

## **Bishop Ranch Veterinary Center & Urgent Care**

### **Tibial Plateau Leveling Osteotomy**

Courtesy of Veterinary Speciality Associates  
[www.VSAsurgery.com](http://www.VSAsurgery.com)

Tears of the cranial cruciate ligament are the most common orthopedic condition we see in our practice. Tibial Plateau Leveling Osteotomy (TPLO) has been a revolutionary technique for the treatment of cranial cruciate ligament tears in dogs. This procedure was developed by Dr. Barclay Slocum, who was known nationally for his innovation in veterinary surgery. This highly technical procedure involves rotating the tibial plateau using a specially designed radial saw blade and patented bone plate to counter tibial thrust, one of the forces responsible for cruciate ligament stress in dogs. This surgical procedure provides passive stability to the cruciate deficient stifle. VSA surgeons have been performing the TPLO for over 7 years now with over 4,000 TPLO procedures performed. After a TPLO, dogs return to full activity much more rapidly than with conventional procedures. Additionally the TPLO provides the advantage of less overall arthritis formation compared to other procedures. This procedure is highly recommended for dogs over 40 pounds and can also be performed on smaller dogs with a highly active or performance lifestyle



#### **How and Why Does the TPLO Work?**

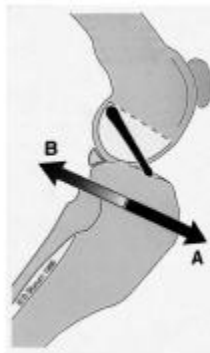
The canine stifle is supported by a variety of ligaments. The cranial cruciate ligament is the most frequently damaged. The cranial cruciate ligament prevents the tibia (shin bone) from displacing forward.



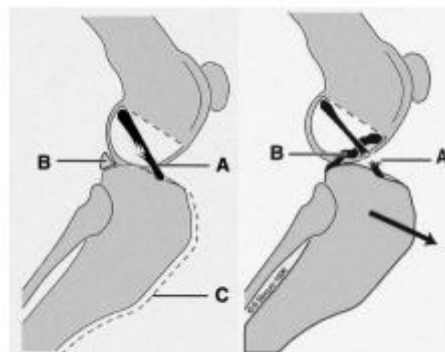
Unlike the human knee, the canine tibia slopes backwards. This results in a force called Cranial Tibial Thrust.



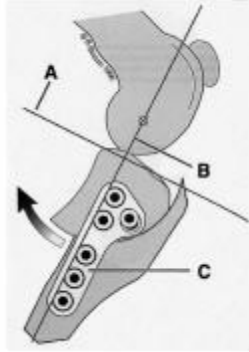
Cranial Tibial Thrust is produced as the dog walks, producing a forward force on the top portion of the tibia.



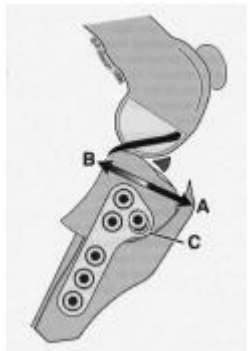
In the dog knee, forward translation of the tibia is counteracted by the cranial cruciate ligament as well as a balance between the hamstring and quadriceps muscle groups.



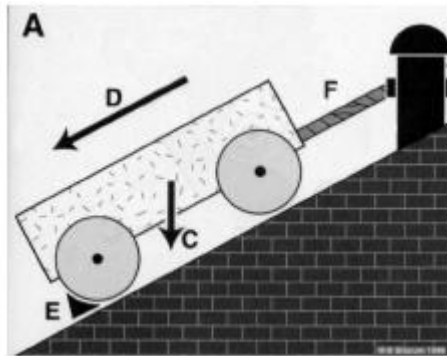
Once the cranial cruciate ligament becomes damaged or is completely torn (A), there is an imbalance within the knee. Due to the cranial tibial thrust, this results in forward motion of the tibia. In addition, if the ligament becomes partially torn, the repeated strain results in an eventual complete tear in most dogs. With either partial or complete tears, the stifle becomes progressively unstable resulting in pain, damage to the medial meniscus (B) and arthritis.



The TPLO, unlike conventional procedures, changes the biomechanical forces within the knee by rotating the tibial plateau.



Thus cranial tibial thrust is negated and balance is reestablished within the knee resulting in a stable, pain free joint.



An analogy which is helpful in understanding how the TPLO works is demonstrated by these illustrations. Figure A can be used to represent a normal dog's knee. The wagon wheels represent the round condyles of the femur (thigh bone); the hill represents the tibial plateau slope. The rope (F) represents the cranial cruciate ligament which overcomes the tibial thrust (arrow D). As the dog bears weight (arrow C), additional force is added to arrow D because of the hill. One can see that if the rope breaks (F), the wagon will roll downhill, just as the femoral condyles slide down the back of the sloped tibial plateau with a torn cranial cruciate ligament. The medial meniscus (E) is not strong enough to support the weight of the wagon alone and can become crushed. In the past, conventional procedures have focused on replacing the function of the rope, but this is a large force to overcome. Over time, these repairs typically loosen resulting in motion in the knee and increased arthritis.

