

Cranial Cruciate Ligament Tears in Immature Dogs

Anatomy

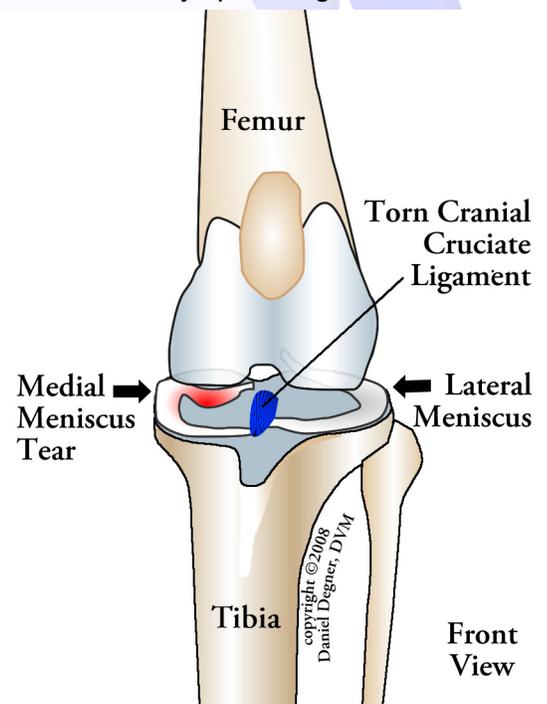
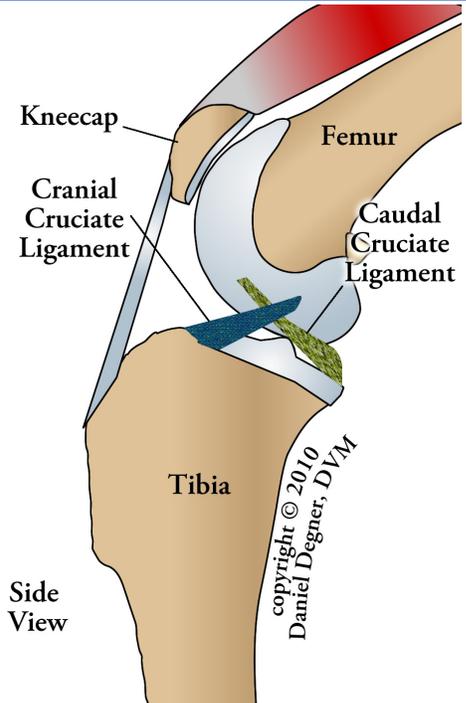
The canine knee joint, known as the stifle joint, is similar to a human's knee in many regards. The joint is made up of the femur (thigh bone), tibia (shin bone), and the patella (kneecap) that are firmly held together by ligaments. Ligaments are strong, dense structures consisting of connective tissue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

The stifle has two very important ligaments called the cranial (CrCL) and caudal (CaCL) cruciate ligaments (cruciate means a cross or crucifix) that cross 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. CrCL 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 the 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.

Effects of CrCL tear

The top of the tibia bone, called the tibial plateau is angled downward. When the CCL 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

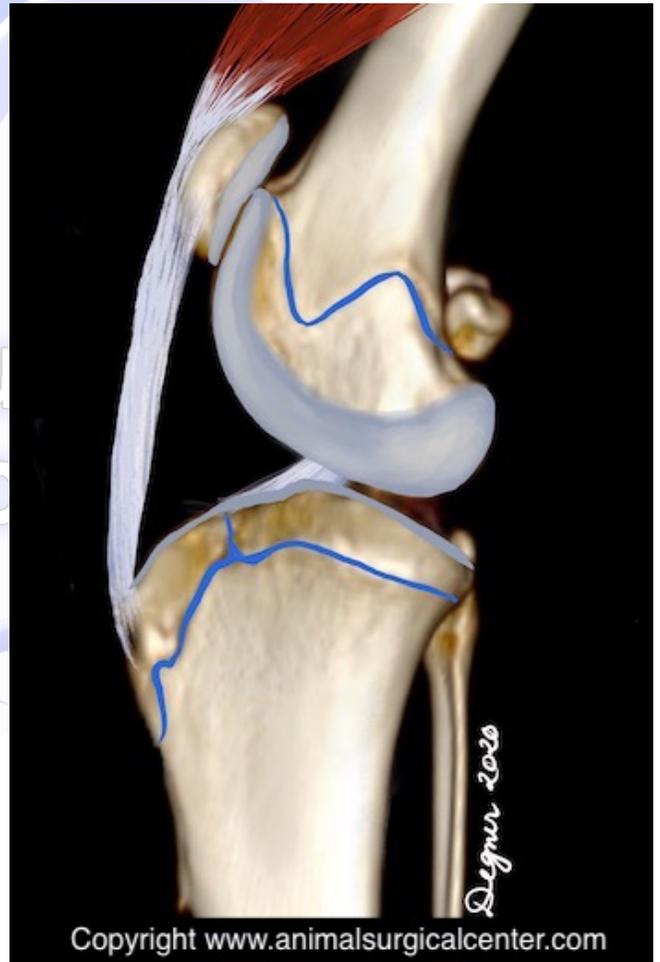
Our anesthesia and surgical team will prescribe a pain management program, both during and after surgery that will keep your companion comfortable. This may include a combination of general anesthesia, injectable narcotics and long-lasting local anesthetics.

