



Anterior Cruciate Ligament Rupture

The "Athletic" Rear Limb Lameness Injury

The most common cause of rear limb lameness in the dog is rupture of the anterior cruciate ligament (Figures 1a and 1b). This injury allows degenerative changes to occur in the stifle (knee) joint, which must be limited before permanent cartilage and bony changes occur and result in irreversible arthritis.

The stifle is a hinge joint that allows a wide range of motion of the tibia on the femur. To maintain stability through this range of motion there are two cruciate ligaments. These ligaments cross each other (hence the name cruciate) to provide a major role in stifle

stability. The cranial (anterior) cruciate ligament also prevents forward displacement of the tibia on the femur (anterior drawer motion). See Figure 2.

The cranial (anterior) cruciate ligament acts as a constraint against the tibia moving forward on the femur (Figure 3). The most common mechanism for anterior cruciate rupture is sudden rotation of the stifle when the joint is in flexion (i.e., a sudden right turn on the weightbearing right rear pivot limb). The ligament also can rupture when a dog jumps, if his or her knee is hit from the front (as when a

Figure 1a.
Frontal view of normal left stifle

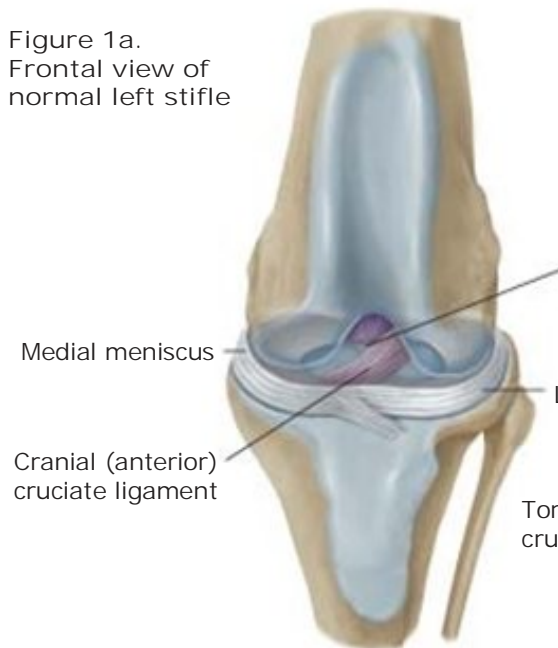
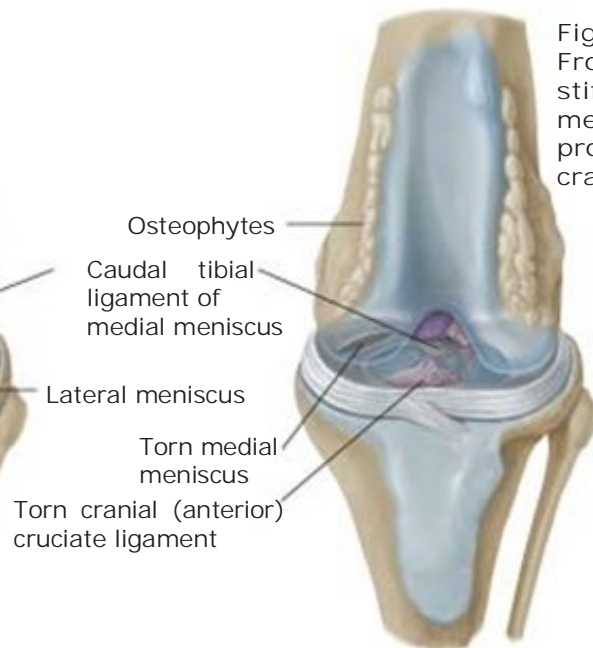


Figure 1b.
Frontal view of left stifle showing torn meniscus, osteophyte production and slight cranial drawer



