

Things to remember about your dog's cruciate problem

1. Your dog has, or will develop, arthritis associated with the cruciate ligament problem – this will not be cured with surgery or medications so we will need to manage this for the rest of your dog's life
2. What you do after surgery is more important than what is done in the operating room – you need to commit to all of the instructions in your discharge summary in order to optimize your dog's outcome
3. In dogs with one cruciate problem, there is a 50-70% chance that the other knee will have the same problem within weeks to years of the first one
4. After surgery, complications or subsequent problems can occur – each procedure has varying complication rates ranging from less than 10% to over 50% depending on many factors – the overall complication rate for TightRope CCL is currently 18.6% with 9.5% requiring further treatment – these include:
 - Infection – 4.6%
 - Instability – 2.7%
 - Meniscal tears – 2.2%
5. The very best things you can do to minimize the chances and effects associated with 1-4 are:
 - Keep your dog at an ideal weight
 - Follow the discharge instructions exactly
 - Keep your follow-up appointments
 - Continue wellness care with your regular veterinarian

References:

1. Elkins AD, Pechman R, Kearney MT, et al.: "A Retrospective Study Evaluating the Degree of Degenerative Joint Disease in the Stifle of Dogs Following Surgical Repair of Anterior Cruciate Ligament Rupture." *J Am Anim Hosp Assoc* 1991; 27: 533-540.
2. Innes JF, Bacon D, Lynch C et al.: "Long-Term Outcome of Surgery for Dogs with Cranial Cruciate Ligament Deficiency." *Vet Rec* 2000; 147: 325-328.
3. Johnson JA, Austin C, Breur GJ: "Incidence of Canine Appendicular Musculoskeletal Disorders in 16 Veterinary Teaching Hospitals from 1980 to 1989." *Vet Comp Orthop Traumatol* 1994; 7: 56-59.
4. Johnson, JM, Johnson, LA: "Cranial Cruciate Ligament Rupture *Vet Clin of North Am: Small Anim Prac.*" 1993, 23, 717-733.
5. Whitehair, JG, Vasseur, PB, Willits, NH: "Epidemiology of Cranial Cruciate Ligament Rupture in Dogs." *JAVMA.* 1993, 203, 1016-D 1019.
6. Duval, JM, Budsberg, SC, Flo, GL, Sammarco, JL: "Breed, Sex, and Body Weight as Risk Factors for Rupture of the Cranial Cruciate Ligament in Young Dogs." *JAVMA.* 1999, 215, 811-814.

TightRope® CCL

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What is cranial cruciate ligament disease?

The cranial cruciate ligament (CCL) is one of the main stabilizing structures of the knee (stifle) joint in the hindlimbs of dogs. The CCL is a rope-like structure inside the joint that acts as a static (constant) stabilizer of the knee, preventing abnormal “slipping” of the two bones of the knee joint, the femur and tibia. Its main job is to hold the femur and tibia in proper alignment during all forms of activity.

Deficiency of the CCL is the most common orthopaedic problem in dogs and inevitably results in degenerative joint disease (arthritis) in the knee joint¹⁻³. It is referred to as a disease because it is typically the result of a degenerative process in dogs, rather than from athletic injury or trauma.⁴⁻⁶ Although it is often noticed after running, playing, or jumping, the disease process has been present for weeks to months when symptoms occur.

What are the symptoms of CCL disease?

Some of the symptoms your pet may display are:

- Limping
- Holding the hindlimb up
- Sitting with the leg stuck out to the side
- Stiffness, especially after exercise
- Not wanting to play or exercise
- Pain when the joint is touched or moved
- Swelling of the joint
- Clicking sound when walking

How is CCL disease diagnosed?

Your veterinarian should review your dog’s medical history and perform a complete examination using tests of the integrity of the CCL including the “cranial drawer” and “tibial thrust” tests. X-rays should be performed to assess the amount of arthritis present and aid in determining treatment options. Sedation or anesthesia is necessary for making the definitive diagnosis to avoid causing pain to your pet.

What are my treatment options?

First, it is important to know that there is **no cure** for CCL disease in dogs. The goals for all treatments are to relieve pain, improve function, and slow down the arthritis. With these realistic goals in mind, a number of treatment options can be very successful in accomplishing all of them.

Non-surgical treatment entails rest and non-steroidal anti-inflammatory medication for 6-8 weeks. Once the initial pain and inflammation have subsided, then a strength-building exercise program and weight loss (if necessary) should be initiated. Nonsurgical treatment of CCL disease can be successful at accomplishing our goals, however, the success rate for accomplishing all of our treatment goals is not high and typically only small dogs weighing less than 30 lbs may have good long-term results with this approach.

Surgical treatment options are numerous and no treatment has been proven to be better than others. It is vital to remember that complete assessment of the joint with treatment of damaged tissues such as the CCL and meniscus, as well as exceptional postoperative management and rehabilitation programs are as, or even more, important than the “CCL surgery” itself. The decision should be based on the best available data on safety and success and the surgeon’s experience with the techniques, and individualized for each patient using the information from the exam and discussion with you regarding your goals and concerns.

Most Common CCL Surgery Techniques:

Tibial Plateau Leveling Osteotomy (TPLO) is one of the “bone-cutting” techniques and is designed to change the anatomy of the knee so that it no longer “slips” without having to try to replace the function of the CCL. A semicircular cut is made at the top of the tibia with a curved saw so that the tibial joint surface is “leveled out” to prevent forward slipping of the joint. A plate and screws are applied to stabilize the cut bone during healing.

Tibial Tuberosity Advancement (TTA) is the other “bone cutting” technique which is designed to change the knee anatomy so that muscle forces are rebalanced to limit the tibia from “slipping” forward. In this procedure, the bony attachment of the quadriceps muscles is cut, moved forward, and held in place with a spacer, plate, and screws during healing.

Lateral Suture Stabilization is the most common technique used to treat CCL disease in dogs. It is one of the “extracapsular” techniques which means the function of the CCL, which is inside the joint, is replaced by placing a suture outside the joint. The suture, most commonly a type of medical grade “fishing line,” is placed around the fabella and through the tibia providing a soft tissue-to-bone stabilizer of the joint during healing. The suture acts as a temporary stabilizer as the dog makes new functional scar tissue around the knee for long term joint stability.

TightRope CCL was developed two years ago to provide a minimally invasive and improved method for extracapsular stabilization of the CCL. This technique does not require cutting of bone like the TPLO or TTA procedures, but instead uses small drill holes in the femur and tibia to pass a synthetic ligament-like biomaterial through a small incision to provide bone-to-bone stabilization during healing. The biomaterial used for the TightRope CCL is called FiberTape. This is a kevlar-like material that is used extensively in human surgery for many orthopaedic applications. This material has properties that make it stronger and less prone to failure than any other suture materials currently being used for CCL reconstructions.

