

Cruciate Ligament Rupture and Tibial Plateau Levelling Osteotomy (TPLO)

My pet has a ruptured cruciate ligament. What does this mean?

There are two cruciate ligaments in the knee (stifle joint) of dogs, the cranial cruciate ligament (CCL) and the caudal cruciate ligament, and their job is to prevent forward/backward movement and rotation of the joint. The cranial ligament is usually the ligament that ruptures, and this causes over extension and internal rotation of the knee joint.

What causes the ligament to rupture?

The most common cause is progressive degeneration of the ligament, the reason for which is still elusive despite years of research. Abnormal conformation and gait, shape of the tibia (shin bone), obesity, and lack of fitness have been suggested as a cause but not proven.

Signs and symptoms

Lameness is the main symptom of cruciate rupture, and this can be sudden in onset or more gradual.

The severity of lameness can also vary from mild to almost non-weight-bearing. This is often related to the type of cruciate ligament disease:

1 – Partial rupture:

Typically seen in young, large breed dogs. Lameness can be mild initially but becomes worse with progressive ligament degeneration. Usually, the ligament will go on to rupture completely.

2 – Complete rupture:

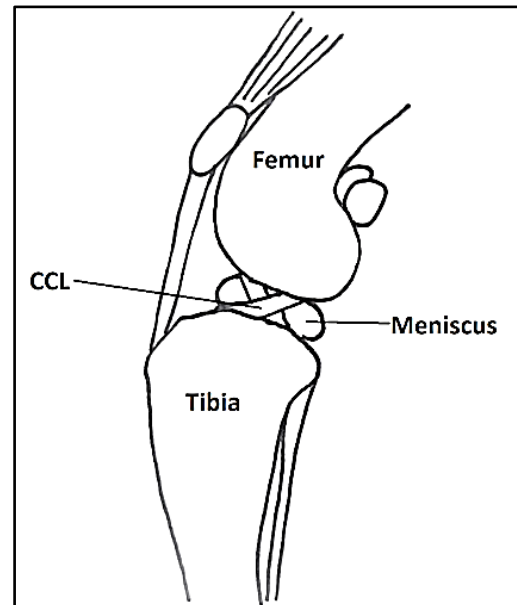
This is usually seen in middle-aged dogs, and the ligament may rupture during normal exercise. Lameness is usually marked, and this can improve initially but typically dogs remain with a limp.

3 – Traumatic rupture:

Sometimes there is a history of trauma such as a road traffic accident or getting a leg stuck when jumping over a fence. Lameness is usually sudden in onset and severe.

Diagnosis

Diagnosis is not often made on clinical examination alone; knee joints in dogs with long-standing CCL rupture often are not markedly painful on manipulation, and it can be difficult or impossible to assess the integrity of the ligament in conscious dogs, especially those who are tense. Suspicion is usually raised when a firm swelling on the inside of the knee is felt, and there may be muscle wastage around the thigh.



Diagnosis is confirmed when the dog is sedated or anaesthetised for further palpation of the knee and radiographs. Two tests to check for ligament rupture are 'cranial draw' and 'tibial compression test', which are positive when the ligament is ruptured. Sometimes the tests are falsely negative if the rupture is only partial, and in these cases a presumptive diagnosis is often made on the radiographic findings. Signs on radiographs include arthritic changes and joint effusion (an increase in the normal volume of joint fluid).