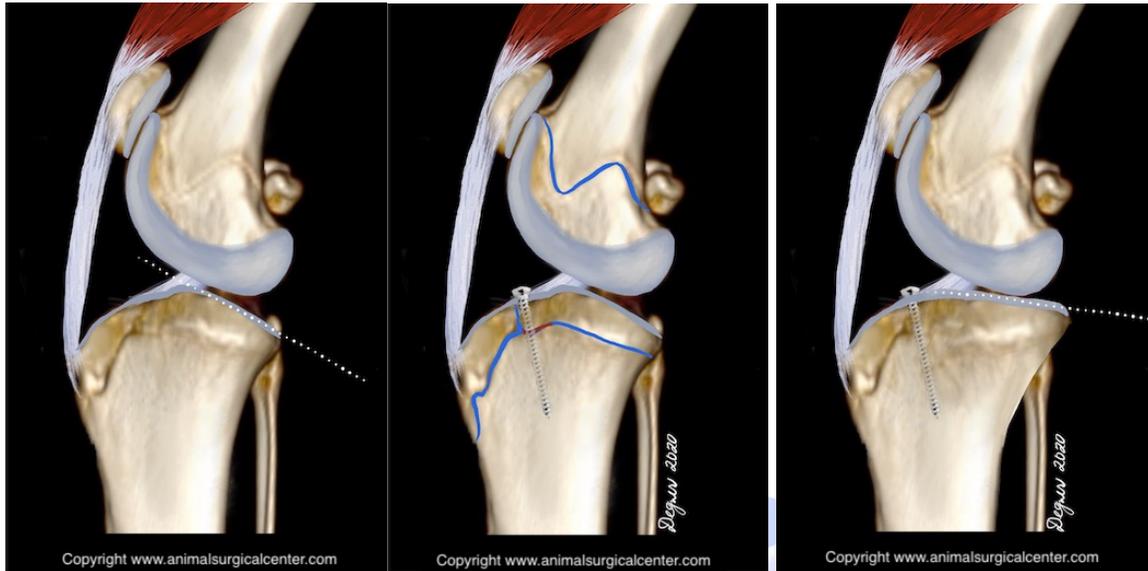
Very young dogs and cruciate injury

One of the challenges that the orthopedist faces is rupture of the cranial cruciate ligament in very young dogs (6 months or less). As mentioned above, arthritic changes progress rapidly with the traditional techniques that have been used in the past. As a result, this is not an ideal treatment. The standard TPLO is also not ideal for very young dogs either, as the growth plate is cut during the procedure, which may result in deformity of the bone as the dog grows. The illustration here shows the location of the growth plates of the tibia and femur bones (blue lines).

Dynamic tibial plateau leveling procedure

The dynamic tibial plateau leveling procedure (TPLP), can be used to treat cranial cruciate ligament rupture in growing immature dogs. The timing of the surgery is critical, and is specific to the breed of dog. This technique involves placing a screw in the cranial aspect of the growth plate of the tibial plateau. Growth is stopped at this region of the tibial plateau, yet the caudal aspect continues to grow. Over time the tibial plateau angle is leveled. The amount of leveling of the plateau is dependent on the preoperative tibial slope and the age of the dog at which the procedure is performed.





Home care and results

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 or if you choose, by professionally trained therapists at an animal rehabilitation center. Rehabilitation therapy should be continued until your dog is using the operated limb well (typically 6 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 the lameness should resolve.

The TPLP procedure offer multiple benefits in comparison to older techniques which include: faster recovery, earlier use of the limb after surgery, better chance to return to athletic activity, and better range of motion of the joint. The TPLP procedure is currently the best method available for stabilizing a dog's knee. With good rehabilitation, 90% of dogs undergoing this surgery can expect to return to athletic activity within five months.

