



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 highly technical procedure involves rotating the tibial plateau using a specially designed radial saw blade and 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. 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 medium to large breed dogs and can also be performed on smaller dogs with a highly active or performance lifestyle.

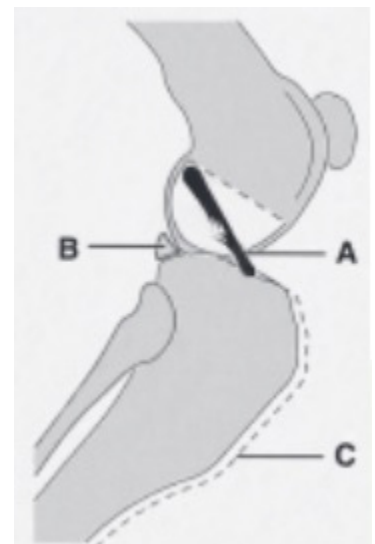
How and why does the TPLO work?

The canine stifle (knee) 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 in relation to the femur (thigh bone).

Unlike in the human knee, the canine tibia slopes backwards. This slope generates a natural 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 knee 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 stifle by rotating the tibial plateau. Cranial tibial thrust is thus negated and balance is reestablished within the stifle resulting in a stable, pain free joint.

An analogy which is helpful in understanding how the TPLO works is demonstrated by the illustrations on the following page.



When the cranial cruciate ligament is damaged or torn, it results in imbalance within the knee.



Figure A to the right can be used to represent a normal dog's stifle. The wagon wheels represent the round condyles of the femur; 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 stifle and increased arthritis.

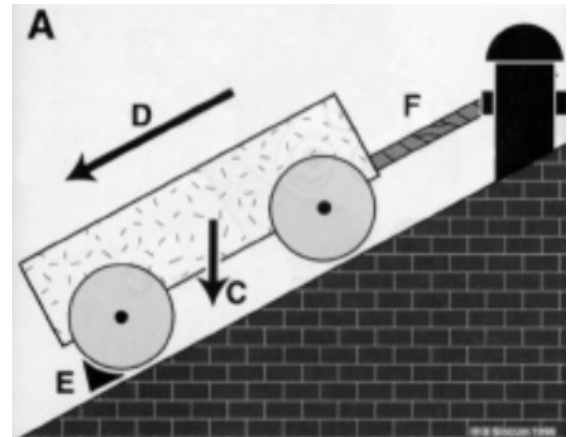
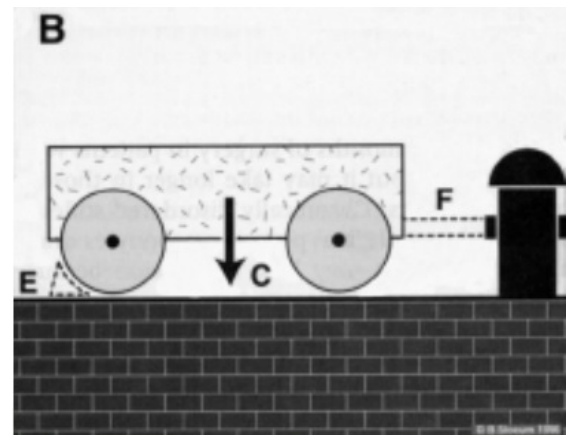


Figure B represents the effect of the TPLO on a dog's stifle. Because the hill has been leveled, a rope (cranial cruciate ligament) is no longer necessary to prevent the wagon from rolling. Tibial thrust has been removed and the femoral condyles remain stable on the tibial plateau with the balance of the hamstring and quadriceps muscle groups restored. During your initial consultation, we will be able to discuss the TPLO in greater detail using additional models.



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