

Veterinary Specialists of Alaska, P.C. Client Information Sheet: Tibial Plateau Leveling Osteotomy (TPLO)

Tibial Plateau Leveling Osteotomy (TPLO)

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This procedure improves stability of the stifle by repositioning the top of the tibia. The upper portion of the canine tibia (the tibial plateau) is sloped downhill toward the rear of the knee joint. Weight bearing creates a force that pulls the femur down the sloping tibial plateau, thereby shifting the tibia forward. The pull on the back of the femur by the gastrocnemius muscles contributes to this as well. This force is called cranial tibial thrust. Normally, it is opposed only by the cranial cruciate ligament. When the CCL is ruptured, this force goes unopposed and the stifle becomes unstable (Figure 1). The TPLO procedure eliminates cranial tibial thrust and stabilizes the joint by re-positioning the tibial plateau. During the procedure the tibial plateau is moved to a more level position thereby eliminating the need for the cranial cruciate ligament (CCL) as a restraint against cranial tibial thrust. In other words, rather than replacing the ligament which failed in the first place, this procedure will level the surface and eliminate the need for the CCL (Figure 2).

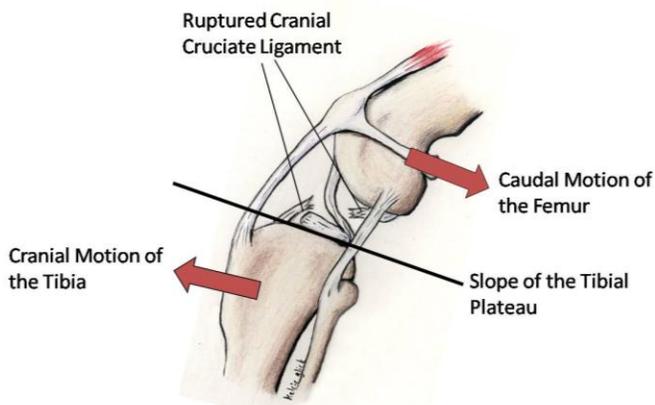


Figure 1: The caudal slope of the tibial plateau results in permanent instability of the stifle joint in animals with cranial cruciate ligament rupture.

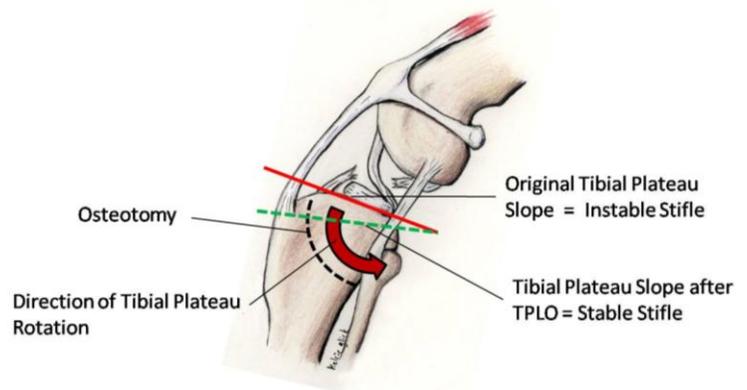


Figure 2: Decreasing the slope of the tibial plateau results in a stable stifle joint

If your dog is scheduled for TPLO surgery, we will obtain x-rays that can be used to assess the tibial plateau angle and determine if any torsional or angular deformity is present. After obtaining x-rays, the patient is taken to surgery and the inside of the joint is thoroughly inspected. The cranial and caudal cruciate ligaments are evaluated, as are the medial and lateral menisci. In many cases, this can be accomplished arthroscopically. The damaged cruciate ligament is then excised. If the meniscus is damaged, it is removed. In most cases, a meniscal release is performed to reduce the potential for subsequent meniscal injury.

Following inspection of the joint, a circular osteotomy (cut in the bone) is created in the top of the tibia. This frees up the tibial plateau so that it can be rotated into a more level position. The amount of rotation is determined by measurements from the preoperative radiographs. Torsional or angular deformities can be corrected at this time as well.

Internal tibial torsion is a common deformity and gives dogs a “pigeon toed” appearance. Tibial varus also is common and creates a bow-legged appearance. These deformities create abnormal stresses on the stifle joint and can be corrected in conjunction with TPLO surgery.

Once the tibial plateau is repositioned, a specialty plate and screws are used to stabilize the osteotomy and hold the bones in the new position. Postoperative x-rays are obtained to assess the new tibial plateau angle, limb alignment, and implant placement (Figure 3).

