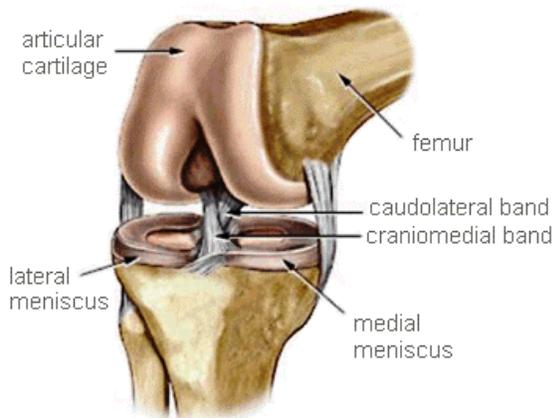


Cranial Cruciate Ligament Injury Overview

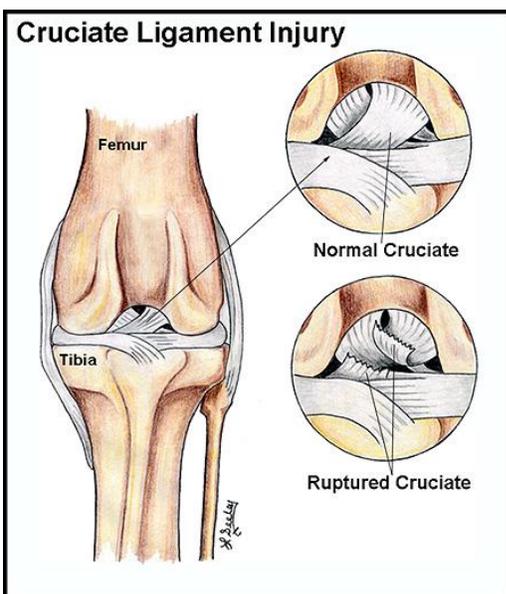
What is a cruciate tear?

Canine cranial cruciate ligament (CCL) disease is the most common orthopedic injury seen in dogs. You may hear veterinarians refer to this injury as an “ACL tear,” which is an adaptation from human orthopedics, but the terms are often used interchangeably. The CCL is a ligament inside the knee that functions to prevent the tibia (shin bone) from shifting in relation to the femur (thigh bone).



Why does the ligament tear?

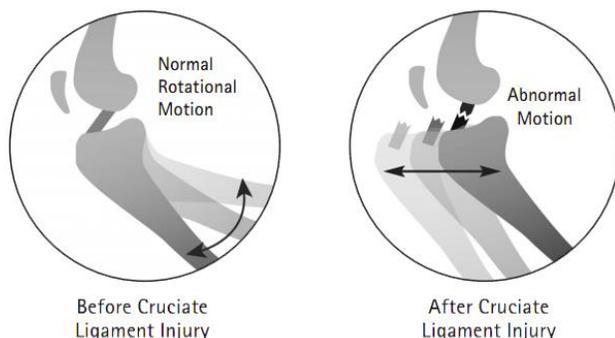
Two general conditions exist regarding canine CCL tears: acute traumatic tears, and chronic degeneration leading to failure. Acute traumatic rupture (as in people), happens most frequently in dogs younger than 4 years of age, and may result from rotating on a planted foot, or stepping in a hole while running. More commonly however, cruciate ruptures occur over time. The cause of the chronic degenerative condition is not fully understood, and likely has multiple factors at play. The top of the tibia is sloped backwards in dogs, as compared to a flat surface in people. This sloped surface generates a force that pushes the tibia forward in relation to the femur each time the dog puts weight on the leg. It is thought that this may contribute to long-term degeneration. The veterinarian may give you a diagnosis of a partial tear, meaning that some of the fibers are torn, but some ligament is still intact. The torn fragments will cause inflammation in the joint, which perpetuates the breakdown of the intact ligament. Unfortunately the ligament cannot heal itself because of its poor blood supply, so often surgical repair will be recommended.



