

What is a TTA

Your dog has torn the cranial cruciate ligament. Stabilization of this ligament is the most common procedure performed by the veterinary orthopedic surgeon. The cranial cruciate ligament is located inside the stifle (or knee) and is one of the four main stabilizing ligaments in the joint. An intact cranial cruciate ligament is necessary to prevent forward and backward sliding of the femur on the tibia bone.

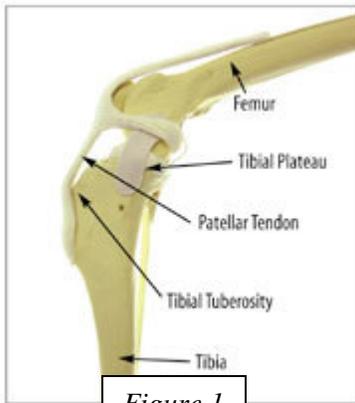


Figure 1

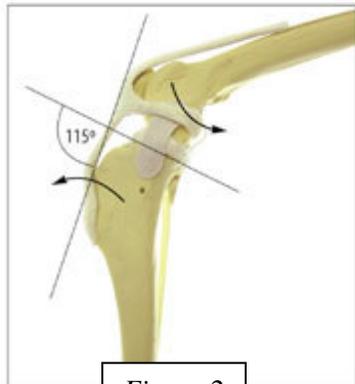


Figure 2

Rupture of the cranial cruciate ligament affects all ages and breeds of dogs. Tearing of the cruciate ligament is often a gradual process (partial tear) and not simply due to a single traumatic event. Most dogs have a predisposing factor such as age-related ligament degeneration, pre-existing inflammation, anatomical abnormalities, or excessive slope of the top of the tibia, which cause the ligament to fail. Clinical signs of early cruciate ligament disease include stiffness or very mild lameness. As the disease advances and the ligament progressively tears, the lameness becomes more pronounced. Complete tears initially result in non-weight-bearing on the limb, but as time goes on the dog will start to use the limb. It is unusual for the lameness to totally resolve following a complete tear of the cruciate ligament in a large breed dog unless surgery is performed. Rupture of the cranial cruciate ligament in both stifles is common. In fact, almost one half of the dogs that have a torn cranial cruciate ligament will ultimately develop a tear involving the opposite stifle.

A TTA (tibial tuberosity advancement) was performed to stabilize your dog's torn cranial cruciate ligament. The bone just below the stifle joint is the tibia and the bone above is the femur. The top of the tibia is the tibial plateau. The patellar tendon attaches the patella (kneecap) to the tibial tuberosity (*Figure 1*).

During normal weight bearing, the femur is predisposed to slide back down the tibial plateau (*Figure 2*). The intact cranial cruciate ligament prevents this from occurring. When the cranial cruciate ligament is torn this sliding motion takes place, resulting in instability and lameness. The sliding motion of the femur down the tibial plateau must be corrected for resolution of the lameness.

During the TTA procedure an osteotomy (bone cut) is made just behind the tibial tuberosity. The tibial tuberosity is advanced forward to achieve a perpendicular relationship between the tibial plateau slope and patellar tendon (*Figure 3*). This new angle redirects the forces in the stifle and



Figure 3

prevents the femur from sliding down the tibial plateau, thus stabilizing the joint during ambulation.

The advanced tibial tuberosity is secured using titanium implants (*Figure 4*). A bone graft is packed in the open area of the osteotomy. The osteotomy heals in ~8-12 weeks and the metal implants do not usually require removal.



The majority of dogs having a TTA achieves normal or near normal function of the limb (full weight-bearing). The dogs that do not have a full return of function often have concurrent arthritis of other joints on the affected limb or advanced degenerative joint disease in the affected stifle. However, most of the dogs in this group are still improved following the TTA procedure.

As with any surgery, complications may arise. Some swelling and bruising around the surgical site are common, with both usually resolved within 7-10 days of surgery. Infection is an unusual complication as strict sterile technique is used during the surgery and antibiotics are administered during and following the procedure. If corticosteroids are given to a pet for reasons such as skin allergies, healing of the bone may be impaired and susceptibility to infection increases. Poor healing, fracture of the bone, or breakage or loosening of plates and screws can occur if the pet is too active, especially during the initial healing phase (first 2 months after surgery). If bone fracture or implant failure results in shifting of the tibial tuberosity, re-stabilization of the TTA may be necessary. Those dogs that have significant complications postoperatively or have been previously operated using another technique may have a slower or less complete recovery.

Arthritis usually is present in the affected stifle at the time of surgery. Unfortunately it is not possible to reverse the arthritic and degenerative state of the joint, but the surgery can help to minimize its progression. Clinical signs of arthritis include stiffness associated with heavy exercise or following rest, or during periods of cool or damp weather. Anti-inflammatory medications and chondroprotective medications may be helpful in ameliorating clinical signs.

Following the TTA procedure the stifle joint is stable and the bones no longer slide or move abnormally when the dog walks or runs. In ~12 weeks the osteotomy heals and the dog can return to normal activity. We have included a very specific list of postoperative care recommendations that, if followed, should give your dog the best chance for a complete and uneventful recovery.