

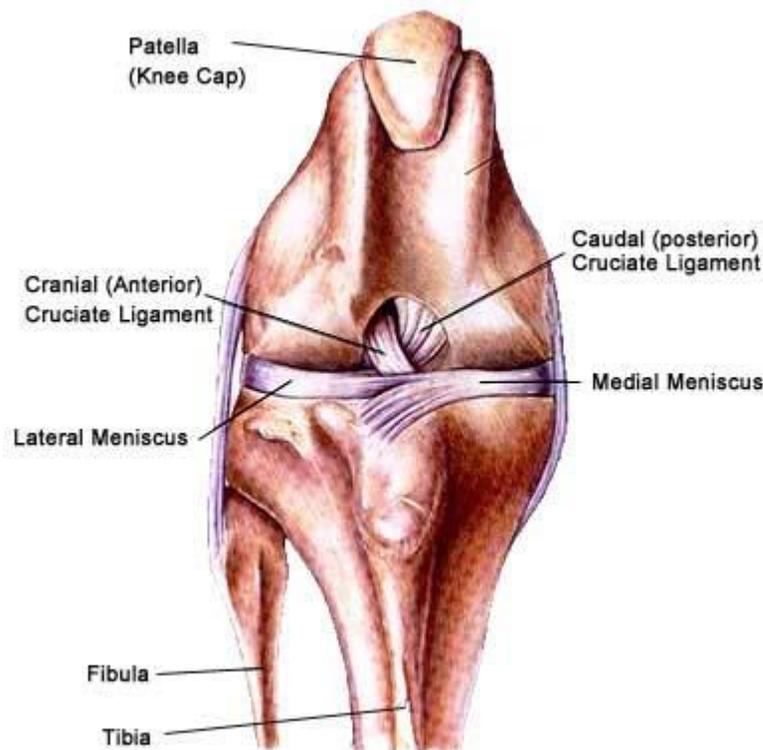
Cranial Cruciate Ligament Rupture in Dogs and Surgical Treatment Using Tibial Tuberosity Advancement (TTA) Method

The cruciate ligaments are tough fibrous bands that connect the distal femur (thigh bone) to the proximal tibia (shin bone). Two cruciate ligaments, the cranial (anterior) and the posterior cruciate ligaments, are found in the knee joint of dogs and cats (and most other domestic animals). These ligaments work like a hinge joint in the knee and are responsible for providing anterior-posterior stability to the knee joint.

Normal Knee Joint of a Dog

Rupture of the cranial cruciate ligament is rare in cats. It occurs frequently in overweight, middle- and older-aged dogs. Certain dog breeds appear to be predisposed to cranial cruciate ligament rupture. Most commonly, the cocker spaniel and Rottweiler are affected. The miniature and toy poodle, Lhasa Apso, Bichon frise, golden retriever, Labrador retriever, German shepherd and mastiff seem to be predisposed as well.

The normal knee joint works as a hinge, keeping the knee stable as it bends. Tearing of the cranial cruciate ligament causes instability of the knee joint and it ceases to function properly. Most cranial cruciate ligament tears in dogs occur gradually, resulting in a low-level lameness that may or may not improve over time. After the ligament tears, inflammation occurs within the joint. Continued use and weight bearing by the dog often causes the ligament to rupture completely. Dogs that rupture one cruciate ligament have about a fifty percent chance of rupturing the other.



Normal Knee Joint of a Dog

Rupture of the cranial cruciate ligament in dogs can also occur acutely. Similar to cranial cruciate ligament rupture in humans, resulting from athletic injuries to the knee, dogs can tear this ligament by jumping up to catch a ball or Frisbee or by jumping out of a truck or off a porch.

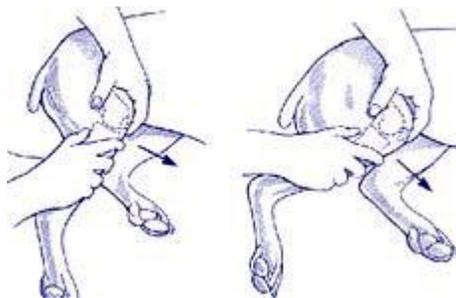
Symptoms of Cranial Cruciate Ligament Rupture

Symptoms usually include a history of acute rear leg lameness. The lameness can be mild, resolve, and then appear again. Some dogs are completely non-weight bearing on the affected leg. Knee joint pain is usually a common symptom. The pain may be unapparent until someone accidentally manipulates the dog's leg. A nip or bite from a normally friendly dog is a good indication that he or she is in pain. The knee may appear and feel swollen and may sound crunchy when put through a series of flexion-extension manipulations.

Diagnosis of Cranial Cruciate Ligament Rupture

Diagnosis of cranial cruciate ligament rupture is usually made by a positive cranial drawer sign. In this test, the dog's knee is slightly bent and anterior pressure is applied to the distal femur while posterior pressure is applied to the proximal tibia. Sliding of the distal femur over the proximal tibia (positive drawer sign) indicates cranial cruciate ligament rupture. Often, with a chronic injury, the cranial drawer sign is less effective due some joint stabilization resulting from a build-up of scar tissue in the joint capsule.

A ruptured cranial cruciate ligament is not always an obvious condition. Careful manipulation and palpation of the knee is required for obtaining an accurate diagnosis. In most cases heavy sedation or general anesthesia is required to conduct this examination



Veterinarian Testing for Signs of Cranial Cruciate Ligament Rupture

If left untreated, a torn cranial cruciate ligament can lead to degenerative joint disease (degenerative arthritis) of the knee. Approximately forty to fifty percent of ruptured cranial cruciate ligaments lead to injuries of the meniscus. A torn meniscus is often felt as a “click” when the knee joint is flexed and extended.

