

Tibial Tuberosity Advancement (TTA)

The most common knee injury and the most common orthopedic lameness in the dog, is the rupture of the Cranial Cruciate Ligament (CCL). It is also commonly referred to as the Anterior Cruciate Ligament (ACL), which is the term used in human medicine. This injury can occur at any age and in any breed, but does occur most commonly in middle-aged, overweight, medium to large breed dogs. Surgical repair of cranial cruciate deficiency is one of the most common small animal orthopedic procedures, due not only to the high incidence of the problem, but also to the clinical success of recent surgical techniques.

Signs of a Cranial Cruciate Ligament rupture include:

- *Sudden lameness on one rear limb. This often occurs when jumping or playing, and there is excessive internal rotation of the knee while it is in extension. This would be like an athletic injury.

- *A history of mild lameness in the same limb that seems to come and go before a sudden worsening of symptoms. This is often a partial tear of the ligament that progressed to a full tear. This is often secondary to genetic conformational abnormalities, obesity, age and chronic degenerative joint disease.

Tearing of the Cranial Cruciate Ligament results in instability of the knee termed “cranial tibial thrust”. Every time the pet bears weight on the affected leg, the femur slides down the tibial plateau with nothing to halt it’s movement. This sliding action damages a cartilage structure in the joint called the meniscus. Once the meniscus is torn, arthritic change accelerates and pain worsens.

A ruptured CCL can only be corrected by surgery and there are several surgical corrections currently being performed. The most common are: 1) External Capsular Repair and it’s variation, the Tight

Rope Procedure. 2) Tibial Plateau Leveling Osteotomy (TPLO), and 3) Tibial Tuberosity Advancement (TTA). The TPLO and the TTA are both considered the “State of the Art,” and are the two procedures most compared and contrasted.

Benefits of the TTA

- 1) TTA neutralizes cranial tibial thrust in CCL deficient stifles.
- 2) Stability is achieved without compromising joint congruency.
- 3) TTA decreases internal joint reactions including retro-patellar pressure.
- 4) TTA is less invasive than other geometry modifying techniques.
- 5) TTA reduces morbidity and post-surgical complications while accelerating recovery.
- 6) Less implant failure. The implants are made of titanium and are therefore less tissue reactive and less likely to break. The strain put on the implants is less than what is seen with the TPLO.

Differences between the TTA and the TPLO

- 1) TTA moves the joint force to meet the tibial plateau; TPLO moves the plateau to meet the joint force.
- 2) TPLO increases internal joint forces; TTA reduces them by lengthening the lever arm to the patellar tendon.
- 3) TTA does not change the geometry of the joint.
- 4) TTA is less invasive and surgically more simple.
- 5) TTA restores femorotibial contact patterns similar to those prior to CCL rupture.

6) TTA takes into account the stabilizing force of the quadriceps muscle.

