ANTERIOR CRUCIATE LIGAMENT RUPTURE

THE "ATHLETIC" REAR LIMB LAMENESS

The most common cause of rear limb lameness in the dog is rupture of the anterior cruciate ligament. 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 which 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, one anterior (toward the front of the knee) and one posterior. These ligaments cross each other (hence the name cruciate) to provide a major role in stifle stability. The anterior cruciate ligament prevents forward displacement of the tibia on the femur (anterior drawer motion). Fig. 1.

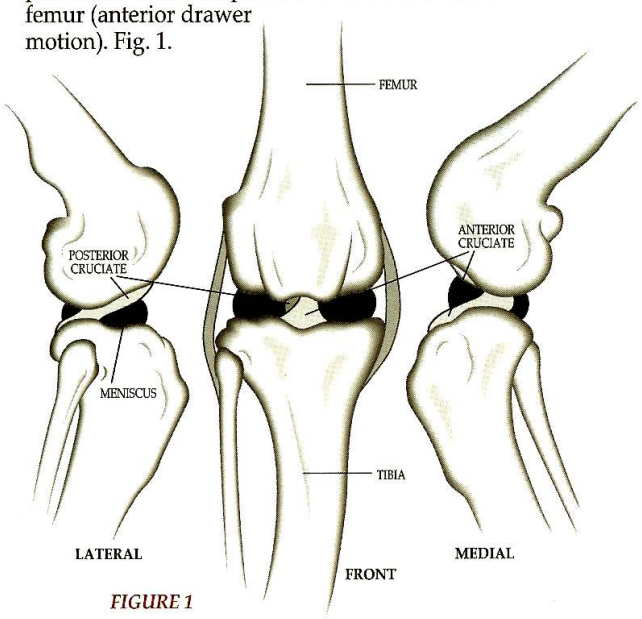


FIGURE 1

The biomechanics of injury to the anterior cruciate ligament coincide with the functions of the ligament, which acts as a constraint against one bone (the tibia) moving forward on the other (the femur). See Fig. 2. The most common mechanism for anterior cruciate rupture comes with sudden rotation of the stifle when the joint is in flexion (i.e.: a sudden right turn on the weight-bearing right rear pivot limb). The ligament also ruptures if the knee is hit from the front (as when a football player is hit from the front or when a dog steps in a hole and catches its foot or when he/she falls forward when jumping). Degenerative changes in the stifle joint from obesity, conformational deformities, such as knocked knees, bowed legs and 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. ***This places critical importance on weight reduction and immediate repair of the damaged leg to minimize the risk to the unaffected limb.***

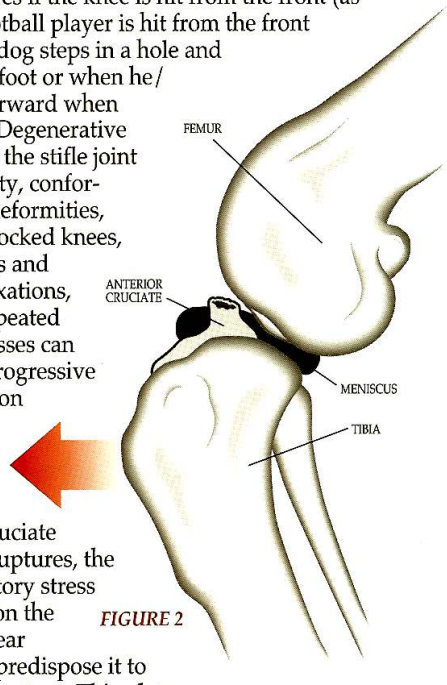


FIGURE 2

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 nonweight-bearing lameness, joint effusion, palpable pain in the stifle, and joint instability. Those with more chronic injuries generally exhibit an intermittent weight-bearing 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.

Although the exact purpose of the meniscii is still unclear, they have been described as elastic, movable

washers which 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 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 on 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. Fig. 3.

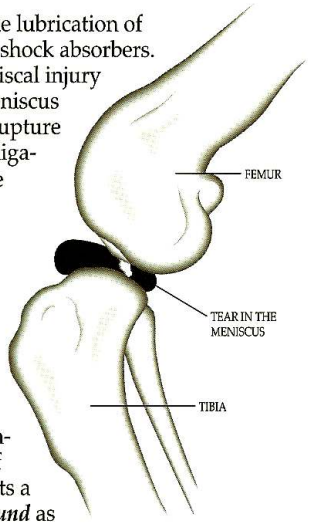


FIGURE 3

TREATMENT

Surgical stabilization of the stifle is recommended for all anterior cruciate ruptures. Surgical techniques can be divided into ***extracapsular*** or ***intracapsular***. The extracapsular techniques alter the tissues outside the joint to tighten and stabilize the knee. They include modified Flo imbrication, fibular head transposition, and complete reconstruction of the knee itself to eliminate the need for the anterior cruciate ligament (TPLO). Intracapsular techniques generally utilize a graft from an adjacent tissue in the knee to replace the anterior cruciate ligament and are located within the joint capsule. In either case, any damaged portion of the meniscus and all remnants of the ruptured cruciate ligament are removed at the time of corrective cruciate surgery. See Fig. 4.

POSTOPERATIVE CARE

Postoperative care is critical to long term success. The most crucial element is confinement to a small area for 6 to 8 weeks. After surgery the knee is bandaged in a stable, walking configuration for 1 week. 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 3 to 4 times daily. Swimming therapy and short walks, gradually increasing in length over an additional 6 to 8 weeks, will begin after healing has occurred. Specific rehabilitation will vary with the size, temperment and age of each pet as well as with the particular technique selected for surgical repair. 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.

