Veterinary Surgical Center of Portland

Amelia Simpson, DVM
Diplomate, American College of Veterinary Surgeons

Susanne K. Lauer, Dr. med. vet.
Diplomate, American and European College of Veterinary Surgeons
Diplomate, American College of Veterinary Sports Medicine and Rehabilitation

Timothy Munjar, DVM
Diplomate, American College of Veterinary Surgeons

10245 SW Park Way
Portland, OR 97225
Phone: 503-292-0931
Fax: 503-296-0748

Information for Pet owners
Cranial Cruciate Ligament Disease

What is the cranial cruciate ligament (CCL)? In people, the CCL is called the anterior cruciate ligament (ACL). The CCL is located within the stifle (knee) and is an important stabilizer of the joint. (Figure 1) When the CCL tears, the tibia (bone below the knee) will inadvertently move forward while your dog is walking.

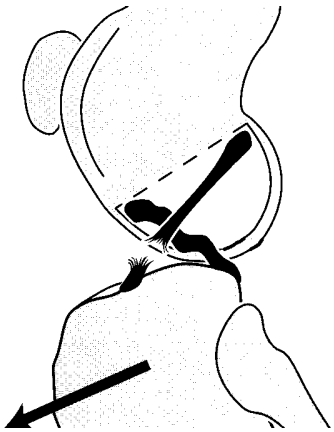

Figure 1: Side view of the stifle joint of the dog with a ruptured cranial cruciate ligament

What causes the disease? Proposed underlying causes for CCL disease include age related deterioration to the ligament structure, obesity, conformation abnormalities (straight rear limb conformation), hormonal, genetic and immune mediated factors. Acute tears as seen with football players are rare, although many owners describe that their dog became suddenly lame after playing Frisbee, jumping out of the car or after other high impact activities. Nevertheless, most of the time the ligament has been pre-damaged and weakened prior to the incident.

Are certain breeds or sex predisposed? Either sex and any age or breed of dog may be affected. However, the incidence is higher in female dogs and many large breeds are considered predisposed to develop CCL tears in both stifles throughout their life. Mean age upon onset of injury is 5-7 yrs, but CCL disease can be observed in dogs less than 1 year of age. Small breed dogs (<33lbs) are generally older upon disease onset. CCL injury is rare in cats. Predisposed breeds include: Akita, Saint Bernard, Rottweiler, Mastiff, Newfoundland, Labrador retriever, Chesapeake Bay retriever, American Staffordshire terrier

How will my dog act if he/she has torn a CCL? Symptoms vary and range from acute non-weight-bearing lameness to chronic mild intermittent limping. Some dogs will not flex their stifle completely and position it to the side when they are sitting or laying down. If CCL disease is chronic, you will see deterioration in the thigh muscles due to decreased use of the limb. Frequently lameness becomes worse after heavy exercise and improves with use of non-steroidal anti-inflammatory drugs (Rimadyl, Deramaxx, Previcox, or Metacam). Approximately one third of afflicted dogs are lame in both hind limbs.

When should I seek veterinary surgical advice? Anytime your dog displays lameness or pain for greater than one week or is non-responsive to conservative treatment of rest and anti-inflammatory drugs, he/she should be examined by a veterinarian. If surgical correction is recommended, your regular veterinarian may want to refer you to a surgical specialist.

Which tests are used to diagnose CCL disease? A CCL rupture is usually diagnosed on physical and orthopedic exam. Joint effusion (fluid accumulation in the joint), fibrosis, muscle atrophy, decreased range of motion, popping (crepitus) or meniscal clicking of the stifle upon joint manipulation are all signs of CCL injury. A positive cranial drawer movement or cranial tibial thrust is diagnostic of the disease, however with partial ligament tears, early instability may be difficult to detect. Radiographs (x-rays) are usually taken to confirm the disease, and to rule out concurrent disease conditions such as cancer (Figure 2). Joint fluid evaluation and/or blood work are occasionally performed to rule out other inflammatory diseases or cancer.

Figure 2. A lateral radiograph of a stifle joint with effusion and osteoarthritis secondary to a CCL tear.

Common complications of CCL injury include:

- osteoarthritis (degenerative joint disease)
- meniscal tears
- loss of range of motion in the stifle
- muscle atrophy of the affected limb
- loss of athletic ability and full function of the affected limb
- rupture of the opposite cranial cruciate ligament

What is the treatment for CCL disease? CCL disease can be managed with conservative (often called "medical") or surgical treatment.

Conservative treatment usually entails controlled exercise, medications to decrease inflammation (non-steroidal anti-inflammatory drugs), pain medications, and weight loss in overweight pets. Once the majority of pain and inflammation is resolved, then a conservative regime of exercise and weight loss (if necessary) should be initiated. Conservative therapy of CCL is best tolerated in patients weighing less than 33lbs and may result in adequate improvement. A recent study showed that overweight large breed dogs can improve quite a bit with weight loss and physical rehabilitation (including swimming). However, conservative treatment does not "cure/correct" the disease but manages the symptoms.

Surgical treatment of CCL injury is divided into two categories: extracapsular (outside of the joint) and intracapsular (inside the joint). The surgical treatment chosen is largely a matter of surgeon's preference. Several retrospective studies have shown that the success rate of any technique is near 90%. The tibial plateau leveling osteotomy (TPLO) was developed in Oregon by Dr. Barclay Slocum over 20 years ago. It is the most widely used and studied surgical technique and the preferred procedure at VSCP. In limited circumstances we will also perform extracapsular stabilization with suture material. Overall, dogs that have had a TPLO have been shown to do better than dogs with extracapsular suture stabilization and are less lame over a longer time.

