tendon (with a bit of bone). If it is your own tissue we refer to the tissue harvest as autograft. It is known that the knee muscle weakness of up to about 5 to 10% could be experienced following autograft but often with exercises to strengthen the existing muscles, there is often not much noticeable impact. Some footballers with knee reconstruction do go for the treatment to enable them return to sports. Key football players in the English premiership have been able to return to high level of competitive football after anterior cruciate ligament reconstruction.

In some advance centres, donated tendon grafts by individuals are properly sterilised and can be used for the ligament reconstruction with preservation of your own tendons. It requires a very high standard of care at a high cost to manage tendon donor bank and also to attract people to sign up for donation of their tendons in the unfortunate event of loss of life. Such a graft will be called 'allograft'. It is a popular choice in patients who have had failed primary or multiple reconstruction.

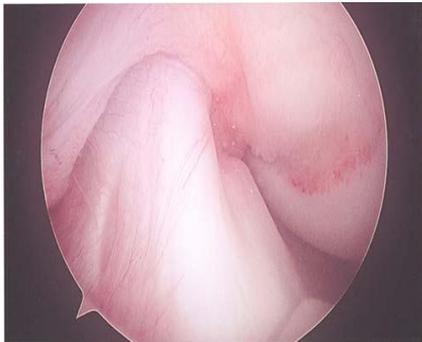
There a few centres that may choose to use artificial materials (dacron) for the surgery of cruciate ligament reconstruction. Some patients do get joint inflammation from the materials but in the recent past the ligament has been improved. An example is the LARS Ligament (Ligament Advance Reinforced System) developed by Professor Labreau of Dijon, France. It has now become useful in patients with multiple ligament reconstruction of the knee as one cannot sacrifice all the ligaments of the knee without losing too much strength within the leg defeating the objective of the surgery.



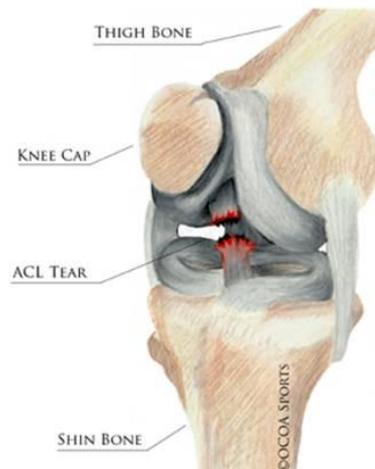
The leg showing the knee



MRI Scan of the knee highlighting normal anterior cruciate ligament(ACL)



Normal looking Anterior cruciate ligament Right knee



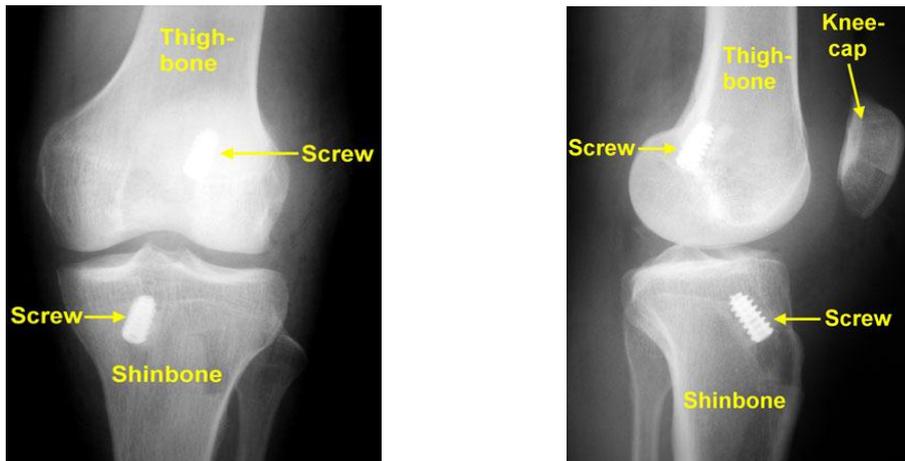
Ruptured Anterior cruciate ligament



Bone patella tendon bone graft harvest – source



Reconstructed ACL

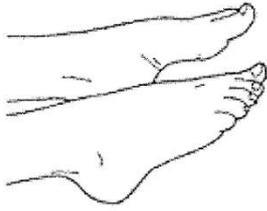


X-ray images of knee after ACL reconstruction showing screw positions in bone

There will be so much to discuss with your surgeon regarding your cruciate ligament reconstruction such as surgical approach with or without arthroscopy, with limited open exposure, options, complications, outcome factors, rehabilitation programme which may differ from surgeon to surgeon. The rehabilitation programme by the authors is based on bone patella tendon bone graft reconstruction and may differ from others. Surgery may take approximately one hour. A knee bandage will be applied in theatre after surgery.

You will be expected to walk and self exercise initially under the instruction of your surgeon and physiotherapist. Admission is usually no more than two nights (Ghana). You will be encouraged to mobilise full weight bearing and go through knee flexion and extension (including locking your knee in full extension). Exercise against resistance such as in the gym is not recommended for the first six weeks. Subsequently, your physiotherapist will take you through controlled exercise against resistance over the second six weeks (depending on your progress). On the average, jogging is encouraged after 12 weeks and the minimum time that most patients can return to sports is six to nine months after surgery. (For illustration of basic knee exercise for the first six weeks please refer to page 6)

Physiotherapy Exercises following Anterior Cruciate Ligament Repair



Lying on your back or sitting.

