

# Anterior cruciate ligament – commonly injured

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UPDATE

The anterior cruciate ligament (ACL) is the ligament most often requiring reconstruction in and about the knee. The procedure has come a long way over the years, with results of reconstruction now reproducible and reliable. Not all ACL deficient knees require reconstruction. However, in the symptomatic ACL-deficient knee that fails to respond to non-operative measures, a reconstruction offers the patient the best likelihood of returning to their previous level of functioning.

A reconstructed knee cannot be said to be the same as an undamaged knee, however for the vast majority of patients it is significantly better than an unstable knee.

Surgery is recommended for those for whom non-operative measures have failed and as a rule of thumb, the young active patient with a high expectation is more likely to benefit from surgery.



■ A disrupted ACL as seen at arthroscopy.

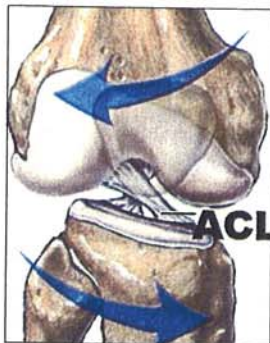
## Diagnosis - History

**Mechanism of Injury.** The patient usually reports a specific incident during which a weight-bearing twisting force is suffered. This most often occurs during sport but frequently occurs in a fall from a motorbike or from a height.

**Acute Symptoms.** The patient often reports hearing and feeling a crack. It may be reported as



sounding like a rifle shot and heard by others in the vicinity. Pain is immediate. The patient is unable to walk and is usually carried off the ground. When the patient has recovered enough from the immediate pain, they usually report that their knee is tensely swollen



**Chronic Symptoms.** The patient reports instability of the knee, classically reported as the knee "giving way" when walking on uneven ground or changing direction whilst running. The patient can often run in a straight line on a level surface without difficulty.

**Associated injuries** may include

- ◆ Medial collateral ligament injury.
- ◆ Meniscal injury (acute injury as seen at arthroscopy here).
- ◆ Bone bruise (MRI diagnosis).
- ◆ Fracture.



## Diagnosis - Examination

In the acute setting it is difficult to examine the knee fully due to the tense effusion and pain.

Lachmanns test requires slight only flexion. With the patient supine, the knee is supported in 30 to 40° of flexion and tested for excess anterior/posterior movement. This is the easiest and least painful test to perform in the acute setting.



The anterior draw test (seen here) can be performed if the knee can be flexed to at least 90°. With the foot stabilized, the knee is flexed, and tested for excess anterior/posterior movement.

In the chronic setting the Pivot shift test can be performed. Patients are very wary of this



test after it has been performed on them once! (Your first chance at performing this test is your best chance.) The knee is placed in full extension, valgus force is applied and the knee is flexed. In a positive test the knee is noted to reduce with a clunk at approximately 30° of flexion. The clunk can be both seen and felt by both patient and examiner.

It may be helpful to examine the acutely injured knee after aspiration of the haematoma. Haematoma aspiration also aids with pain management. Aspiration should be performed using an aseptic "no

touch" technique as there is always the risk of introducing infection.

## Special Tests

- ◆ X-ray to rule out fracture
- ◆ CT arthrogram
- ◆ MRI

## Treatment

### Physiotherapy

Specific exercises to strengthen the hamstring muscles are undertaken. This may give the patient a knee stable enough to allow desired activity.

### Surgery

Surgery is usually offered for the unstable ACL deficient knee if non-operative measures have failed. 60% of reconstructions in Australia are currently performed using hamstring tendon harvested from the patient. 40% use the middle 1/3 of the patella tendon. The quadriceps tendon can be used, although rarely in Australia.

ACL reconstruction is well tolerated, especially if the hamstring technique is used. Patients are usually able to straight leg raise within 24 hours of surgery. 90° flexion is expected in the first day or so following surgery. Crutches are usually required for a few days post operatively.

### Post Operative Management.

Patients are encouraged to gradually rehabilitate their knee. An exercise program to strengthen the muscles about the knee (which are usually wasted as a consequence of the inactivity). Sporting activity such as running, swimming cycling and gymnasium strengthening can be undertaken over the first few months following surgery. Contact sport or other "at risk" activities such as football or netball must be avoided for a full 12 months to allow the graft to mature and regain strength.



■ MRI showing an ACL disruption



■ The arthroscopic view immediately post reconstruction.