



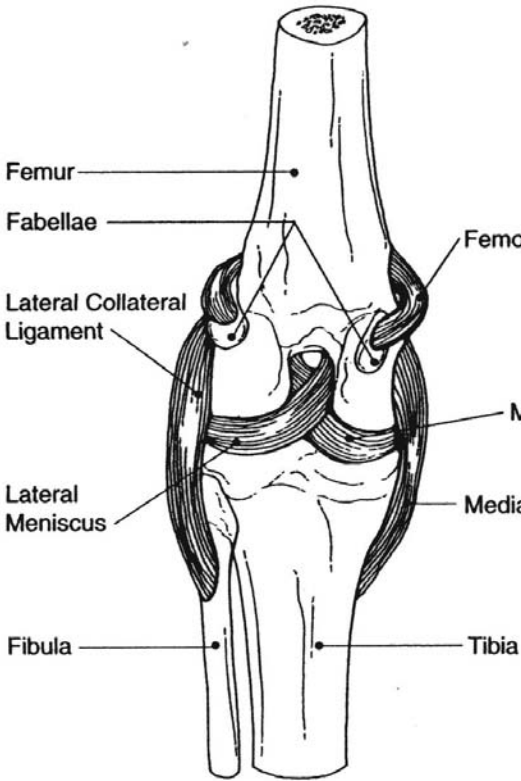
Melbourne Veterinary
Referral Centre

Canine Cranial Cruciate Ligament Disease

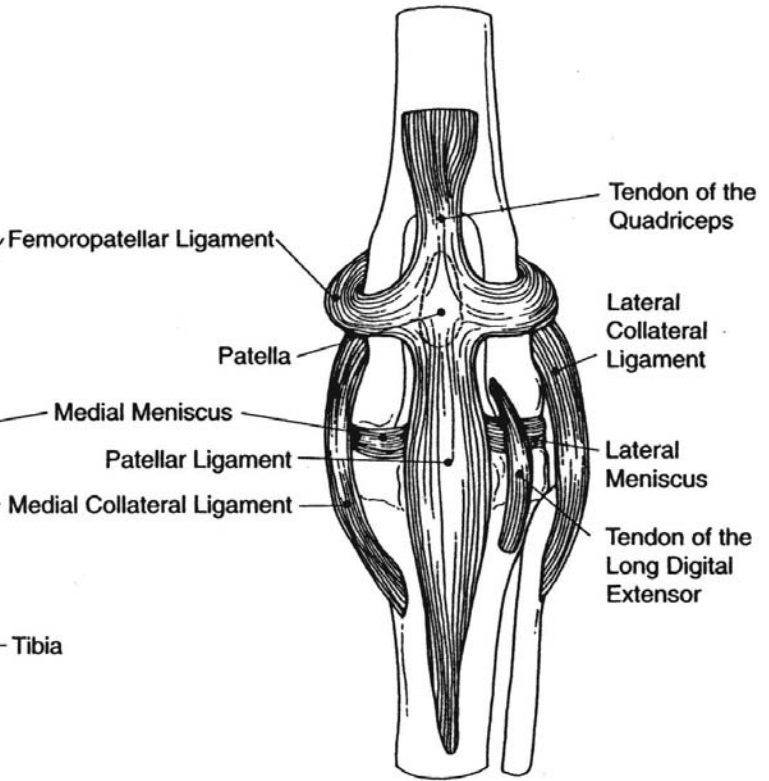
The cranial cruciate ligament is a key supportive structure of your dog's stifle joint (knee). The stifle joint acts as a hinge that allows bending of the hind limb, enabling your dog to walk, run and jump. A partial or complete tear of the cruciate ligament can lead to instability of the joint, causing pain and lameness. Torn ligaments, unlike skin and bone, do not have the ability to heal. Surgical intervention is currently the best option to minimise the progression of degenerative changes in your dog's unstable knee. Surgery provides the best opportunity for return to function.

The stifle joint is comprised of three bones, the femur, patella and tibia. Cartilage protects and cushions the ends of the long bones (femur & tibia). It functions to reduce the effect of concussion and friction between these bones. Muscle, tendons and ligaments hold these bones in apposition, stabilize the joint and render it freely moveable. The joint is surrounded by the joint capsule. There are four major ligaments connecting the femur and tibia. They function to support and stabilize the stifle joint. The medial and lateral collateral ligaments are located outside of the joint. The cranial and caudal cruciate ligaments are located within the joint (note: the joint capsule is not depicted here in order to view the cruciate ligaments). The two cruciate ligaments effectively attach the femur and tibia. They course across the stifle joint forming a cross-like structure. Also housed within the joint are two "crescent shaped" shock absorbing cushions called menisci.

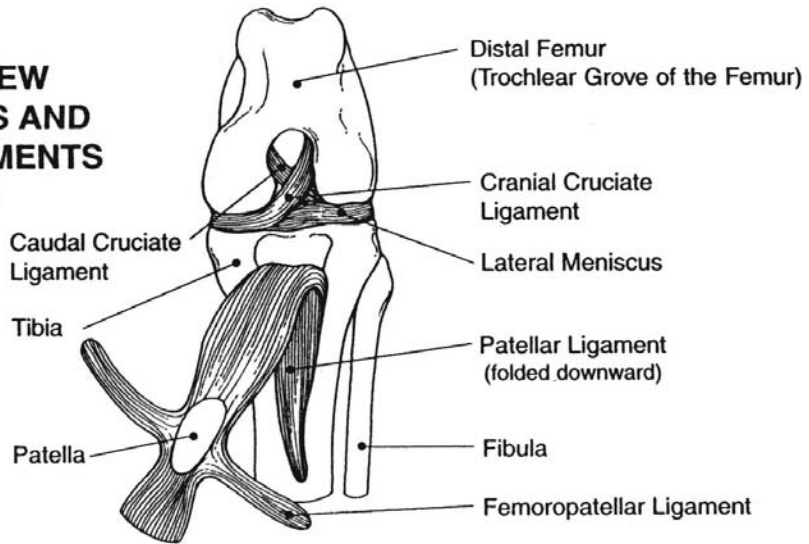
POSTERIOR VIEW



ANTERIOR VIEW



**ANTERIOR VIEW
WITH MENISCUS AND
CRUCIATE LIGAMENTS
EXPOSED**



Description and Diagnosis of Cranial Cruciate Ligament Rupture:

