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# CRANIAL CRUCIATE LIGAMENT (CCL / ACL)

## Introduction

Injury to the cranial cruciate ligament (CCL) is the most common cause of lameness in the hind limb of dogs. Injury may occur as a single traumatic incident, or progressively over a period of time. The CCL is constructed like two ropes twisted around each other and injury may result in tearing of a few fibres, or tearing of one or both (complete rupture) portions of the CCL. Unfortunately a partially torn CCL will usually progress to a complete rupture over time due to underlying CCL disease, ongoing strain and inflammation.

Injury to the CCL results in instability of the knee joint (stifle) which then stimulates progressive development of osteoarthritis (OA), and may result in damage to the cartilage covering the joint or tearing of the cartilage pad (meniscus). The greater the damage that occurs within the joint then the more severe will be the ongoing OA which will develop.

Clinically many dogs will develop mild to severe lameness in the limb at the initial time of injury, with pain and swelling being detectable within the joint. After 1-6 weeks the joint will appear to moderately improve but will never regain full function. As the ongoing joint instability induces further damage and degeneration, the lameness will progress and may show periodic increases in severity associated with periods of rest or exercise.

Dogs will often show initial improvement with anti-inflammatory drugs but due to ongoing damage this response will reduce over time, or the lameness will recur as soon as the drugs are stopped. Ideally the joint should be treated surgically early in the disease process to re-establish stability and therefore prevent ongoing damage within the joint.

Medical management of CCL rupture may have a place for smaller inactive dogs, however it is generally accepted that for the majority of animals surgical treatment has a far superior outcome for long term functionality and pain management.

A number of surgical approaches are available and have their own relative pros and cons. Each case should be assessed individually and all factors taken into account before deciding on the most appropriate surgical procedure.

The knee may be stabilised through using a variety of different techniques which aim at functionally replacing the CCL with synthetic or grafted materials (intracapsular (fascia lata, patella tendon, primary repair and augmentation etc) or extracapsular repair techniques (lateral suture stabilisation, tightrope etc). Or a number of bone cutting surgeries (corrective osteotomies (TTA, TPLO, TTO,

TWO)) are available for the treatment of CCL rupture. Their aim is to realign the knee in such a way that the CCL is no longer needed for the knee to remain stable when the limb is used. It is important to realise that there is no single surgical repair which ideal for all patient, but instead each dog and owner should be individually assessed and the repair most suitable for the animal and owner selected.

## Diagnosis

A complete clinical, orthopaedic and neurological examination will be undertaken to confirm the cause of the lameness and establish that other problems do not exist elsewhere within the dog. The knee will be assessed for pain, instability, presence of swelling and any thickening around the joint. In some animals heavy sedation or general anaesthesia may be needed to allow a complete physical examination of the joint. X-rays will be required to confirm the diagnosis, allow assessment for any other disease, and facilitate detailed assessment and planning for the surgical repair. Often it may be possible to perform the final assessment under general anaesthesia on the same day as the corrective surgery, thereby allowing a single anaesthetic to be used for the final assessment and surgery.

## Prognosis

Surgical correction of CCL rupture has a good to excellent outcome in approximately 90% of cases, with the vast majority of dogs being able to return to normal levels of athletic activity after they have recovered from surgery. Selection of an appropriate repair technique for the individual animal may help to ensure the best outcome for your dog.

Despite repair some degree of OA will continue to progress within the joint after surgery, however this may be minimised through use of an appropriate surgical technique. The degree of damage that has occurred to structures within the joint, such as the cartilage pads (menisci), can significantly reduce the amount of OA that will eventually develop within the joint.

Approximately 40% of animals that have a CCL rupture in on knee will go on to rupture the CCL in the other knee within 12-18 months. If there is detectable OA in the unaffected knee on X-ray then this risk increases to approximately 60%. When your dog is admitted for diagnosis the unaffected knee will also be assessed to help you in your decision making process.