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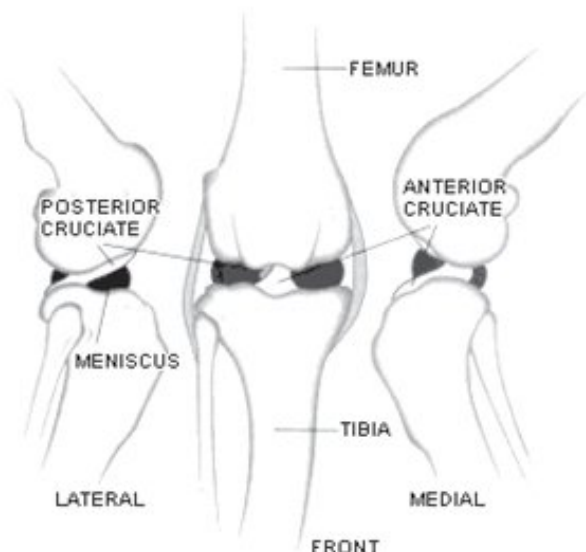


Figure 2. Frontal and side views of stifle joint

football player is hit from the front), or if he or she steps in a hole. Degenerative changes in the stifle joint from obesity, conformational deformities, patellar luxations, or from repeated minor stresses can result in progressive deterioration of the cruciate ligament. When the anterior cruciate ligament ruptures, the compensatory stress placed upon the opposite rear limb may predispose it to ligament rupture. Weight reduction and immediate repair of the damaged leg to minimize the risk to the unaffected limb are therefore of critical importance.

Symptoms

The clinical signs of anterior cruciate rupture can vary depending on the extent and chronicity of the injury. Animals with an acute rupture present with a non weightbearing lameness, joint effusion, palpable pain in the stifle, and joint instability. Those with more chronic injuries generally exhibit an intermittent weightbearing lameness, muscle atrophy, thickening of the joint capsule with palpable bone spurs present, and joint instability with a frequent meniscal click associated with a torn medial meniscus.

Menisci have been described as elastic, movable washers that aid in the lubrication of the joint and also act as shock absorbers. The most common meniscal injury occurs in the medial meniscus and is associated with rupture

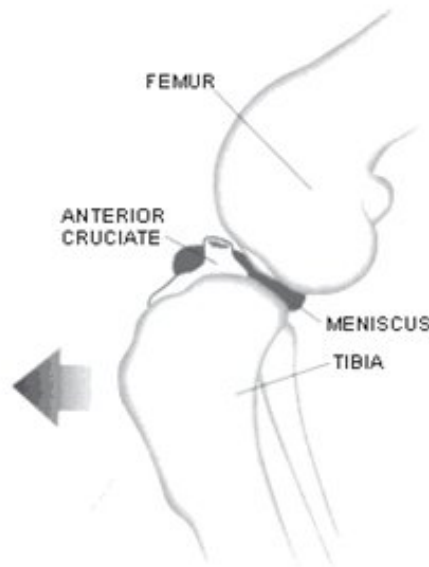


Figure 3. Position of anterior cruciate on tibia

of the anterior cruciate ligament. In some cases, the meniscus is crushed between the femur and the tibia. In others, the meniscus may undergo a longitudinal tear. With this type of lesion, the meniscus may fold itself during the abnormal sliding motion of the unstable joint. This type of lesion frequently exhibits a clicking or snapping sound as the meniscus unfolds (Figure 4).

Treatment

Surgical stabilization of the stifle is recommended for all anterior cruciate ruptures. (If your dog is over forty pounds, please refer to the article entitled Tibial Plateau Leveling Osteotomy on this website for information regarding surgical treatment.) Surgical techniques can be divided into extracapsular or intracapsular. The extracapsular techniques

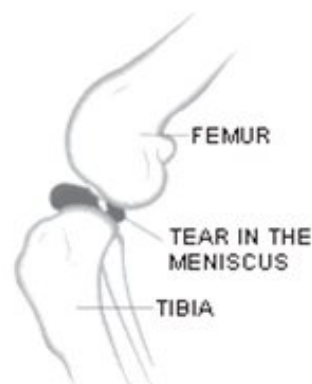


Figure 4. Torn medial meniscus

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alter the tissues outside the joint to tighten and stabilize the knee. They include heavy sutures placed outside of the joint (i.e. modified Flo imbrication technique) and the manipulation of ligaments adjacent to the joint to stabilize the knee (fibular head transposition). Intracapsular techniques generally utilize a graft from an adjacent tissue in the knee to replace the anterior cruciate ligament. In either case, any damaged portion of the meniscus and all remnants of the ruptured cruciate ligament are removed or repaired at the time of corrective surgery (Figure 5).

