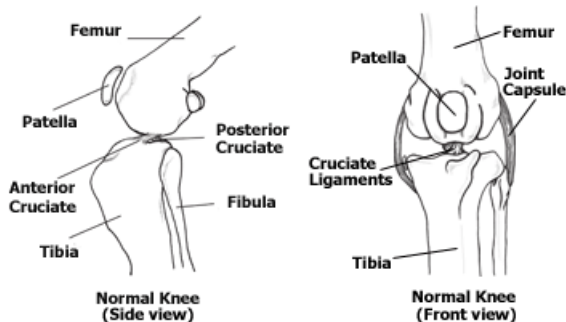


Cruciate Disease and TPLO Surgery



The Canine Stifle (Knee) Joint

A ligament is a tough fibrous band of connective tissue that runs between two bones. Ligaments can be viewed like a rope, with the large band being made up of lots of smaller strands. The cruciate ligament runs between the lower part of the femur to the upper part of the tibia. There are actually two cruciate ligaments that cross the knee joint, the cranial and the caudal. They function with other supporting structures to ensure the knee only bends the way it should do.

Why Do Cruciate Ruptures Happen?

Cranial cruciate ligament rupture is one of the most common hind limb orthopaedic conditions we see in dogs. We don't understand all the reasons for this disease process and all breeds of dog are susceptible. We see two general patterns of cruciate disease; a gradual deterioration leading to eventual rupture or less commonly rupture through trauma.

Gradual deterioration is usually seen in older, often overweight animals where a low grade inflammation inside the joint causes a weakening of the ligament strands. This is often seen as multiple episodes of mild lameness that will correct in a few days until finally the ligament is weak enough to snap completely. With these cases we often see osteoarthritis in the knee joint as the body has responded to the inflammation that's present. This can also lead to damage to the cushions within the joint (called the meniscus). Where animals are obese it adds to the strain that the ligament is put under, therefore increasing the likelihood of rupture.

In the older dogs where there has been a gradual deterioration in a cruciate ligament we often see the same processes going on in both knees rather than just one knee. Owners should therefore be prepared for their dogs needing surgery in both legs at some point.

What Happens To A Stifle After Cruciate Rupture?

As previously mentioned the cruciate ligaments function is to stabilize the knee joint so it only bends the way it should do. The cruciate ligaments also provide some support to prevent the stifle from twisting abnormally. It is almost always the cranial cruciate ligament that ruptures and this ligament prevents the tibia from being pushed out from under the femur. Once it breaks dogs usually hold the leg in the air in a bent position. Some dogs will still walk on the leg and occasionally you can see the tibia moving underneath the femur as they walk, this is termed a drawer sign.

In more chronic cases we find dogs have usually had abnormalities with their walking for a while so they lose muscle in the affected leg, particularly the quadriceps muscle group. There is usually a progressive and permanent roughening/deterioration in the smooth joint cartilage due to inflammation which accelerates osteoarthritis. A reasonable number of dogs will also damage the internal cushions inside the joint (the meniscus).

The xrays below demonstrate a normal and arthritic joint associated with chronic cruciate instability.



Normal Joint



Arthritic Joint

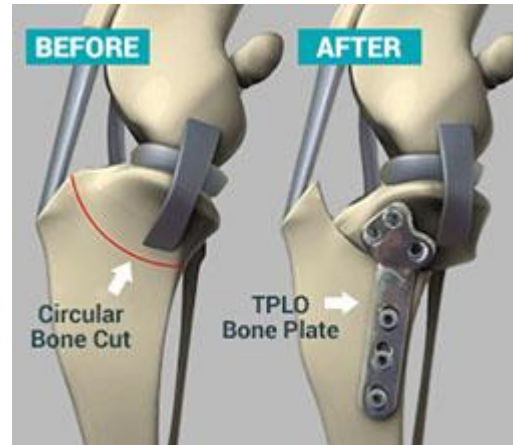
What Can We Do About It?

Once the cruciate ligament has ruptured, the above degenerative process happens very quickly. For the vast majority of cases, surgery followed by physio therapy, is the only option for any hope of returning to normal function longer term. If animals are left to recover on their own, you will usually see some improvement, often a slow increase in weight bearing, and some dogs will even look normal for some time. The joint will remain unstable and the knee will deteriorate rapidly and irreversibly.

There are lots of different surgical options described for cruciate rupture in dogs. Here at Nelson Vets we have dealt with thousands of cases over our careers so we are only recommend what we consider to be the most up to date and most effective options.

The most effective procedure involves remodeling how the forces are transmitted through the knee joint in order to produce stability. In a normal standing dog, the body weight is forced up the leg to the lowest point of the knee joint, the tibia. This force tries to push the tibia out from underneath the femur and is called tibial thrust. The cruciate ligament stops this movement from happening. By altering the position of the top of the tibia we can make it so this thrust force is no longer produced, therefore the knee no longer needs a cruciate ligament to function.

Before surgery, an x-ray of the stifle is taken to measure the angle at the top of the shin bone, called the tibial plateau angle. The goal of the surgery is to reduce this angle so that dynamic joint instability (cranial tibial thrust) is eliminated. This is usually accomplished by creating a post-surgical angle of between 0 and 10 degrees, an angle not much different than is found in the human knee. In most cases the surgical procedure starts with an exploration of the inside of the stifle joint. The purpose is to assess the meniscal cartilages for any possible damage. Damaged cartilage must be removed if the dog is to regain normal pain-free function. The TPLO procedure itself involves the use of a curved saw blade to make a curved cut on the inside, or medial, surface of the top of the tibia. The cut top portion is then rotated to create the desired tibial plateau angle. A stainless steel bone plate is then placed on the bone to hold the two pieces in their new alignment.