Bend and straighten your ankles briskly. If you keep your knees straight during the exercise you will stretch your calf muscles.

Repeat _____ times.



Lying on your back with legs straight.

Bend your ankles and push your knees down firmly against the bed. Hold 5 secs. - relax.

Repeat _____ times.



1. Lie as shown with _____ knee bent partially
2. Press heel to floor
3. Hold _____ seconds
4. _____ repetitions, _____ times per day



Lying on your back.

Squeeze buttocks firmly together. Hold approx. _____ secs. Relax.

Repeat _____ times.



Lying on your back.

Bend and straighten your leg - keeping within the range of motion of _____ to _____.

Repeat _____ times.



Lying on your back.

Place a pillow or rolled up towel under your heel and let your knee fully straighten.

Hold _____. Repeat _____.

What complications can happen?

a. Complications of anaesthesia

Your anaesthetist will be able to discuss with you the possible complications of having an anaesthetic. These are very minimal and a good pre-op assessment and appropriate medical preparation will help make your anaesthetic experience safe.

b. Surgical complications are very infrequent. Some of these can be serious and can even cause death (risk: 1 in 100,000). A few of the complications that may occur are as follows:

1. General complications of any operation Pain, Bleeding, numbness around scar, Infection in the surgical wound Unsightly scarring Blood clots Difficult. If you get a lot of blood in your knee afterwards (called haemarthrosis), it will be swollen and painful (risk: 1 in 100). Rarely requires another surgery.

2. Developing a lump under the wound from bleeding is rare.

3. Nerve damage – may present as numb scar in rare cases the leg with weakness and drooping foot.

4. Deep Vein Thrombosis. Blood clot in the veins of the legs. The most important issues are to tell your doctor beforehand if you are on any medication like the Contraceptive pill or even more importantly, if you have ever had a clot before - which puts you at particular risk. The usual problem is a painful, swollen calf within a few days to a few weeks after your operation. It is a potentially fatal condition because the clot, if left untreated, can move into the lungs. If you do get a painful, swollen calf in the weeks following your surgery please contact your hospital as an emergency. Blood clot could spill into your lungs which could be fatal (Pulmonary embolism). Fortunately, this is rare after knee.

5• Pain (in rare cases – abnormal response of local nerves to the surgery called occur Complex Regional Pain Syndrome). and.

6. Progression of a pre-existing disease such as arthritis,

7. Swelling

8. Stiffness of knee, tightness in the knee

9. Complications specific to ACL reconstruction

- Failure of graft – rupture, loose screw within bone, within joint, outside bone (failure ranges from 1 to 30%). Less commonly are: -
- Impingement of graft within the joint
- Weakness in knee/leg muscle
- Anterior knee pain and bone defect from the donor site, patella fracture (BTB),
- Prominent graft fixation implant – screws, staples
- Flexion deformity of knee
- Rubbing noises within the joint

Decision time.

The decision to have knee surgery will depend on the extent of damage to your anterior cruciate ligament and whether it affects your quality of life and your career objectives. If your knee does not feel unstable and you do not have an active lifestyle, you may decide not

to have anterior cruciate ligament (ACL) surgery. However, when deciding whether to have surgery you should be aware that delaying surgery could result in further damage to your knee.

What happens if I decide not to have the operation?

You should make sure that you have been well informed about the benefits and risks of surgery as well as the consequences of leaving the injury untreated. If the instability is not addressed, it could cause rapid damage to the internal structures of the knee including the meniscus and the bone cartilage (leading to osteoarthritis). Here are some additional information that you need to consider with your surgeon when deciding for or against surgery.

- **your physiological age** – if you are physiologically older than 45 years and you are not very active, then maybe in the balance, there is no need for surgery. Physiotherapy, curtailment of physical stresses on your knee including sports may be adequate to minimise symptoms and further damage to your knee - in which case surgery is less likely to be indicated. Young children also can sustain this injury but surgery has to be done in such a way that the growing bone is not damaged.
- **your lifestyle** – some form of busy lifestyle may hinder rehabilitation of your knee after surgery. If your lifestyle will not allow for adequate rehabilitation, you are probably not ready for treatment
- **your job** – sedentary jobs place limited stresses on knee and such patients could consider external physical rehabilitation programme. If you are engaged in heavy manual physical jobs involving stresses and twists on knee then you may benefit from surgical repair.
- **Functional stability of your knee** – if your knee gives way while performing daily challenges of life, you are at increased risk of doing further damage to other joint structures like bone cartilage and the menisci if you do not have surgery.

References:

1. Da Silva et al. Single-Bundle ACL Reconstruction Using Patellar Tendon Grafts: J Bone Joint Surg Am. 1983; 65:154-162.
2. Bach BR Jr, Jones GT, Sweet FA, et al. Arthroscopic assisted ACL reconstruction using patellar tendon substitution: two year follow up study. Am J Sports Med. 1994; 22:758-767.
3. Kruse et al. Rehabilitation after anterior cruciate ligament reconstruction; A systematic review. The Journal of Bone & Joint Surgery, Volume 94, Issue 19

This document is intended as a guide only and should not replace advice that your relevant health professional would give you.

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