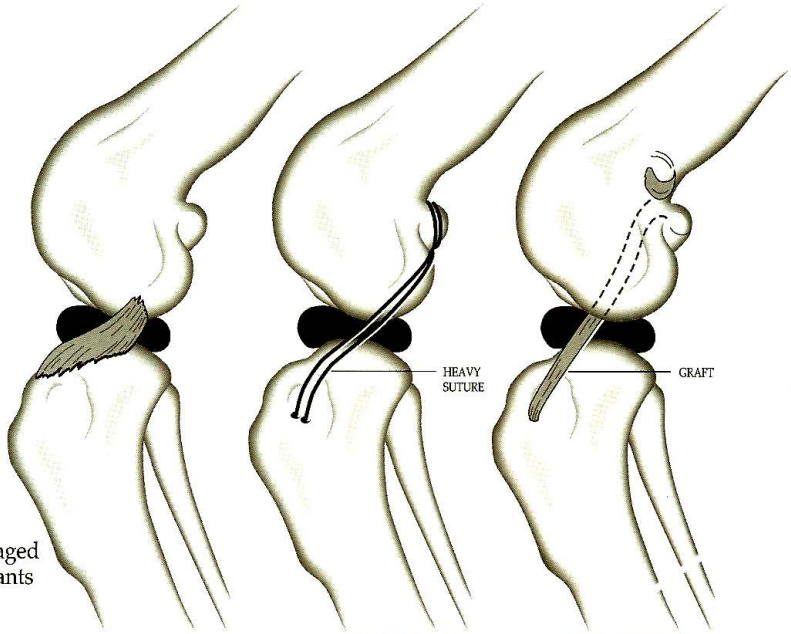


FIGURE 4

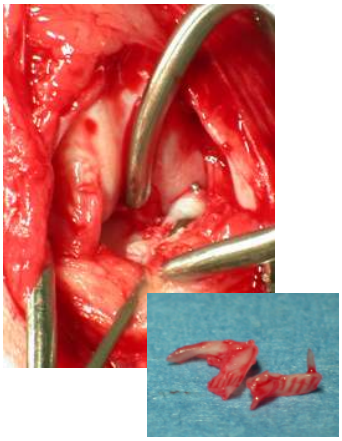
Veterinary Surgical Services
215 Center Park Drive
Knoxville , TN 37922
(865) 966-3920

Operative Report

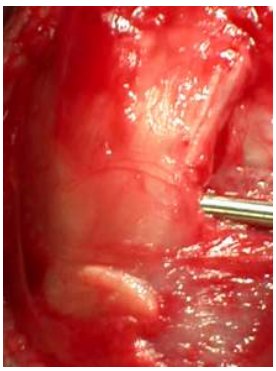
Case Number: 5545
Date: 2006
Referring Veterinarian: Dr. Suzie Sample
Patient Name: Bitsy Sample
Breed: Mix, 40 lbs
Pre Op Dx: Right ACL rupture.

Pre Operative Notes: O declined TPLO. Dog has a positive cranial trust, a positive draw and a meniscal click in right stifle. IV catheter placed right cephalic. Cephalexin 600 mg IV, Rimadyl 1.25 ml sq.

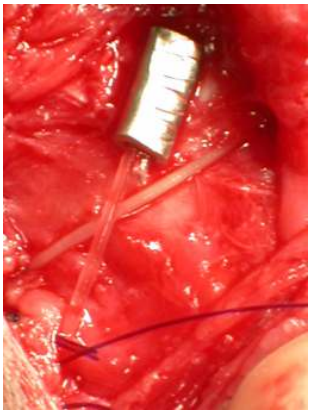
Operation in Detail: The dog was placed in left lateral recumbancy. The right rear leg was shaved and prepped for surgery. A cranio-lateral incision was made in the distal, lateral aspect of the lateral biceps fascia. Blunt dissection was used to separate the femoral biceps fascia from the joint capsule. The joint capsule was incised along the lateral aspect of the patella and stifle joint. The ruptured cruciate ligament was visualized. Noted was the obvious traumatic rupture of the ligament. There was extensive chondromalasia on the articular surface of the medial femoral condyle. The lateral meniscus was wnl. The medial meniscus had a large bucket handle tare. The remnants of the ACL and the debris were removed. The joint was flushed and examined again before closure of the joint capsule. The capsule was closed with 2-0 PDS in a continuous pattern.



A small hole was drilled from lateral to medial through the tibia tuberosity. One 40# monofilament strand was pasted through the hole and inserted under the distal patella ligament from medial to lateral. The sesmoid bone was identified behind the femoral condyle and the suture was then passed around it using a large tapered needle.



The securos tensoner was used to set the tension on the suture. The tension was increased till the draw was gone. Next, the sutures were crimped with the securos 40 lb crimp clamp. Next, the biceps fascia was closed with distal tension placed at the proximal tibia. Closure was with 2- 0 PDS in a continuous pattern. The subcutaneous tissue was closed with 2-0 PDS followed by 3-0 PDS skin sutures. Marcaine was injected locally.



Post Operative Instructions: No running, jumping, or stairs for 3 months. Work back to normal activity slowly. Suture removal in about 10-14 days if desired. Give Cephalexin 500 mg twice daily. If you find that dog is still painful while on the rimadyl, see your regular Veterinarian for additional pain meds or call us and we will call in a prescription for additional meds. For additional information see discharge instructions.

Please call if you have any questions or problems.

Mitch T. Rosenzweig, DVM