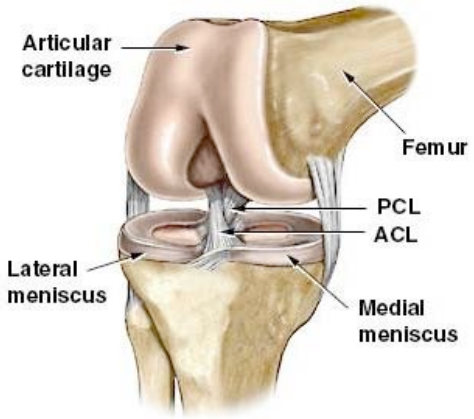
Sports Traumatology Centre of the University of Tartu Hospital



RUPTURE OF ANTERIOR CRUCIATE LIGAMENT (ACL)

What is the function of ACL?
ACL extends from the anterior part of the tibia to the posterior part of the femur in the middle part of the knee. It is responsible for the anterior stability of the knee joint. In addition it limits the shift of the inferior part of the joint in the forward direction.

Why does ACL injury occur, and how?
The main causes of the injury are contact sports or alpine skiing. The cause is twisting/shifting or overextension mechanism. As a rule the ligament itself ruptures. In children, adolescents and elderly patients ACL may be torn from the tibia with a piece of bone.
The injury is complex in most cases. This is accompanied by injuries of different internal and external knee joint structures. Meniscus rupture, cartilage damage, rupture of lateral ligaments, bone fracture and intraosseous traumatic inflammation are typical.
The knee becomes swollen in case of fresh injury – as a rule haemarthrosis is present and there is a feeling of instability (the knee dislocates).

How is ACL injury diagnosed?
To identify the injury, the doctor will assess:
- the injury mechanism and post-traumatic course (repeated joint dislocation),
- the doctor performs instability tests (comparing the injured knee with the healthy knee).

- An x-ray is required for assessment of bone structures and general status of the joint.
- MRI (magnetic resonance imaging) is indicated for elaboration of the extent of the injury.

When does ACL injury require surgery?

Not every ACL injury should be operated on!

To determine the need for surgery patients are divided into three main groups:

1. top-level contact sports athletes whose sports activities are interrupted by this injury with high probability. They are operated on in the early stage of injury.
2. physically active people who have signs of knee joint instability during sports despite rehabilitation and the use of special bandages. The operation is performed after 2 or more instability episodes.
3. people who have knee joint instability moments in everyday life or at work that limit usual physical activities.

Why is ACL injury operated on?

If repeated signs of knee joint instability occur, there is a great risk of injuring important intra-articular structures: meniscus and the articular surface. This may lead to the development of irreversible articular changes or arthrosis.

When is ACL operated on?

As a rule ACL operation is not recommended in the acute phase: swelling is present, which increases the risk of inflammation. Also joint mobility problems may develop after surgery.

During the subacute phase, i.e. when the swelling is reducing (about 2 weeks after surgery) the operation is usually performed when injuries of other ligaments or the knee joint block caused by meniscus rupture are present.

Athletes have surgery 2-3 months after surgery after joint mobility and muscle function have recovered during rehabilitation and/or if a feeling of instability persists despite rehabilitation.

How is surgery performed?

Usually the surgery is performed arthroscopically.

As it is not possible to stitch back the ruptured ligament (except a tearing injury with a bone fragment), ligament plasty is performed using the patient's own ligaments (autotransplant):

1. from the posterior part of the thigh the semitendinosus and gracilis tendon (about a 3 cm long additional incision is made in the attachment region of tendons on the medial surface of the upper shin, the tendons are prepared and a new ligament is formed),
2. patellar tendon with bone pieces from the patellar and tibial attachment points (additional incisions are made in the upper and lower attachment regions of the tendon).

Bone channels are bored into the tibia and femur, a new transplant is introduced into the joint arthroscopically and fixed with screws or special anchor systems. Concomitant meniscus and cartilage injuries are treated during the same operation.

It is possible to use donor transplants, but its requirement is determined by the attending surgeon and the patient.

What are the risks of surgery?
In addition to general risks like haemarthrosis and infection the following risks may also occur:

- restriction of mobility after surgery,
- overstretching the transplant and development of new instability caused by this,
- deep vein thrombi.

It is important to follow the post-operative recommendations of an orthopaedist and rehabilitation specialist to avoid complications.

Contraindications of surgery!

1. Manifest wear of the joint – arthrosis
2. BMI >35.
3. Concurrent diseases – e.g. cardiac diseases.
4. Limited cooperation ability

What are the post-operative activities?
Post-operative recovery takes place in cooperation with a rehabilitation specialist
The aim is early restoration of joint function. Limitation of post-operative mobility with a special bandage is not required as a rule.
After surgery it is important to use a cold bag or cold machine continuously for the first 5 days to avoid swelling as well as to relieve pain. Analgesic treatment prescribed by the attending doctor is added.
Washing the wound region with flowing water is allowed from the third day after surgery.
Walking with crutches and partial load is recommended about 2-3 weeks after surgery, when the primary muscle control and walking pattern have been recovered.
Full mobility of the knee joint is usually achieved within 2-3 months.
Controlled sports like running, cycling and swimming are possible in about 3 months. Contact sports 6-8 months after surgery.

The duration of hospital stay is usually up to 3 days.
The capacity for sitting work is recovered within 2-3 weeks.
The capacity for standing and physical work is recovered within 2-3 months.

What are the results of surgery?
Stability of the knee joint is restored with ACL plasty and along with that the patient's return to the previous level of activity.
90% of ordinary people and 80% of contact sports athletes achieve their previous activity.
Long-time results (5-10 years later) often depend on the damage caused by general joint trauma and physical activity.

Preparation for surgery:

1. Elbow crutches
2. Cold bags and/or cold machines for the post-operation period
3. Sufficient time for rehabilitation and recovery

Sincerely, Sports Traumatology Centre