

The Importance of Postoperative Rehabilitation after TTA or TPLO

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One of the most common causes of lameness in the canine is undeniably rupture of the cranial cruciate ligament. This injury results in lameness, muscle atrophy, and poor limb function, in some cases even after surgical intervention. Most practitioners still believe that dogs under 15 kg of body weight can undertake conservative therapy, while patients over 15 kg of body weight are most likely candidates for surgical intervention. Many procedures have been documented in the veterinary literature as potential repair methods for the cruciate-deficient stifle, yet to date none has been proven to be the “best-method” for all patients encountered in practice.

Most patients are referred to practitioners or specialists capable of performing either TTA or TPLO. There are many that still believe that the lateral suture method is very capable of adequate stabilization of the cruciate deficient knee, and in fact, scientific literature has failed to demonstrate significant differences in postoperative recovery between TPLO and the lateral suture technique, particularly when postoperative rehabilitation methods are incorporated into the recovery process.

The TPLO, first introduced in 1993 by Barclay Slocum, seeks to neutralize cranial tibial thrust by means of a radial osteotomy in the proximal aspect of the tibial, being secured by a procedure-specific bone plate. This technique realigns the tibial surface to a point where it is approximately perpendicular to the patellar tendon, the force thought to be most important in stabilizing the knee after surgical correction. A more recently introduced technique, the tibial tuberosity advancement, accomplishes a similar endpoint in that the tibial tuberosity is advanced to a point where the patellar tendon is perpendicular to the tibial plateau. TPLO is a very invasive procedure, and results in some permanent flexion of the knee, as well as a patient that must now load weight on an osteotomy. TTA requires much less surgical dissection, with its osteotomy placed in a frontal plane in a manner that the patient continues to walk on an intact tibial shaft postoperatively. Both procedures result in neutralization of cranial tibial thrust and adequate stability of the knee.

The many benefits of postoperative rehabilitation have recently come to light in many papers in the veterinary literature. The rehabilitation plan is influenced several factors. Younger dogs may require more intensive interventions due to their exuberant energy levels and accelerated healing capabilities, while older dogs may have less muscle mass and fitness resulting in decreased joint mobility. Obese dogs tend to suffer from decreased mobility, suggesting that preoperative weight management should be considered in severely overweight dogs. Large breed dogs may require more detailed therapies, while smaller dogs may better with leash walking, heat therapy and stretching.

Surgical method may also influence recovery plans and the patient’s response to implemented care. Open arthrotomies result in long, painful incisions, although trauma is decreased when the incision is distal to the parapatellar fibrocartilage and the patella is not luxated. TPLO results in extensive dissection of the muscles proximal to the stifle joint, to include the pes anserinus (sartorius (caudal belly), gracillus, and semitenindosus), the cranial tibialis, and the popliteus. With the TTA procedure, only the pes anserinus muscle is carefully elevated in a manner that should allow for its full reattachment. TPLO’s osteotomy is much more invasive to the knee than TTA, and may allow for inadvertent angulations postoperatively.

The implementation of rehabilitation methods in your hospital should be of paramount importance as it is a crucial part to enhancing your success with TTA or TPLO. Many inexpensive methods of rehabilitation exist that do not require intensive training of doctors and paraprofessional staff members. Basic plans can be implemented with specific goals in mind that although should be tailored to each patient, would require a minimum of intervention by the doctor.

As a mobile surgeon, I constantly enjoy training hospital staff members on proper and adequate rehabilitation methods that they can use in their practice, and correspond with them via email to help them track the patients’ response.

The rehabilitation plan begins with the patient profile, is the patient young, old, small, or large, and what procedure am I going to perform? I like to measure thigh circumference prior to surgery with the stifle in extension, approximately 2/3's the length distal on the femur and record this measurement in the chart. I also like to assess range of motion of the stifle with the patient awake. During the immediate postoperative period, the first 12 hours, I have the staff place an ice pack on the operated stifle for 20 minutes, every 2-3 hours throughout the day. If tolerated, I instruct the staff on passive range of motion exercises of the stifle, usually from 90 degrees of flexion to about 130 degrees of extension, and suggest 10 repetitions to be started immediately after surgery if tolerated.

Once the patient goes home, the rehabilitation plan is given to the pet owner in written format. The patient is discharged on a nonsteroidal medication, Tramadol (an opioid agonist), and a nutraceutical product containing chondroitin and glucosamine. The first two weeks involve ice therapy, passive range of motion, short leash walks, and massage. At the 10-14 day period, the patient has sutures removed, and range of motion and thigh circumference are measured and compared with the preoperative values. The remaining rehabilitation plan is reviewed with the client, and consists of an additional 10-12 weeks of further therapy to include; balancing exercises, sit-to-stands, figure-8's, heat therapy, massage, leash walking, and perhaps underwater treadmill work or therapeutic ultrasound. For those practitioners that have them (or are interested in them), therapeutic lasers have shown very good clinical results in postoperative rehabilitation programs.

The patient is re-evaluated at the 12 week mark with the doctor. Radiographs are repeated to assess adequate healing from the osteotomy. Cranial tibial thrust is evaluated. Thigh circumference and range of motion of the stifle are measured. If the patient is responding well to the surgery and rehab plan, the owner is next instructed to gradually allow the patient increased freedom and off-leash work.

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Rupture of the cranial cruciate ligament (CrCL) in the stifle of the dog is probably the most common cause of hind limb lameness documented in the veterinary industry. The goal intended is to advance the tibial tuberosity, which changes the angle of the patellar tendon to neutralize the tibiofemoral shear forces during weight bearing. As a result, the joint becomes more stable without compromising joint efficiency. A TTA is a less invasive procedure than some other techniques for stabilizing the CrCL because it does not disrupt the primary loading axis of the tibia. Customer satisfaction is very high with this procedure, as the patient is able to recover very quickly and return to normal function.

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