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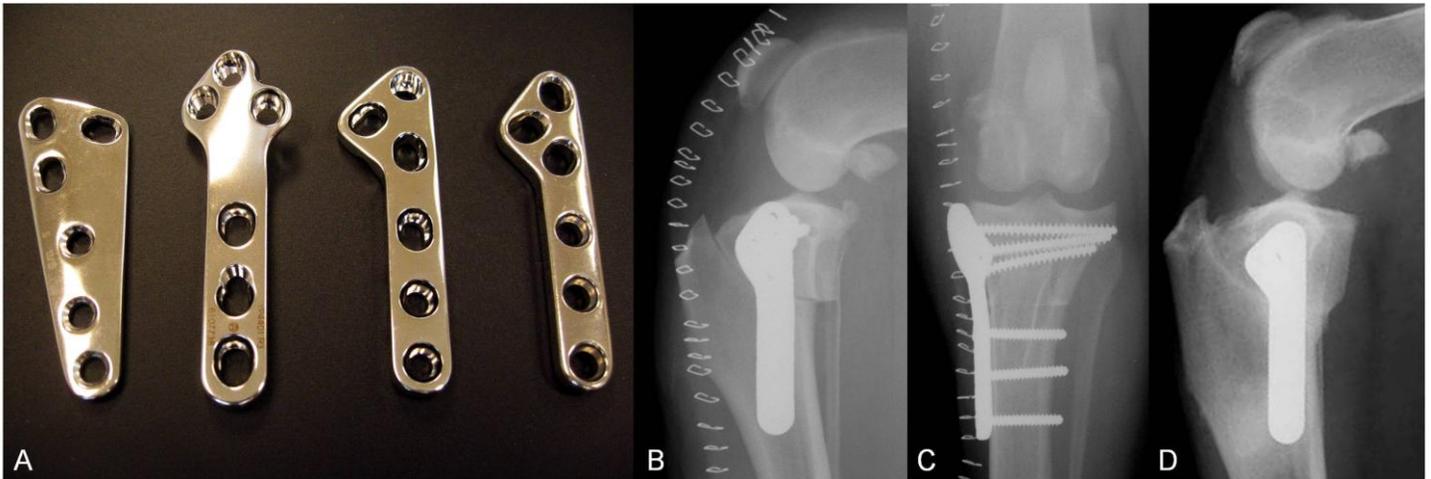


Figure 3: Various TPLO implants (A). Radiographs of applied TPLO-plate: After surgery (A and B), healed at 8 weeks after surgery (C and D).

Post-operative Care and Rechecks:

These patients are dismissed to the care of their owners on the day following surgery with instructions to limit activity until the bone is healed. Analgesic (anti-pain) medications and antibiotics are dispensed for administration at home. The Physical Rehabilitation staff will meet with you upon dismissal to discuss exercises to help minimize postoperative swelling and discomfort and to help maintain range of motion in your dogs stifle. During this time period, physical rehabilitation is focused on passive range of motion exercises and the use of massage and warm and cold compresses.

The first recheck usually is scheduled for 10-14 days after surgery. The goal of this recheck is to assess healing of the soft tissues and to determine if the stifle is stable. Muscle atrophy is often pronounced during the first two weeks after surgery. We recommend physical rehabilitation, beginning 2 weeks postoperatively, to minimize muscle atrophy and facilitate recovery without placing undue stress on the osteotomy and implants. At this stage, rehabilitation is centered on exercise in the underwater treadmill. The buoyancy of the water minimizes stress on the osteotomy and implants. The resistance of the water maximizes stress on the muscles, facilitating recovery of muscle mass and tone and joint range of motion. A side benefit of physical rehabilitation is that it allows your pet some diversion from the boredom of house confinement! Most of our patients really enjoy their physical rehabilitation sessions.

Radiographs are repeated eight weeks after surgery (Figure 4). These radiographs are important and allow us to assess healing of the osteotomy and stability of the implants. If the bone is adequately healed, your pet will be allowed to return to a higher level of activity. Once the bones are healed, further attention is focused on regaining muscle mass and overall conditioning. We generally encourage progressively lengthening leash walks at this stage. Most patients are able to return to their preoperative activity level at about 12 weeks after surgery.

Potential Complications:

As with any surgical procedure, there is potential for complications to occur. The frequency of complications for a given procedure decreases with surgeon experience. The surgeons at Veterinary Specialists of Alaska are highly experienced in TPLO and perform it approximately 10 times each week. Dr. Edwards learned this procedure in 1996 and was the first person licensed to perform this surgery in Alaska! Dr. von Pfeil was trained by one of the original investigators of the biomechanical effects of TPLO biomechanics, has performed well over 1000 TPLOs and published a modification of the TPLO surgical procedure, including an invention of a specific healing score system. During her surgical residency training, Dr. MacDonald also performed numerous TPLOs and is, as all of the surgeons at Veterinary Specialists of Alaska, highly experienced in this procedure.

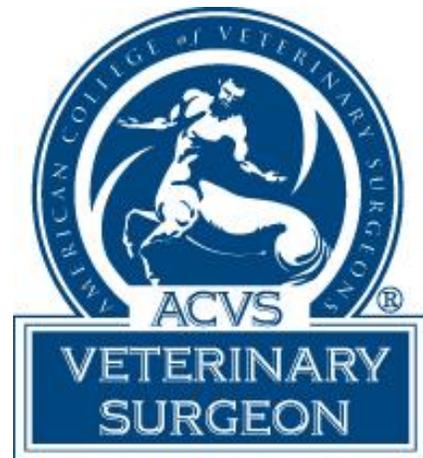
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While the risk of complications always exists, our training and experience with this technique minimize the risk of complications for your pet. Even more importantly, we are able to recognize and appropriately manage complications when they do occur. Your board-certified surgeon will discuss potential complications in detail as they apply to your pet.

Prognosis:

It is important to recognize that more than 50% of dogs who rupture one cranial cruciate ligament will rupture the other cranial cruciate ligament within two years.

The prognosis for our patients undergoing TPLO surgery is very good. Your dog should be able to resume his or her preoperative lifestyle. Our patients can be seen competing in agility, competing in field trials, and accompanying their owners in the backcountry! However, some dogs retain some degree of lameness and some will exhibit clinical signs associated with arthritis and may benefit from anti-inflammatory therapy.



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