To produce this change, we use a curved saw to cut the top of the tibia, rotate it round by a pre-calculated amount, and then use a specially made plate to hold this cut in position until it heals.

The X-ray above was taken immediately after surgery to check implant positioning.

After TPLO surgery we expect to have this surgery and physiotherapy combination, the arthritic deterioration is significantly reduced and your dog is likely to get back to normal function after 3 months.

Post Operative Care

To perform the surgery we have to make a cut to the skin on the inside of the leg. The skin is closed using a technique where there are no external sutures for dogs to nibble at so we don't tend to send dogs home with a plastic collar. The skin should heal normally over a period of 7-10 days, but the bone will take at least 6 weeks to gain enough strength to begin exercise.

We usually keep most dogs in overnight on the day of surgery. The following day they will usually have got over the anaesthetic enough and we are able to assess how comfortable they are. They usually go home with a slow release pain relief patch on their side and further pain relief medication which you are to give at home. If we feel they need it then we may add other drugs as well.

Walking protocol: For the **FIRST 10 DAYS** there is an easy protocol to follow: **NO walking!**

It is ok to take your dog outside to go to the toilet on a lead (to stop them running around) where possible, always avoid going up and down steps.

Each week after this, we will be increasing the amount of walking needed for your dog's rehabilitation. However it is important during the first 6 week period not to let your dog do too much too soon. Most dogs will be weight bearing well on the leg a week or so after surgery and this generally continues to improve over the coming weeks. Most complications following surgery are associated with dogs getting to run around or jump too soon following surgery.

No matter how well your dog is doing it is very important not to let them run, jump or exercise off lead until at least 10 weeks post surgery.

Physio exercises:

In the early stages you can help recovery by gently massaging the muscles in the leg and applying cold compresses to the



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surgery site for 5-10 minutes twice daily.

As your dog progresses different physio exercises will help with their recovery, this will be on a case to case basis.

Rechecks:

Post surgery I would usually plan to see them back first after 3-4 days to remove the slow release pain relief patch and to check the surgical site.

Then we see them back 10 days post surgery to start the first physio session.

At week 6 post surgery we need to have them back in to have an x-ray taken to check how the cuts to the bone are healing. This does need to be done under sedation so they will need to stay with us for the day. If everything is looking good on this x-ray then we can start to increase walking and advancing the physio sessions. It is possible that we may have to recommend a longer period of rest if the x-rays show the bone healing has been slow.

Generally dogs will be back to their full exercise levels at 16 weeks post surgery. A few dogs will show some residual low grade lameness but this usually resolves over the coming weeks as the muscles adapt and get stronger.

The above is meant as a general guide and it may be that we have to recommend a different regime for your dog depending on what we see during or post surgery. Every dog is different so if there is something you are not sure about then please get in touch with us. There is no such thing as a stupid question!

What Are The Potential Complications With Surgery?

Complications are not common and when they do occur most will resolve when given time to rest and anti inflammatories. **95% of complications after surgery are from dogs getting to do too much too soon.** No matter how well surgery goes it is important to remember that we never make the joint perfectly normal again and it is not possible to perfectly predict how every dog will do following surgery. Below are listed some potential complications following surgery

Fractures - Fractures can occur around the surgery site but they are extremely rare and are almost always a result of a dog doing too much too soon. I have only ever seen two and both of these recovered uneventfully when they had been cage rested without the need for surgery.

Late meniscal injury - As mentioned briefly before the meniscus is a cushion inside the joint that aids the transfer of the body weight through the joint. A very small number of dogs, approximately 5-7%, will develop a tear in this cushion sometimes months or years following surgery. There is no way to stop it happening or to predict which dogs will get it and which wont. When it happens the dog will go suddenly lame and may not weight bear at all. Some will resolve again with pain relief and rest but a few will require a subsequent surgery to remove the damaged area.

Arthritis - Once a cruciate has ruptured there will inevitably be some deterioration within the joint. Surgery doesn't totally prevent this but it will dramatically reduce the speed and severity of the deterioration process. If arthritis is already present in the joint we cant reverse this.

Continued discomfort - Following surgery 90% of dogs will be able to return to normal exercise levels. Of the remaining 10% the majority will be far better than without surgery but they continue to show some levels of discomfort. This is usually seen as a limp or stiffness after prolonged or strenuous exercise or after rest. Most can be treated well with periodic use of anti inflammatories but if this is severe then we may need to repeat xrays.

Licking - Most surgical wounds are closed in a manner which means that there are no external sutures. This reduces the likelihood of dogs licking at the surgical site but it doesn't totally prevent it. Licking can introduce infection into the surgical



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site and dogs can potentially open up the whole wound. If you see licking then it is best to use a plastic collar to stop it.

Infection - We work to very high standards of sterility and generally use intravenous antibiotics during surgery to try and reduce infection. It is almost unheard of to get infections post surgery but it is still possible, especially if surgical sites get licked or wet when they go home. It is possible with infections to need to remove certain implants, which would require another surgery.