

Cranial Cruciate Ligament Tear – Lateral Imbrication Technique

Anatomy



The canine knee joint, known as the stifle joint, is similar to a human's knee in many regards. The joint is made up of the femur (thigh bone), tibia (shin bone), and the patella (kneecap) that are firmly held together by ligaments. Ligaments are strong, dense structures consisting of connective tissue that connect the ends of two bones across a joint. The function of ligaments is to stabilize the joint.

The stifle has two very important ligaments called the cranial cruciate ligament (CrCL), labeled C in the illustration right, and caudal cruciate ligament. Cruciate means a cross or crucifix, and these two ligaments that cross over each other in the center of the joint. The CrCL (known as the ACL in humans) restrains the backward and forward motion of the joint, in addition to inward twisting and hyperextension of the joint. It is the structure that is most commonly injured in dogs. In fact, more than 600,000 dogs in the U.S. have surgery for this problem every year.

The stifle also has two half-moon shaped cartilage structures between the weight-bearing bone ends called menisci. There are two menisci in each stifle, one on the inner side of the joint called the medial meniscus and one on the outer side of the joint called the lateral meniscus. The menisci add support to the stifle and also serve as shock absorbers by spreading the weight load across the joint. In the illustration left, the medial meniscus has a bucket-handle tear (see arrow) which need to be trimmed at the time of the surgery.



Effects of CrCL tear

The top of the tibia bone, called the tibial plateau is angled downward. When the CrCL is torn, weight-bearing forces causes the femur bone to slide down this slope. Not only is this painful, but also causes the stifle to shift out of place during weight-bearing movement. As the femur slides down the tibial plateau, the meniscal cartilage—a cushion between the bones that acts as a shock absorber may be crushed. In about 50% of the dogs with CrCL injuries, the meniscal cartilage has been injured as well. This type of injury is often accompanied by a “click” that can be heard when a dog walks. When the CrCL is weakened or torn, the most significant long-term change in the joint is the development of arthritis.

Clinical signs and diagnosis

Most dogs with a complete CrCL tear show an immediate onset of lameness. While there may be some initial improvement over several days, there usually is a dramatic decline in limb function over time. Dogs that have a partial CrCL tear may have persistent lameness on the affected limb, yet others have stiffness or lameness on the limb after taking a nap or while exercising. Your veterinarian may detect swelling in the knee and instability in the stifle upon examination of the joint. Dogs that have a partially torn CrCL may not have any detectable instability of the joint and x-rays of the joint may be needed to support the diagnosis.

The day of surgery

Our anesthesia and surgical team will prescribe a pain management program, both during and after surgery that will keep your companion comfortable. This will include a combination of general anesthesia, injectable analgesics, long-lasting local anesthesia (Nocita), oral analgesics and anti-inflammatories.

Treatment

The lateral fabellar technique is primarily recommended for small dogs and cats. Although this technique can be used to treat cranial cruciate rupture in large breed dogs, they have a greater risk of loosening the bands and a poorer outcome.

The initial part of the surgery is joint “house keeping”. This involves removal of remnants of the torn cruciate ligament and inspection of the joint for other problems. If the meniscus cartilage is torn, the damaged part of the cartilage structure is removed.

Two very strong sutures are passed around the small bone called the lateral fabella located on the backside of the knee and then through a hole drilled in the top of the tibia bone. These sutures are placed in the same orientation as the cranial cruciate ligament; therefore the instability of the knee is eliminated. During the healing process, scar tissue develops on the side of the joint, which permanently keeps the knee stable. Restriction of activity is therefore important so that the strong sutures do not prematurely loosen before the scar tissue has developed.



Home care

After surgery, you can continue to give your pet a prescribed pain reliever to minimize discomfort. It's also extremely important to limit your dog's activity and exercise level during this post-operative period. Rehabilitation exercises can be done at your home and by professionally trained therapists at an animal rehabilitation center. Rehabilitation therapy should be continued until your dog is bearing weight well on the operated limb (typically 8 weeks after surgery). The surgeon will monitor the healing process with two follow-up exams. The first is scheduled at two weeks after the surgery and the second is at eight weeks after the surgery. By 3 to 4 months after surgery, most dogs are fully weight-bearing on the operated limb, although exercise should be limited during the first three months after the procedure.

Results

Generally, most small dogs and cats respond well to the imbrication surgery, with resolution of lameness after the healing process is complete. Arthritis will develop in the knee of dogs that have a cruciate ligament tear with time in spite of having surgery. Some dogs do not exhibit significant clinical signs of the arthritic changes in the knee, yet others show clinical signs of arthritis such as stiffness and lameness associated with heavy activity. Medication is available, should your companion experience signs of arthritis.

Assessment and recommendations

Patient: _____ Date: _____

Treatment

- Your companion has a cranial cruciate ligament rupture
- Surgery should be performed
- No surgery is needed

The following has been prescribed

- No medications or diet are necessary at this time
- Prescription joint diet: _____
- Neuroceutical: _____
- Nonsteroidal anti-inflammatory medication: _____
- Other medication: _____

Exercise

- Unlimited
- Confine your pet to the house other than very short leash walks necessary for bowel movements and urination
- Restrict exercise to leash walks 10 minutes twice daily

Preparation for surgery

- Start fasting your companion at midnight before surgery; water should not be withheld
- Pepcid AC 10 mg tablets: give _____ tablets with water (use a syringe if needed) at 6 AM on the day of surgery

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