Rupture of the cranial cruciate ligament is one of the most common orthopedic injuries in dogs that results in hind limb lameness. This same injury in humans (anterior cruciate ligament rupture) is most often due to acute trauma that results in damage to an otherwise healthy knee. A small percentage of dogs may suffer a cranial cruciate ligament rupture as a result traumatic injury. However, the vast majority of dogs present with a ruptured cranial cruciate ligament as the end result of a chronic degenerative process. The cause of this process is largely unknown. The current theory is that this chronic degenerative process within the stifle weakens the cranial cruciate ligament rendering it more prone to tears and rupture.

The usual progression of events is as follows:

1. degenerative changes occur within the knee - cause currently unknown
2. partial tear of the weakened cranial cruciate ligament occurs
3. the joint is left unstable
4. osteoarthritis progresses within the unstable joint
5. the ligament eventually ruptures completely

Dogs with a partial tear in their ligament usually present with intermittent lameness that worsens with exertion. This partial tear sets up an inflammatory reaction within the stifle joint. The progression of arthritis and continued weight bearing on the weakened ligament usually leads to its complete rupture. Damage to the menisci (shock absorbers of the knee) is present in approximately fifty percent of dogs that suffer a cranial cruciate ligament rupture. These dogs are usually severely lame, painful and may not be able to bear any weight on the afflicted leg. Fifty percent of dogs that present with a ruptured cruciate ligament will experience the same condition in the opposite knee at some time in the future.

The clinical signs of a ruptured cranial cruciate ligament can vary depending on the extent and chronicity of the injury. There are two tests that can be performed during your dog's physical exam to aid in the diagnosis of a rupture. Your dog's knee will be slightly flexed and pressure will be applied to the tibia and femur to check for instability within the joint. A rupture of the ligament is indicated by the ability to move the tibia forwards relative to the femur ("positive cranial drawer test"). A distinctive bony landmark of the tibial bone (tibial tuberosity) can be felt to slide abnormally during the "tibial compression test" if a rupture is present in the cranial cruciate ligament. If the meniscus is torn a "meniscal click" may be felt or heard upon palpation of the stifle. Sedation is often necessary to properly evaluate the stifle joint due to excessive pain, musculature or joint fibrosis. X-rays of your dog's knee are necessary for the

following reasons: to rule out conditions that may mimic a cranial cruciate ligament rupture (eg: a fracture); to screen for underlying disease that may result in a cranial cruciate ligament rupture and to assess the degree of degeneration already present in the knee. The “perfectly” positioned X-ray is required to allow accurate measurements to be made. On rare occasions samples of the joint fluid may be obtained for analysis if an underlying cause is suspected (eg: septic arthritis or rheumatoid arthritis). These procedures need to be performed with your dog sedated as the stifle needs to be kept immobilized in order to perform these tests. Certainly not an easy task for any dog, especially for one experiencing pain within that joint.

Treatment and Prognosis:

Surgical intervention currently remains the best option for your dog's return to a good quality of life. Either an incision will be made over your dog's knee to allow exploration of the joint or an arthroscope will be inserted into the joint. Remnants of the ruptured ligament will be removed and the menisci will be examined for damage. Damaged regions of the menisci will be removed. The knee will then be stabilized using either:

1. Extracapsular repair. This involves inserting a strong nylon suture that will act as an artificial ligament. This is a proven technique that works well in small dogs.

2. Tibial Plateau Leveling Osteotomy (TPLO): The aim of this technique is to reduce the slope at the top of the tibia which results in the generation of the forces responsible for the instability following rupture of the CCL. This state of the art technique produces excellent results and is well suited to dogs of all sizes and weights.

Which surgical technique is best suited to your dog is determined by numerous factors. Your dog's size, weight, desired level of activity, prior knee surgery and other orthopaedic injuries are all considered! Dr's Laverty and Kudnig will discuss the different techniques with you so as you understand why a procedure has been recommended for your dog.

At Melbourne Veterinary Referral Center we take full advantage of all available modalities of pain management and will create a multifocal plan tailored to the individual patient (eg: intra-articular nerve blocks, injectable & transdermal opioids and oral anti-inflammatories). Upon discharge from the hospital your dog will be sent home with an oral anti-inflammatory to decrease post-operative swelling and discomfort. As your dog's guardian your responsibilities for his/her post-operative care will be as follows: enforce STRICT REST; establishment of a weight loss/control program if necessary; implementation of your pet's physical therapy at home. You are an integral part of the team effort required to successfully recover your pet from a cruciate ligament injury.

With early surgical intervention and attentive post-operative care at home approximately 85 - 90% of all dogs will return to good functional activity levels.

The surgical team here at the Melbourne Veterinary Referral Center wants only the best result for your family member. Direct any concerns or questions you may have to Dr's Lavery or Kudnig.