Assessment and recommendations

Patient: _____ Date: _____

- Your companion has a cranial cruciate ligament rupture
- Surgery is recommended
- No surgery is needed

The following has been prescribed

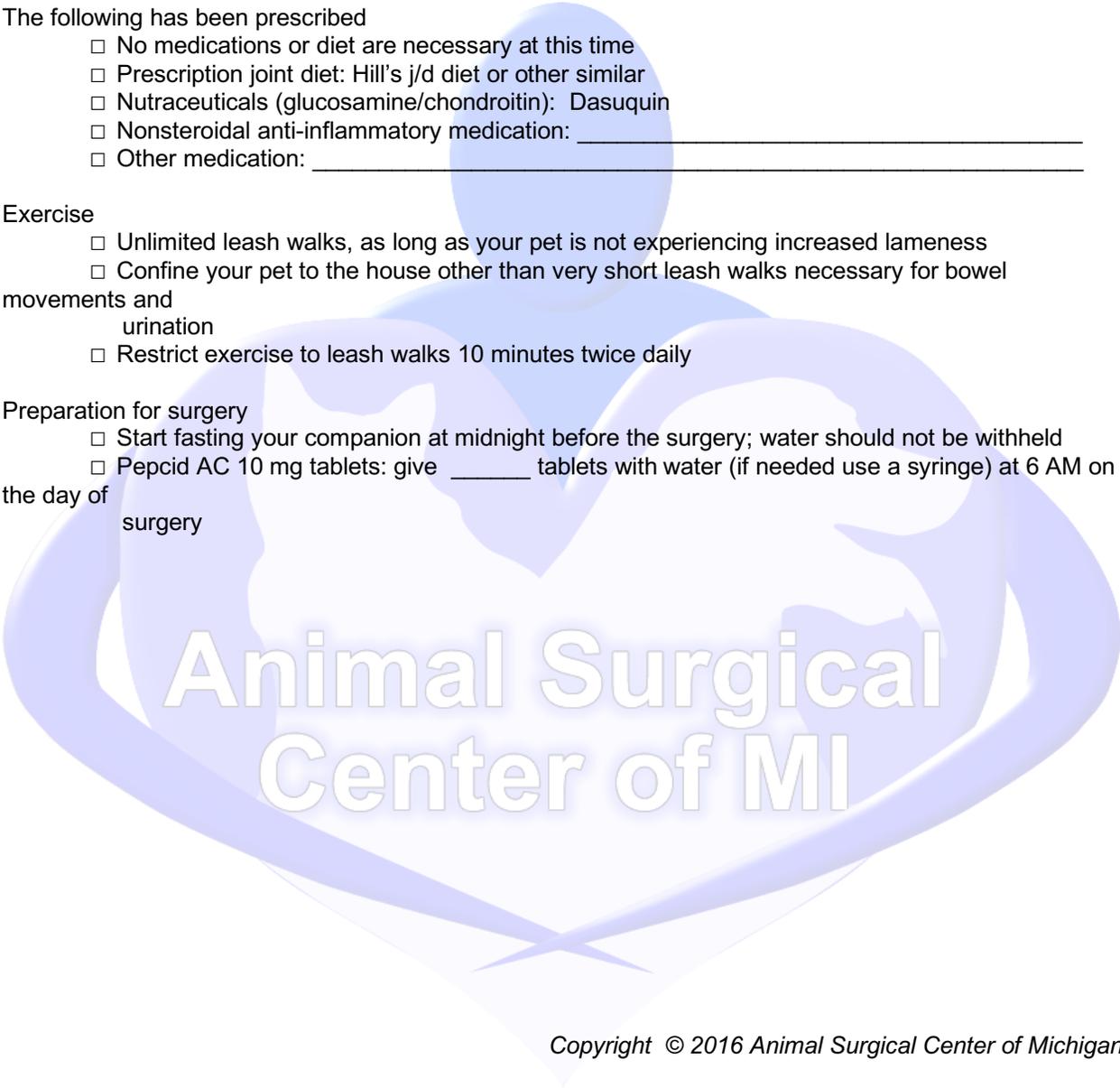
- No medications or diet are necessary at this time
- Prescription joint diet: Hill's j/d diet or other similar
- Nutraceuticals (glucosamine/chondroitin): Dasuquin
- Nonsteroidal anti-inflammatory medication: _____
- Other medication: _____

Exercise

- Unlimited leash walks, as long as your pet is not experiencing increased lameness
- 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 the surgery; water should not be withheld
- Pepcid AC 10 mg tablets: give _____ tablets with water (if needed use a syringe) at 6 AM on the day of surgery



Animal Surgical
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