Surgery is the treatment of choice for a ruptured cranial cruciate ligament. Providing that arthritis has not significantly developed, most dogs have a good chance of recovering normal or almost normal function of the knee joint after surgery. Some small dogs; however, show signs of improvement with just rest and limited exercise.

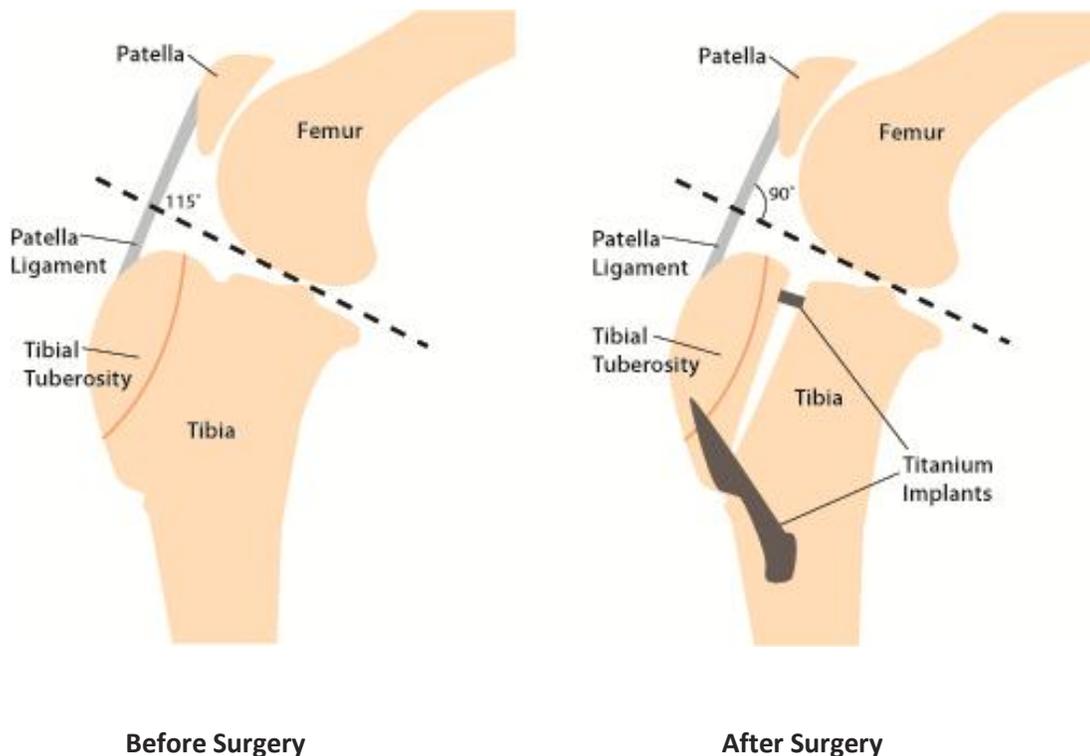
Prognosis after surgery depends on several factors. Obese dogs tend to recover more slowly than dogs in good athletic condition. The longer the interval between injury to the knee and surgery, the more guarded the prognosis. This is due to scar tissue formation and arthritis.

Surgical Treatment for Cranial Cruciate Rupture - Tibial Tuberosity Advancement

During weight bearing, the femur slides down the plateau of the tibia (tibial plateau). The cranial cruciate ligament stops this downward movement, resulting in stress as an animal bears weight. This mechanical stress due to this downward movement results in cranial cruciate ligament rupture. The larger the angle that exists between the tibial plateau slope and the patellar tendon, the less stable the knee joint and the more susceptible to cranial cruciate ligament rupture. A more perpendicular angle results in a more stable joint and eliminates abnormal sliding movement within the knee joint.

Tibial Tuberosity Advancement surgery involves cutting the tibial tuberosity (tibial tuberosity osteotomy) and advancing it to achieve a perpendicular (90 degrees) angle between the tibial plateau slope and the patellar tendon. This relationship results in a stable joint and eliminates the abnormal sliding movement within the knee joint. We feel that TTA surgery is the best method available for stabilizing a dog's knee.

The advanced tibial tuberosity is secured to the tibia using titanium implants. Bone graft is collected from the top of the tibia and packed in the open area of the osteotomy. Healing takes about 8 weeks and Implants do not need to be removed.



Benefits of Tibial Tuberosity Advancement Surgery

- Consistently good results from TTA Surgery
- Post-surgical injuries are less frequent than with other techniques
- Usage of the leg returns more quickly than with other techniques
- Best chance to return to full activity

Questions and Answers about TTA Surgery

- How long will my pet stay in the hospital?

You dogs may be discharged the day after surgery; however, this decision is based on how comfortable and ready your pet is to go home.

- How likely will my dog develop a cruciate ligament rupture on the opposite leg?

Approximately 50% of dogs rupture the opposite leg within 1 year of the original injury. However, surgery on one leg does not have a negative effect on the opposite leg.

- How much pain will my dog be in after the surgery?

Pain resulting from TTA surgery is minimal; however, we are very mindful of your pet's pain. All dogs receive pre-operative, operative and post-operative pain medication and a thorough pain management protocol upon discharge.

- What is involved after the surgery and how long does it take for my dog to recover?

The incision should be monitored daily until the sutures are removed. Exercise needs to be restricted, and your dog should be leash-walked only for 8 weeks. Playing with other pets, jumping and running should be avoided. At 8 weeks post-surgery, x-rays will be taken. If healing is complete, your dog can slowly return to normal activity.