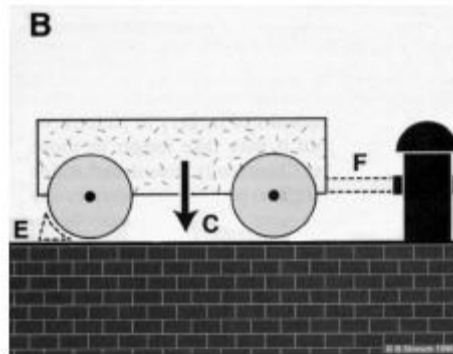


Figure B represents the effect of the TPLO on a dog's knee. Because the hill has been leveled, a rope (cranial cruciate ligament) is no longer necessary to prevent the wagon from rolling. Tibial thrust has been removed and the femoral condyles remain stable on the tibial plateau with the balance of the hamstring and quadriceps muscle groups restored.

## **Sample aftercare instructions for TPLO surgery**

### **Phase One: the first eight weeks after surgery**

It is imperative that your pet have strictly limited activity during the first 6-8 weeks after surgery to allow early bone healing . When your pet is unsupervised, he/she should be kept in a small, restricted area indoors such as a small room with a nonskid floor surface and without furniture he/she can jump on, or a crate. He/she is not to roam free in the house, or run, jump or play. He/she can sit with you in other areas of the house under full supervision, however, it is very important that he/she not be able to run to the door if the doorbell rings, or to the window to see a passing squirrel. Some people restrict their dog to a leash in the house for full control. Your pet may walk up and down stairs with you holding his/her collar and using the sling under his/her hindquarters for balance, but may not walk up and down stairs unsupervised.

A sling has been dispensed for you to assist your pet in rising, and walking on slippery floors or stairs. You do not have to support your pet's weight with the sling. It is to help balance him/her should he/she slip. Please use the sling at all times when your pet is not on secure footing.

When outside, your pet must be on a leash at all times. His/her activity must be restricted to short walks on the leash of 1/2 block(s) or less 2-3 times daily to urinate and defecate in the first two weeks after surgery. After the sutures are removed, you may increase the length of the walks to 1 block(s) . Two weeks later, you may increase the length again to 1 1/2 block(s) 2-3 times daily.

Bruising and swelling are usually at their worst during the first 2-3 days post surgery. The first day after your pet is discharged from the hospital, please place a cold compress on the incision 3-4 times daily for 5-10 minutes at a time. For the next five days after discharge, place a warm compress on the incision and hock 3-4 times daily for 5-10 minutes. There is likely to be swelling in the area of the hock due to gravity, and gentle massage of this area is not painful and will help the swelling subside.

If the region around the incision becomes progressively more swollen, your pet may have a seroma, which is an accumulation of fluid under the skin. This occurs most often with dogs that are very active immediately after surgery. Please call us for advice in dealing with a seroma if you are concerned that one is developing at the incision.

Please make an appointment to have your pet's staples removed in 10-14 days. If your pet is licking at his/her incision, please contact us to obtain an Elizabethan collar immediately. Licking can lead to problems with healing or infection of the incision.

If your pet suddenly yelps or changes drastically in his/her use of the limb, please contact us as soon as possible. This may indicate a severe problem.

Please schedule an appointment eight weeks after surgery for recheck radiographs to assess healing. Your pet may need to be sedated, so please don't feed him/her within six hours of the appointment, and plan that the appointment may take from 45 to 90 minutes. You may leave him/her at the hospital for the day if that is more convenient.

### **Phase Two: Rehabilitation**

Once radiographs have confirmed bone healing, the rehabilitation period can be started. During the next six weeks, your pet's activities will be gradually increased to allow him/her to rebuild muscle tone. The amount of activity should progress in a gradual fashion. The idea is to slowly increase the duration, not intensity of activity. Running, jumping and playing are still not permitted.

In the first two weeks of rehabilitation, you should take your pet on progressively longer leash walks. Begin with walks of two blocks in length. Continue this for a few days. If he/she remains comfortable, you can increase the length of your walks by \_ block approximately every 3-4 days. If he/she becomes sore after an increase in walk length, decrease the length again for a few days. You can walk him/her 2-3 times daily.

In the third and fourth week of rehabilitation, walks can be whatever length that your pet is comfortable with, but still on a leash at all times. Remember to walk him/her only the length that he/she can tolerate. Pushing him/her to do more at this time will not speed rehabilitation.

In the fifth and sixth week, your pet is allowed to have mild off-lead activity. He/she should be confined to an enclosed area with no other dogs, and under supervision at all times. No jumping, ball-playing or playing with other dogs yet!

We would like to check him/her again at the end of the rehabilitation period before full activity is allowed.