



## THE TTA OR TIBIAL TUBEROSITY ADVANCEMENT

The three most common corrective procedures for the repair of a torn ACL are: the external capsular repair, the TTA, and the TPLO.

### THE EXTERNAL CAPSULAR REPAIR

This procedure involves stabilizing the joint by placing a very strong suture under the skin but on the outside of the joint to stop the Tibial Thrust that was explained in the “Rupture of the ACL” section of this site. It relies on the production of scar tissue to eventually hold the joint stable. Even though there have been many patients that have had very successful outcomes with external capsular repair, the number of dogs that do not stabilize adequately is too high to consider it a suitable treatment for this injury. One of the factors that contribute to the frequent failure of this procedure is the length of time (4-6 months) that it takes for the stabilizing scar tissue to form, it is very difficult to control the activity of some dogs for such a long period of time. All it takes is one moment of high energy exertion or play to break down all of the healing that has taken place and return the dog to complete instability. In addition, this procedure does nothing to stop the forces that contribute to Tibial Thrust; the femur is still trying to slide off the back side of the tibia every time the dog puts weight on the leg.

The TTA and the TPLO both work off of the same premise of restructuring the stifle joint so that Tibial Thrust is neutralized. Both of these procedures have an advantage over external capsular repair because when they neutralize Tibial Thrust, this means that during normal weight bearing the femur is not being forced off of the back of the tibia. The measurements used to develop the surgical plan for both the TTA (common tangent) and the TPLO (plateau angle) in a patient are very similar, but they are derived by using slightly different landmarks on your dog’s x-ray, which may cause some confusion as you compare these two specific surgeries.

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This is a surgery that was introduced in 2004 as an alternative method of correcting the pathology created when the ACL is torn. It has been used successfully in over 30,000 dogs. Some of the advantages over the TPLO are that the bone cut (osteotomy) does not compromise the weight bearing surface of the tibia, it decreases the pressure applied to the Femur beneath the Patella which should stop or decrease further arthritic changes in this area of the joint. In addition, Patellar luxation can usually be corrected with the TTA in a simple manner.

When viewed from the side, in a normal standing position, the rear limb of a dog is not straight. The angle between the femur and the tibia is less than 180 degrees (typically it is about 150 degrees). At this angle, there is a load on the ACL which contributes to tibial thrust. When the leg is flexed to approximately 110 degrees, the angle of the common tangent (between the femur and the tibia) intersecting the patellar ligament is 90 degrees (the ACL is no longer loaded) and tibial thrust is neutralized; this angle is called the “cross-over” point. Any time the stifle is flexed at an angle between this cross over point and 180 degrees the ACL is loaded. Any time the stifle is flexed below the “cross-over” point, the ACL is not loaded and Tibial Thrust has been neutralized. The purpose of the TTA surgery is to change the cross-over point. When completed tibial thrust will be

eliminated, and your pet's stifle will be comfortable and stable while standing in a normal position.

Changing the cross-over point is accomplished by moving the Tibial Tuberosity (top, front of the shin bone) forward so that in a normal standing position the angle between the common tangent and the patellar ligament is 90 degrees. The tibial tuberosity is cut away from the tibia and a titanium cage is then inserted into the opening where the bone was cut to act as a spacer to hold tuberosity forward from its original location. The tuberosity is secured in place with a titanium plate, and the opening between the tuberosity and the tibia (the osteotomy) is packed with a synthetic bone graft material that will provide a matrix to help the space fill with bone.

Your pet will need to be leashed for about 8 weeks from the time of the surgery to allow the osteotomy to fill with bone. During a portion of this time your pet's leg will be immobilized in a custom made splint that is meant to decrease the likelihood of them stressing and damaging the surgery site before it gains adequate strength. A radiograph will be taken about 4 weeks after the surgery to check for adequate healing.

### THE TPLO OR TIBIAL PLATEAU LEVELING OSTEOTOMY

This procedure involves cutting away a portion of the top of the tibia, rotating it and reattaching it with a bone plate. This cut encompasses the weight bearing surface of the tibia. The TPLO is technically more difficult to perform than the TTA. It increases the pressure that is exerted by the patella (knee cap) on the femur, which increases the risk of cartilage erosion and arthritis at this location. In a few cases, it has an advantage over the TTA because some angular limb deformities might be corrected with the TPLO. Also, if the tibial plateau angle is too steep it may not be possible to advance the tuberosity far enough to negate tibial thrust. If either of these conditions are found on exam, you will be encouraged to discuss them with a TPLO surgeon.