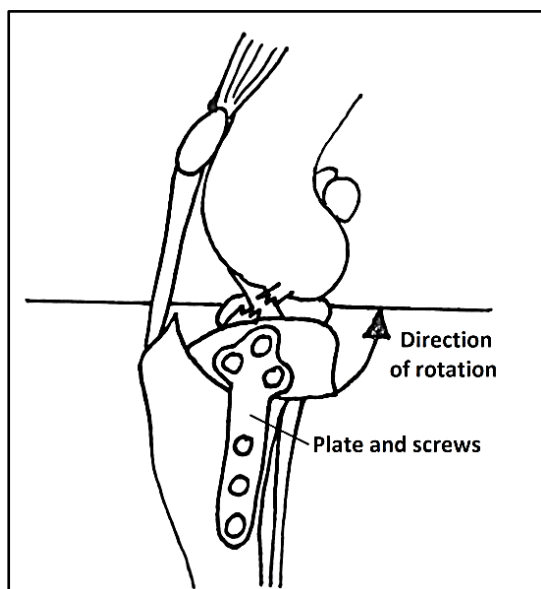
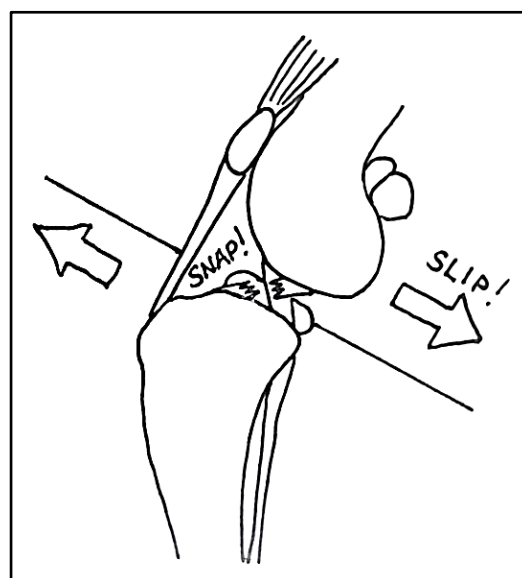
What is the treatment for cruciate rupture?

Surgery is usually recommended, though some small dogs e.g. those <10-15kg will improve with conservative treatment (a 4-6 week period of rest, anti-inflammatories, and weight control followed by a controlled return to exercise).

There are numerous different surgical techniques for the treatment of cruciate rupture, though the most common, and the type we usually perform at Cave Veterinary Specialists, is the tibial plateau levelling osteotomy (TPLO).

What does TPLO involve?

Unlike humans, dogs and cats walk on their tiptoes with their knees bent forward. Normally, when forces are applied down through the thigh bone (femur) across the knee joint to the tibial plateau (the weight-bearing surface of the tibia), the CCL prevents forward-backward movement of the joint by preventing the femur from moving backwards. When the CCL is ruptured, this movement is no longer controlled and during weight-bearing the femur 'slips' because the tibial plateau slopes backwards.



During tibial plateau levelling osteotomy, a curved cut is made in the top of the tibia, allowing rotation of the tibial plateau. The bone is secured in its new position with a metal plate and screws. The aim of rotation is to alter the angle of the tibial plateau to eliminate the need for the cranial cruciate ligament; the femur is less prone to slipping down the tibial plateau when the dog/cat bears weight, therefore joint stability is improved.

During surgery, the joint itself will be examined by an 'arthrotomy' (incision into the joint) to assess the cruciate ligament and the menisci. The

menisci are cartilage cushions that act as shock-absorbers in the knee, and there is one on each side. Sometimes, in association with cruciate ligament rupture, there is a meniscal injury due to the instability of the joint. Usually, it is the inside (medial) meniscus that is torn, and this is painful. Treatment involves surgical removal of the torn portion.

Are there any possible complications?

TPLO is a major surgery that is technically difficult, therefore complications are possible.

Minor complications include swelling around the surgical site, wound discharge, patellar ligament strain and superficial wound infection.

Major complications include deeper infection (which will require antibiotics and sometimes removal of the plate and screws), fracture of the tibia, and breakage of the plate or screws. Occasionally a meniscal injury can develop after TPLO surgery, and this unfortunately requires another surgery to remove the injured portion. The proportion of dogs that develop a complication and require further surgery is reported to be between 2 and 10%.

Recovery period

Most pets make a very good recovery from surgery and will be using the leg within a few days. Use of the leg should continue to gradually improve, with over 90% of dogs making a full recovery by around six months. Long-term, it is inevitable that some arthritis will develop in the joint despite surgery. The severity and consequence of this depends on the individual i.e. it may never cause a problem, but some dogs will develop lameness.

How shall I look after my dog following surgery?

You will be provided with a separate sheet detailing post-operative care. Briefly, this involves an initial period of strict rest for between 6-8 weeks. Use of a cage is usually required to limit exercise, with controlled short lead walks only. Exercise limitation must be continued until there is good radiographic evidence of bone healing. Pain killers are given for around 7-14 days to ensure comfort. Usually, we will ask you to bring your dog back to us for radiographs between 6-8 weeks after the operation. If we are happy with your dog's progress, we will then advise a gradual return to exercise over a further 6-8 weeks.