Tibial Plateau Leveling Osteotomy (TPLO) for the Treatment of Canine Cruciate Ligament Disease – Information for Owners

SURGICAL REFERRAL SERVICE

INTRODUCTION

Your pet has been diagnosed with injury of the cranial cruciate ligament. This orthopedic disease is the most common that we see in our practice, and it affects dogs of various ages and breeds. It is essentially the same knee injury that is often suffered by people, where it is referred to as ACL (anterior cruciate ligament) injury. While we have traditionally viewed this as a traumatic injury, many canine patients present without any apparent trauma, but with a more gradual onset of vague lameness. Mounting evidence suggests that other factors result in damage to the cruciate ligaments, especially in some breeds such as the Retrievers and Rottweillers. This handout describes the surgical procedure called tibial plateau levelling osteotomy (TPLO), which is currently the procedure of choice for most dogs. Conventional, ligament replacement surgery is still performed routinely on smaller dogs, and is an option in all but giant breeds due to the lower costs involved. It is the subject of a separate handout.

DIAGNOSIS AND TREATMENT WITH TPLO

In most cases, cruciate ligament damage can be diagnosed during a complete orthopedic examination. The most important finding is instability in the stifle (knee) joint, which confirms rupture of the ligament. In some cases the ligament may be only partially torn, or there may be scar tissue preventing abnormal movement of the knee. In these cases, radiographs and other tests may be advised to confirm a diagnosis prior to treatment.

Tibial plateau leveling osteotomy represents a novel approach to addressing ligament damage and instability in the canine knee. While most conventional surgeries have been aimed at replacing the ligament with synthetic implants and/or tissue obtained from elsewhere in the leg, TPLO is aimed at neutralizing the forces that are allowing the knee to be unstable by performing a circular osteotomy (cut) in the tibia, which forms the lower part of the knee joint, and rotating it so that the slope of the bone is altered. This procedure has the affect of preventing the tibia from moving forward in an unstable manner. A specially designed bone plate is applied with surgical screws to hold the cut bone at the proper angle. The bone will then heal as with any fractured bone, in this case with permanently changed configuration.

In order to determine the proper amount of rotation of the tibia, radiographs need to be taken prior to surgery so that measurements can be obtained. In some cases it is determined that a conformational deformity is present in the tibia, such as inward or outward rotation. Because this condition can affect the function of the leg, an effort is made with TPLO to correct this problem at the same time. Radiographs will also be taken after surgery to assess the rotation and the position of the implants.

PROGNOSIS AND POTENTIAL COMPLICATIONS

The prognosis for most patients following TPLO is very good. While good results are also seen with conventional reconstructive surgery, the reported advantage of TPLO is better joint function, less stiffness, and a return to more complete activity. In giant breed dogs, the rate of failure for surgery appears to be significantly less with TPLO than with conventional surgical repair. Some degenerative joint disease (osteoarthritis) is expected following cruciate ligament damage, but there is evidence that it progresses more slowly following TPLO than after other procedures.

The TPLO procedure is very involved technically and results in the permanent reconfiguration of the knee joint and tibia. Although the complication rate is low, both minor and major complications can occur. Some bruising at the surgery site and swelling of the lower part of the leg are common following surgery and usually subside within the first week. One of the more common complications is inflammation of the patellar tendon, which is the large tendon that connects the knee cap to the tibia. This inflammation will often not appear for several weeks and is due to increased stress on the tendon resulting from the altered configuration of the knee. It is a temporary problem that can last from days to weeks and is generally treated with anti-inflammatory medication and continued rest. The most serious complications involve delayed bone healing, failure of the implants, or fracturing of the bone, which may result in further surgery. Proper exercise restriction will help to lessen the chances of serious complications.

We frequently see dogs that eventually develop cruciate ligament injuries on their other hind leg. Some studies put the incidence of this type of recurrence as high as 40-50%. This recurrence is even more of a risk in breeds that commonly experience this injury if there are predisposing factors, such as obesity, thyroid deficiency, etc. To try to prevent injury to the other knee, we recommend keeping your dog in good physical condition and limiting extremes of activity that include a lot of twisting and turning.

POST-OPERATIVE CARE

Because TPLO involves cutting the tibia, exercise needs to be very restricted until complete bone healing occurs over 8-12 weeks. This restriction involves confinement to a small area with minimal on-leash activity outside and only supervised movement on good footing when inside. Once adequate bone healing is confirmed with follow-up radiographs, a progressive re-introduction of activity is recommended over about two months.

