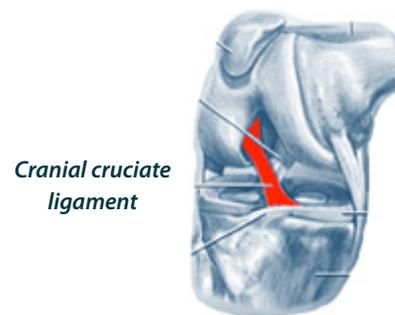


# Cranial cruciate ligament rupture in Dogs

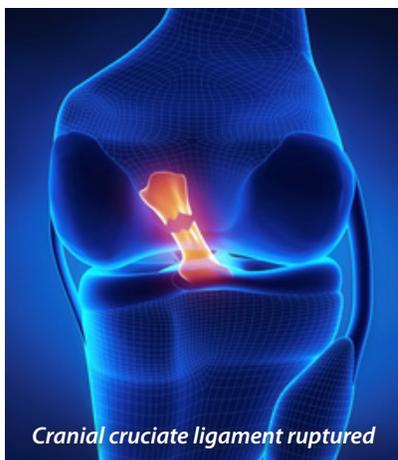


*Cranial cruciate ligament rupture is one of the most common orthopedic conditions in dogs.*

Rupture of the cranial cruciate ligament is a condition affecting the dog's knee (also named stifle). This ligament is one of the most important stabilizers of the dog's knee. In humans, this ligament is called the anterior cruciate ligament and can also tear. The origin of this condition, however, is more complex in dogs compared to humans. Rupture of the cranial cruciate ligament is generally a chronic condition in dogs which often affects the same breeds, whereas the origin is exclusively traumatic in humans.



The etiology itself has not yet been identified in dogs and is subject to a lot of research, but a genetic predisposition is strongly suspected. Progressive degenerative disease of the cranial cruciate ligament is systematically reported and it is increasingly accepted that the origin of this condition is multi-factorial.



Hyperactivity or poor physical condition, overweight, particular bone conformations, also seem to influence the appearance of this condition.

Cranial cruciate ligament rupture, at first subtle and partial, will evolve progressively and inevitably over several months or years towards a complete rupture. It will sometimes and more rarely sudden onset.

In some cases, particularly in predisposed breeds, this condition will unfortunately also develop in the other knee during the dog's life.

## Predisposed breeds

Labrador, Golden Retriever, Bernese Mountain Dog, Boxer, Rottweiler, Bulldog, Newfoundland, St. Bernard, Staffordshire Terrier, German Shepherd, Mastif ...

## Symptoms

The progressive degenerative disease of the cranial cruciate ligament will initially lead to a mild lameness after activity. You might also note:

- 🐾 Difficulty getting up or getting in the car
- 🐾 A change in the way to sit with the knee extended to the side and not properly flexed under the body
- 🐾 A decreased activity
- 🐾 A decreased muscle mass of the thigh
- 🐾 Pain at knee manipulations
- 🐾 A «cloc» sound (which may indicate a meniscal tear) while the dog is walking
- 🐾 Swelling or fibrosis on the medial side of the affected knee

When a rupture of the ligament is complete or a meniscal lesion occurs, the lameness is then more severe and sometimes nonweightbearing.

Long term, symptoms will also be associated with the development of osteoarthritis such as stiffness, pain, reluctance to play or to do activity and persistent lameness, more or less severe depending on activities and days.



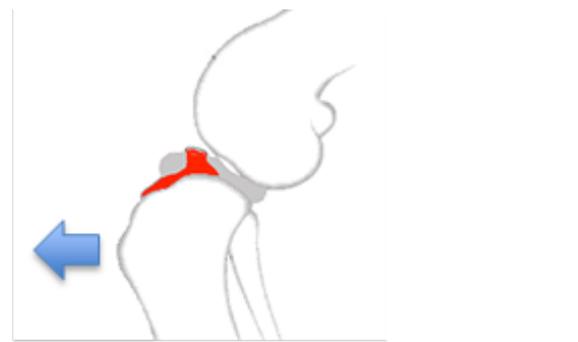
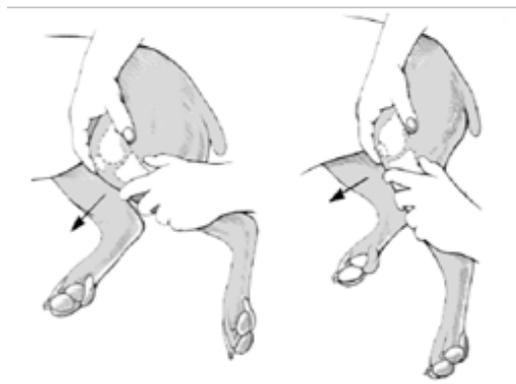
*Meniscus*

Meniscus are two «pads» present in the knee joint that can tear when the cranial cruciate ligament rupture. This tear is very painful and usually leads to severe lameness.

## Diagnosis

Diagnosis of a cranial cruciate ligament rupture is made by combining gait observations, palpations of the knee and X-rays.

Specific palpations will make it possible to demonstrate a complete rupture of the cranial cruciate ligament particularly with the cranial drawer test.



*Cranial drawer movement*

X-rays are performed to:

- 🐾 Confirm joint swelling (accumulation of abnormal fluid in the joint indicating inflammation)
- 🐾 Assess the degree of osteoarthritis
- 🐾 Rule out other conditions that may lead to the same symptoms (bone cancer)
- 🐾 Plan the surgery

X-rays do not allow visualization of the cranial cruciate ligament (intact or torn) or the meniscus. These structures can be visualized using a MRI or by arthroscopy (minimally invasive camera) or mini-arthrotomy during the surgical procedure.



