

Canine Cranial Cruciate Ligament Rupture

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Key Points (if applicable)

- Pain on extension of stifle, tibial thrust, and cranial drawer
- Help confirm by viewing secondary signs visible on radiographs
- Treatment options include extracapsular repair, TPLO, and TTA
- Will continue to have cranial drawer after TPLO and TTA
- TPLO and TTA eliminate tibial thrust

Overview

Anatomy of cranial cruciate ligament:

- Origin – **medial surface of lateral femoral condyle**
- Insertion – Craniomedial surface of the tibial plateau beneath the intermeniscal ligament

Function:

- **Prevent cranial drawer**
- **Prevent excessive hyperextension**
- **Prevent excessive internal rotation**

Clinical Presentation

- Can occur in almost any breed and any size but very straight-legged dogs seem to be predisposed such as Boxers, German Shepherds, Labradors, Golden Retrievers, Newfoundlands, Mastiff, Akita, etc.
- Age will vary also. Young and old can be affected but more frequently middle aged to older dogs
- Typically acute or chronic lameness which does not improve with rest and may have some mild improvement with NSAID therapy

Diagnosis

Orthopedic Examination:

- May sit with knee rotated outward (positive sit test)
- **Positive cranial drawer** (may not appreciate it if a partial tear present or if animal is fighting palpation)
- Positive tibial compression test (**tibial thrust**)
- **Painful on extension**
- Presence of medial buttress
 - i. This is an accumulation of fibrous tissue that the body deposits in an effort to stabilize the knee
 - ii. This is a good indicator of chronicity
- Palpable joint effusion
- Possible meniscal click if there is concurrent meniscal damage
- Muscle atrophy if chronic

Diagnosis (Continued)

Radiographs:

- Osteophytes typically present, especially along femoral trochlear ridge, tibial plateau, and patella
- **Joint effusion**

Treatment Options

Lateral suture (extracapsular repair):

- Heavy suture placed around fabella on lateral aspect and then through a hole in the tibia. This runs in similar orientation as the original cranial cruciate ligament except your prosthesis is outside the joint (“Extracapsular repair”)
- Usually done on smaller dogs < 20kg
- Can cycle, stretch, and break resulting in instability

Tibial Plateau Leveling Osteotomy:

- Osteotomy is performed at proximal tibia and the tibial plateau is then rotated and then stabilized with a bone plate. This biomechanically changes the leg such that there is more load on the caudal cruciate ligament (which can handle the load) and you eliminate tibial thrust
- You did not fix the cranial cruciate ligament. Therefore, **you will always have cranial drawer**. However, the leg will be dynamically stable and prognosis is excellent

Tibial Tuberosity Transposition:

- Cut along cranial aspect of proximal tibia
- Insert a cage in between the tibia to advance it
- Goal is to make patellar tendon perpendicular to the tibial plateau
- This results in **elimination of tibial thrust** similar to the TPLO
- Newer procedure, but early results are comparable to TPLO thus far

Treatment Remarks:

- Overall, most surgeons consider the TPLO the gold standard for cruciate repair, although this is controversial. These are all considered extracapsular techniques. There are many other procedures that describe cruciate repair, but these are the three most commonly performed.
 - Any repair will result in progression of osteoarthritis. However, it will be slower than not doing anything, and it frequently does not seem to clinically affect the patient as long as there are no complications with the procedure.

Cage Rest:

- This may work with small dogs, but you need to be very strict
- Typically 8-12 weeks
- If owners can't afford surgery, this is what should be recommended. Likely, the patient will not recover as a 'rock star' athlete, particularly if it is a larger dog, but eventually fibrosis will help stabilize the leg. Keep in mind the progression of arthritis will likely be greater compared to surgical repair