Ongoing anti-inflammatory medication is generally not required beyond the first 3-4 weeks for most dogs. We do recommend treatment with chondroprotective (cartilage protecting) medication as a form of long-term therapy for osteoarthritis. Specific recommendations will be made at the time of surgery and should also be followed in consultation with your veterinarian.

SUMMARY

TPLO is being offered as a promising new treatment for medium and large dogs with cruciate ligament injury. Technically, it is more involved than traditional surgeries and is therefore more expensive with added follow-up costs. Balanced against these disadvantages are the positive clinical results, with dogs returning to higher levels of function, and fewer complications when compared with traditional surgical treatment. These factors need to be considered by each owner when deciding on the best approach for your dog. We will try to be as helpful as possible in answering any questions you may have.

FREQUENTLY ASKED QUESTIONS

How long will my dog need to stay in the hospital?
The usual hospital stay is one night after surgery, with discharge the following afternoon. Because of our association with the Veterinary Emergency Clinic, veterinarians and staff are available through the night to monitor your pet and provide medication for pain control.

How will I get my dog into the car? Will I need someone to help?
With very rare exceptions, dogs are able to walk outside the day after surgery, although they are often holding the affected leg up. Getting them into a car is usually a simple matter of giving them a "boost." If you are alone and need help, our nursing staff will be happy to assist you to the car.

Will my dog have pain medication?
Patients are usually discharged with a pain-relieving anti-inflammatory drug, such as Deramaxx or Metacam. This medication is typically administered for about 4 weeks after surgery. While patients are given narcotic medication for pain the night after surgery, they generally do not need this form of medication at discharge except in special circumstances.

My dog is very excitable. Is there any kind of sedative I can give?
We generally do not discharge dogs with any form of sedative. Sedatives are not safe to give on a long-term basis and, therefore, are not a solution for keeping your pet's activity limited for several weeks.

Will there be a cast/bandage on the leg? How will I keep my dog from licking the incision?
No cast or bandage is placed on the incision after surgery. Because the surgical repair involves a joint, it is essential that there be some motion of the joint after surgery to prevent it from becoming stiff. Only a minority of dogs attempt to lick or otherwise damage the incision. If we see this happening when the dog is still in the hospital, we may send home a protective (cone) collar to be worn whenever your pet is unsupervised. If you observe any repeated licking at home, contact us as soon as possible for advice. Licking an incision is not nature's way of healing it, and it can lead to complications such as infection.

Is it OK for my dog to climb stairs after surgery?
This depends on the size of your dog, the number of steps, and the footing on the stairs (hardwood vs carpet). For most large dogs, some climbing of stairs is acceptable. We usually suggest keeping it to a minimum for the first 1-2 months, and ideally someone should be present to ensure the dog does not run up the stairs. In some cases, we will advise using a sling to support the hindend for climbing stairs. Small dogs can be carried up and down stairs for the first 1-2 months.

Does my dog need to be kept in a cage?
In general, cage confinement is not necessary, but in some cases it may be the best solution for you. Larger dogs can have some freedom within the house as long as running, playing, jumping, and access to stairs are limited. If there are slippery floors such as hardwood, you may want to consider placing a runner carpet in areas where your dog will spend a lot of time.

Do I really have to take my dog out on leash every time?
We strongly recommend leash activity only for the first three months. Even if your dog normally just walks around the yard, consider if there is any chance of him chasing a squirrel or running up to a fence when the neighbours are out. Any kind of sudden explosive activity in the first several weeks could put the entire surgical repair at risk.

Do we have to keep our dog separate from our other dog?
If there is any chance that another dog could entice the patient to play or to engage in other prohibited activity, the two dogs should only be together under supervision.

I had my knee scoped when I injured it; is the surgery done with a scope?
While arthroscopy (scoping of joints) is a growing area in canine surgery, there has not been a reliable method of arthroscopic reconstruction developed for dogs.

What about physiotherapy?
Since most dogs are bearing some weight within 2 weeks of surgery, there are usually no physiotherapy instructions other than the gradual increase in walking activity over several weeks. However, additional physiotherapy techniques have been shown to speed recovery. If you are interested in this and feel that you can devote even more time and energy than we have already asked of you, feel free to ask us to go over some of these techniques with you.

How long will it be before my dog can run again? Will he eventually be able to run and play like before?
Some introduction of short, supervised jogging/trotting is usually fine about three months after surgery. Full running should be avoided until four months after surgery, and even then should be introduced only in small amounts. Our goal is to have pets return to normal levels of function in most cases, but there may be some limitations due to the osteoarthritis. Also, dogs who have cruciate ligament disease in both knees, or other orthopedic or spinal problems affecting their hind end, are more likely to have limited activity.