We also offer minimal invasive arthroscopy with our TPLO surgeries. By placing a small camera in the joint we can perform a detailed inspection of all of the soft tissue that we are unable to visualize on radiographs. This allows us to diagnosis other stifle injuries like meniscus tears, OCD, osteoarthritis, etc. and to provide treatment prior to completing the TPLO. The advantages of arthroscopy include minimizing injury to the joint capsule, decreased pain and to speed up recovery time.

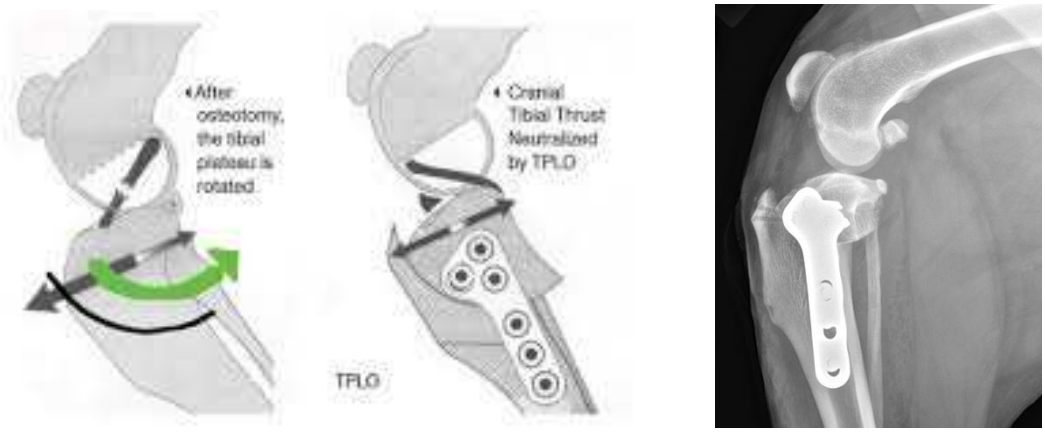

Figure 3: Tibial plateau leveling osteotomy (TPLO) for treatment of a CCL tear

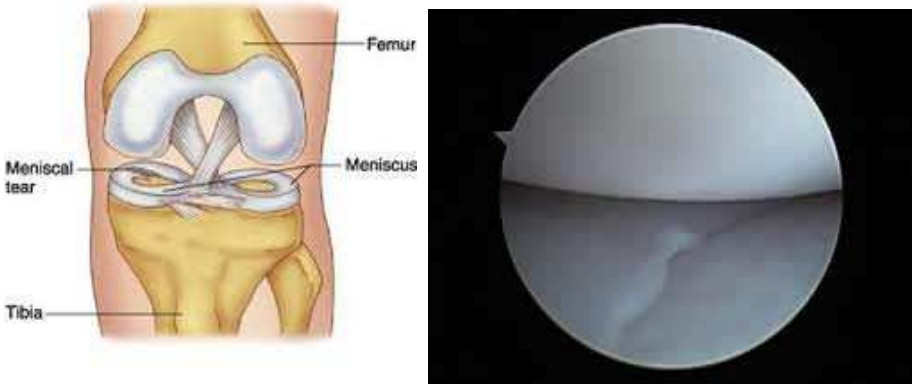

Figure 4: Arthroscopy for minimal invasive treatmnet for meniscal tears in dogs with CCL tears

Can there be complications after surgical treatment? Complications following TPLO surgery are rare. The most common complications include infection at the surgical site, implant failure, fracture, patellar luxation, and failure to return to full function. Seven to thirteen percent of the patients repaired via an extracapsular technique may represent with meniscal injury at a later date. Additionly 40-60% of predisposed dogs will rupture the opposite CCL within one to two years following the initial presentation for lameness.

What type of aftercare is required post-operatively? Your dog will stay overnight after the procedure. A supportive bandage is sometimes applied for the first 12-24 hours. During their stay your pet will be transitioned from intravenous pain management to oral medications. We will ice the surgical area every 4 hours and will ensure that your pet is ambulatory with minimal assistance. When he/she goes home, the incision might still be covered with a small bandaid that will be removed in the next 24-48 hours. Supervised rehabilitation of the knee should start within 48 hours and should include a regime of passive range of motion exercises, cold and hot-packing, balance exercises, and slow walks on leash.

Most dogs need to be separated from other pets and are strictly rested in a crate or small room for a minimum of 6-8 weeks. Only short leash walks are allowed. We will see your pet back in 10-14 days for suture removal and evaluation. At that time we will discuss a gradual increase in walk times. We will take a radiograph at the 6-8 week mark to evaluate bone healing, the plate site, and to discuss further rehabilitation strategies.

Swimming is also an excellent non-weight bearing activity, once the incision is healed we may recommend enrollment in a physical therapy program for dogs. All therapies should first be cleared through your veterinary surgeon, prior to their implementation.

Will my dog return to "normal" after surgery? Long term prognosis for patients with repaired CCL is good, with clinical reports of improvement in 85-90% of the cases. Frequently, canine athletes can return to full (100%) function with an intensive rehabilitation plan. However, we know that degenerative joint disease (osteoarthritis) progresses regardless of treatment in dogs with CCL disease. Maintaining an ideal body weight and an exercise regime of daily moderate activity is recommended to minimize clinical signs.

Literature:

Client information is based on a brochure by the American College of Veterinary Surgeons (www.acvs.org) and the current peer reviewed literature.