*X-ray of the knee*

## Treatment and prognosis

Many treatments are available to treat a cranial cruciate ligament rupture. The best treatment option for your dog depends on several factors such as your dog's activity level, weight, age, conformation, degree of instability and presence of a meniscal lesion.

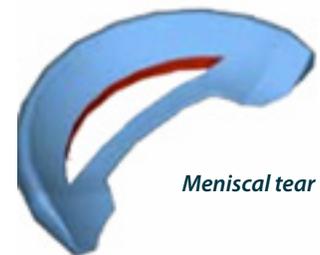
### Surgical treatment

Surgical treatment is usually recommended since it is the only treatment that effectively stabilizes the knee and slows the progression of osteoarthritis. The surgery will address 2 major problems encountered during cranial cruciate ligament rupture:

- 🐾 The instability in the knee created by the rupture of the cranial cruciate ligament
- 🐾 The meniscal tear, very often associated with the rupture of the cranial cruciate ligament

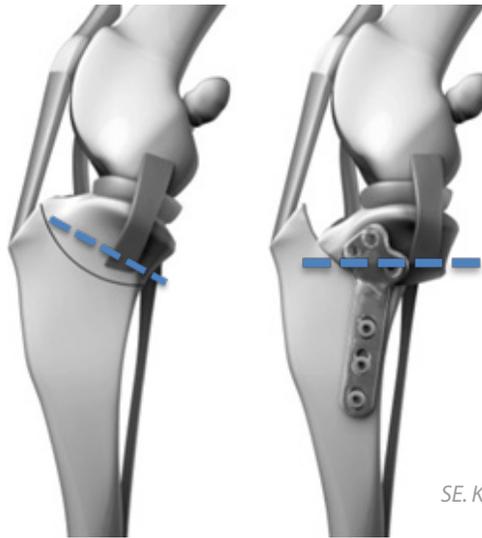
The meniscal tear will be treated by the surgeon by removing the portion of the torn meniscus. To address the instability of the knee, many surgical techniques have been reported and are usually categorized into 2 groups:

- 🐾 Osteotomy techniques which will modify the action of the muscles of the thigh and especially the quadriceps. With this techniques, the cranial cruciate ligament is not replaced, but the biomechanics of the knee are modified to allow good stability of the knee while the dog is walking or running.



*Meniscal tear*

- 🐾 The technique of TPLO for «Tibial Plateau Leveling Osteotomy» is one of these techniques. It is nowadays the technique offering the best long term results with a faster recovery.



*Pre and post-TPLO Knee  
The tibial plateau slope is  
leveling during the surgery*

*SE. Kim Vet Surg 2008 modifié*

- 🐾 Suture techniques for which the cranial cruciate ligament is replaced by extra or intra-articular prosthesis which mimic the action of the cranial cruciate ligament and which will allow the development of fibrous tissue around the knee.

The lateral suture technique commonly known as «modified Flo» technique and the «Tightrope» technique are among these techniques.

They are generally reserved for small dogs because the risk of complications (especially breakage of these sutures) is important in large breed or active dogs and the result less optimal and predictable in the long term compared to the TPLO technique.



*Lateral suture technique or  
« modified Flo »*

*SE. Kim Vet Surg 2008*

## Non surgical treatment

### 🐾 Restricted activity and anti-inflammatory

The lameness associated with a cruciate ligament rupture is often of varying severity from one day to the other, worsens with exercise and improves with the use of anti-inflammatory drugs. However, long-term lameness persists in medium- and large-sized dogs, and osteoarthritis in the knee will limit the return to normal and full activity. The combination of rest and anti-inflammatory drugs is therefore not an ideal treatment for cranial cruciate ligament rupture in dogs. However, it may be appropriate for small or inactive dogs or with a condition contraindicating general anesthesia.

### 🐾 Physiotherapy and rehabilitation

There are many benefits to perform physiotherapy and a rehabilitation program to promote and accelerate the return to normal activity following surgery. However, there is little scientific evidence suggesting that this may represent a reliable alternative to surgical treatment. Occasionally, a very advanced age dog or a condition contraindicating a general anesthesia can make it an attractive alternative.

### 🐾 Knee orthosis

Knee orthosis have been available for many years but there is no scientific evidence to suggest any efficacy for the treatment of cranial cruciate ligament rupture in dogs. The slope of the tibial plateau in dogs, which results in a systematic cranio-caudal movement of the dog's knee (between the femur and the tibia) while the limb touching the ground, is a fundamental anatomical difference with humans.



***In humans, the techniques used are essentially intra-articular. These techniques have been widely studied and used in the past in dogs, but due to anatomical and pathogenic differences they did not produce results equivalent to those obtained in humans.***

## Convalescence post surgery



### Rest

A rest period of 6-8 weeks is usually recommended after surgery. Games, races, jumps and stairs are therefore to be avoided during this period. Outside, only walks on leash are allowed and slippery surfaces are avoided.



### Care

Make sure the surgical wound stays clean and your pet does not lick his wound. An Elizabethan collar is required until the sutures are removed



### Medication

In order to allow optimal comfort of your pet following surgery, anti-inflammatory drugs and painkillers are prescribed.



### Rehabilitation and physiotherapy

Physiotherapy exercises are performed following the surgery to allow an optimal and comfortable recovery of your pet.



### Revaluations

Reassessments are performed following surgery to ensure the proper healing and recovery of your pet.

The owner of a dog exhibiting symptoms of a cranial cruciate ligament rupture should always contact a qualified specialist in order to obtain the best information available to treat this condition.