What are the symptoms of a CCL tear, and how is it diagnosed?

Dogs with acute traumatic tears are often severely lame, not placing any weight on the limb. Dogs with chronic degeneration have intermittent lameness that may worsen with activity. You may notice a clicking or popping sound, which may indicate injury to the meniscus (discussed later). If a dog has torn both CCLs at the same time, they often appear to have spinal cord injury (difficulty/unable to rise, not using back legs). A thorough physical exam can make the distinction between neurologic abnormalities and orthopedic injury.

Often no advanced tests are required to diagnose a CCL tear; the injury can be diagnosed during the physical examination. The veterinarian will perform the cranial drawer test and/or the tibial compression (cranial tibial thrust) test. If the ligament is torn, the tibia will move forward in relation to the femur. Sometimes, however, instability cannot be immediately appreciated due to tense muscles, or scar tissue build-up (chronic cruciate disease). If this is the case, a sedated exam can help relax the pet and allow for thorough knee manipulation with no discomfort. In



some cases, a partial tear does not show significant instability, but still causes discomfort to the patient, and an exploratory surgery of the knee may be recommended to confirm the diagnosis. Radiographs (x-rays) can help in several ways, but cannot be used to diagnose the condition. X-rays can be used to judge the amount of arthritic changes in the knee, see joint swelling, and rule out broken bones or other bony abnormalities that may explain why the pet would be limping. Once the diagnosis is confirmed, surgical stabilization will likely be recommended.

How do you treat a CCL tear?

First, treatment can be broken down into two broad categories; medical and surgical. Medical management includes weight optimization (for most patients this means weight loss), strict activity restriction, rehabilitation exercises (range of motion, strengthening) pain medication (often non-steroidal anti-inflammatory medications like Rimadyl or Deramaxx), and ancillary therapies like omega-3 fatty acids, and joint supplements (glucosamine, chondroitin etc.) Small dogs less than 10 pounds have been reported to have acceptable outcomes with this method, but larger dogs generally do not respond favorably. In our experience, even small dogs benefit from surgical stabilization, but each case is considered on an individual basis, and what is best for the pet and the family is discussed.

Surgical treatment can be further broken down into several categories; intra-articular, extra-articular, and osteotomy procedures. Intra-articular procedures include replacement of the ligament inside the joint with several different types of grafts. In general, intra-articular procedures have fallen by the wayside as they have a high rate of failure.

Extra-articular procedures use synthetic materials on the outside of the joint to mimic the action of the CCL. These materials include but are not limited to heavy pound test nylon, and braided fiber tape or fiber wire.

Osteotomy procedures involve making cuts in the bone to alter the forces and geometry to eliminate the need for the cruciate ligament. The two most common osteotomy procedures are the tibial plateau leveling osteotomy (TPLO), and tibial tuberosity advancement (TTA). Each procedure has its own benefits and drawbacks, and each case is considered individually in deciding which procedure is most appropriate.

Bilateral CCL tear (tear in both knees)

The incidence of bilateral cruciate tears is roughly 40% meaning that 4 in 10 dogs with a tear in one knee will go on to tear the ligament in the other knee at some point in their life. A small percentage of dogs may have tears on both sides at the time of original diagnosis, repair is often staged, and the more painful side is fixed first.

Meniscus

The meniscal cartilages are c-shaped cartilages within the knee joint that help to stabilize and absorb shock. When the CCL is torn, shifting of the bones may cause a tear of the medial meniscal horn (medial affected most commonly due to its attachment sites). The incidence of meniscal tears has been reported to be as high as 80% in dogs with complete CCL tears. Meniscal tears rarely occur in dogs with partial CCL tears. The knee joint is explored at the time of surgery to evaluate for meniscal tears. If a tear is found, the torn portion is removed. After the knee is stabilized with surgery, the meniscus is still vulnerable to tearing.