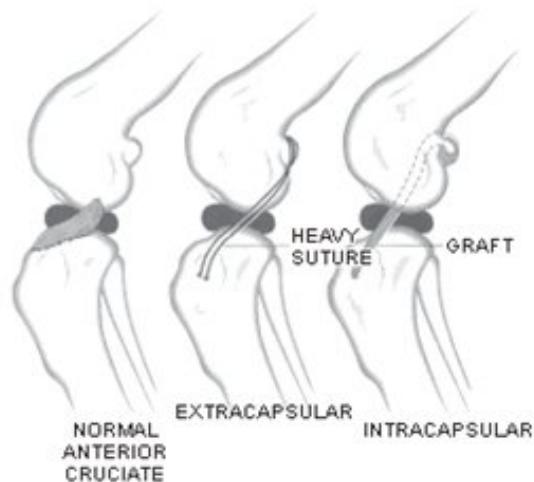


Figure 5. Surgically repaired anterior cruciate

Postoperative Care

Postoperative care is critical to long term success. The most critical element is confinement of the dog to a small area. After surgery, the knee is bandaged in a stable walking configuration for one to two weeks. After that time, the bandage and sutures are removed and passive physical therapy is started at home. This physical therapy requires only a few minutes three to four times daily. Swimming therapy and short walks gradually increasing in length over six to eight weeks will be started several weeks after surgery. Again, complete confinement to a small room, pen, or cage when not working on physical therapy is mandatory. Avoid slick floors, jumping, running, stair climbing, and all acrobatics until recovery is complete.

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Figure 6. Supporting ambulation with a towel

During your pet's convalescence, it may be necessary to offer assistance with ambulation (walking). Two such methods are:

Towel Walking

Place a sheet or large towel under your pet's abdomen as a means of support, holding an end in either hand. Use a towel or sheet that is large enough to enable you to stand in an upright position (Figure 6).

Support your pet so that he/she is unable to bear full weight on the affected limb(s). Over the passage of time (usually two to three weeks), you will notice that your pet will be able to accommodate a greater percentage of its actual weight, requiring less assistance from you.

In the case of a male dog, you will need to re-position the towel/sheet so as not to impede urinary function. This would be done once the dog is outside and ready to urinate. Allow him to lean against you while urinating. This will provide stability for him while urinating.

Tail Walking

You may also assist your dog with ambulation by holding its tail in an upright manner. This serves as a 'rudder' and provides the needed stability for walking.

NOTE: Not all pets will tolerate this method. You will need to decide which method of assistance will be the most effective.

Figure 7. Elizabethan collar



The Use of Elizabethan Collars

Your pet is being discharged with a plastic cone-shaped collar called an Elizabethan or Buster Collar (Figure 7). This collar has been provided for use during the recuperation period and plays an important part in your pet's healing capabilities.

The collar is designed to restrict your pet's ability to reach his/her incision area or bandage(s). Licking at an incision area may result in open wounds (granulomas) that can be difficult to treat. This collar has been provided to protect these areas and also to insure that proper healing is allowed to take place.

Although your pet may exhibit some strange behavior (such as pawing at or rubbing the collar, or walking into stationary objects), after the initial placement of the collar this behavior will usually subside after approximately one to two hours time. Contrary to what one might think, it is not beneficial to remove this collar. To do so only increases the time needed to become accustomed to wearing it.

Be assured that this collar does not constrict breathing passages when worn. The animal will be able to eat, drink, sleep and eliminate while wearing this collar.

Typically, it will only remain in place for the duration of time that the surgical site is sutured or an area is to remain bandaged. We do suggest that once your pet may have this collar removed that you keep it for future use. It may prove to be quite beneficial in the future for aid in treating minor skin irritations, "hot spots," and so forth.

Medicating Your Dog

1. When administering medication in capsule or tablet form to your dog, you may find it much easier to simply place the medication in a small amount of food and offer it as a treat to your pet.
2. If your dog will not accept medication in the above mentioned fashion, it will be necessary for you to manually 'pill' your pet (Figure 8). Place your hand around your pet's upper jaw and gently apply pressure by pressing the lips against the teeth. Using your other hand, gently pull the lower jaw downward and place the medication in the very back of your pet's throat. By holding his/her muzzle and gently stroking the throat, you will stimulate your pet to swallow.



Figure 8. Administering medication to a dog

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