TIBIAL TUBEROSITY ADVANCEMENT (TTA)

Cruciate disease in the dog

Cranial cruciate ligament (CCL) disease is the most common cause of hindlimb lameness in the dog. It affects the stifle joint, the equivalent of our knee. The CCL can rupture suddenly but most commonly we see a progressive degeneration of the ligament. This can result in a partial or complete tear. The CCL is an important primary restraint mechanism for the knee. It prevents excessive forward and backward sliding of the femur (thigh bone) on the tibia (shin bone) and limits internal rotation of the joint. When the CCL tears it is painful and the joint becomes unstable. This instability can damage the cartilage in the knee. Cruciate disease occurs alongside a chain of inflammatory processes that result in arthritis.

Does my dog need surgery?

This is always worth discussing with your vet. Several studies from the 1970s and 1980s report a satisfactory outcome following close confinement for 6-8 weeks. This was only seen in dogs weighing less that 15kg and it should be pointed out that the long-term outcome in these studies is unknown. Nonetheless, this non-surgical approach can be an option for smaller dogs or cats. At VetFix, we would still recommend surgical treatment. Our concern is arthritis will progress more rapidly if the joint is not stabilized. For larger dogs there is no benefit to a “wait and see” approach and stabilization of the joint should be performed promptly even for partial tear cases. With surgery, a good to excellent outcome can be expected in over 90% of dogs.

Did you know?? Sterility for orthopaedic surgery is extremely important. At VetFix we use a new set of disposable sterile drapes, gowns and of course gloves for each dog. In addition we use a high dose of intravenous antibiotic to help keep infection risk to an absolute minimum.

Meniscal Injury

The menisci are important C-shaped disks of fibrocartilage that cushion and stabilize the knee. When we perform CCL surgery we are careful to assess the menisci for any damage. Damage to the meniscus is seen in about 30% of cases of cruciate disease. Tears in the meniscus are painful and limit recovery so it is important to carefully remove the torn areas. At VetFix, we only remove what is absolutely necessary and aim to preserve as much of the meniscus as is possible.

Did you know?? At VetFix we use a suction machine to perform a complete flush of your dog’s knee. This improves visualisation and removes any debris associated with the cruciate disease. We also use bi-polar cautery to keep bleeding to an absolute minimum.
**Tibial Tuberosity Advancement (TTA)**

There are three main techniques for cruciate disease management: TTA surgery, TPLO surgery and the lateral suture system (LSS). TTA and TPLO can be considered dynamic repair techniques and the LSS a static cruciate repair technique. TTA is a less invasive surgery than TPLO and dogs that receive the TTA procedure will often recover quicker. This does not make TTA any better than TPLO- this rightly comes down to surgeon preference. Both techniques produce excellent long-term results. There are also some cases when TTA surgery is not suitable and TPLO or another technique must be chosen.

TTA involves making a cut in the front part of the tibia (the tibial tuberosity) to allow this section to be advanced and stabilized with a cage and plate. This must be carefully planned.

![TTA Surgery Image]

The aim of TTA is to advance the insertion of the patellar ligament (the ligament from the knee cap to the tibia). In so doing, when the dog stands on the leg, the abnormal sliding movement within the knee will be eliminated.

**Did you know??** All the implants for TTA surgery performed by VetFix are made from titanium. Titanium is expensive but stays strong and flexible during use. It is considered the most biocompatible of metals.

**AFTERCARE**

Your dog will be discharged with pain killers and often a short course of antibiotics. Please give these as directed.

**Incision site care**

Please check the incision site daily and keep the bedding/room where your pet lives clean and dry. There will often be a small amount of bruising in the initial 3-5 days. Please contact your local vet should you notice discharge or excessive swelling from the wound (other than a small amount of crusting). Your pet should not lick the incision site. An E-collar may be necessary to prevent this.
Progress checks

These are often carried out by a veterinary nurse or your vet at 3-4 days, 10-14 days, 30 days, 6-8 weeks and 12 weeks after surgery. They may be more frequent if concerns arise.

What to expect?

Your pet may feel a little groggy for the first few days after surgery. If you think he/she is in pain, please contact your local vet for advice. Your pet should be restricted to a single clean room (ideally with no slippery flooring) with no access to stairs. To help him/her out for toileting, a towel can be used as a belly sling to take some weight off the back legs. A veterinary nurse can demonstrate this if necessary.

Important! We normally expect a small amount of weight to be taken on the leg within 10-14 days. If this is not the case, or if you are concerned about progress, please call your local vet for advice.

EXERCISE PLAN AND PHYSIOTHERAPY REGIME

Important! Please only do what you and your dog are comfortable with. No exercise should be painful or forced. Trying to do too much is far more dangerous than adopting a more conservative approach!

WEEK 1

Expect slight wound swelling and holding the leg up most of the time

STRICT REST

LEAD EXERCISE FOR TOILETING ONLY (BELLY SLING SUPPORT IF NECESSARY)

NO STAIRS. NO JUMPING. NO SWIMMING / UNCLEAN ENVIRONMENTS

ICE PACKING (DAY 1-3): Using a gel ice pack wrapped in a cloth, you can ice your dog’s knee (away from the incision) for 10 minutes, three times daily. Icing is one of the most important things you can do to help your dog in the immediate post-operative period. It controls and decreases inflammation and will help to reduce post-operative pain. Only do this if your dog is happy to let you do so.

WARM COMPRESS (DAY 4+): If the incision is clean and dry. Warm the gel pack in hot water and wrap in a cloth (Make sure it is not hot to touch). Apply to the knee for 10 minutes, three times daily.
MASSAGE: This is best done straight after the warm compress has been applied (ideally your dog is lying down, but can be performed in sitting or standing positions).

Massage movements are performed towards the heart to encourage venous flow, start at the paw and work up. Pressure applied should never be enough to cause pain. Always start with light pressure and work progressively into more.

- Use the whole of your hand to contour the leg in a stroking action, this will promote circulation and help relaxation.
- Massage using finger tips in a circular movement. Focus on muscle bodies and avoid bony areas.

Perform massage exercises for 10-15 minutes three to four times daily.

RANGE OF MOTION EXERCISES (DAY 4+): These should be very gentle with no attempt to go beyond what is comfortable for your pet.

Have your pet lie on his/her good side and gently flex and extend the operated knee while supporting the leg. Being very patient and careful, perform 10 slow repetitions. Repeat these three times daily. You should only do this if it is within your pet’s comfort level. Ask the veterinary nurse to demonstrate this exercise to you when in for a progress check.

WEEK 2-4

Expect some weight bearing on the leg

CONTINUE WARM COMPRESSES, MASSAGE AND RANGE OF MOTION EXERCISES: Continue flexion and extension exercises of the knee as described above. In addition, hold the joint in full flexion and extension for 5 seconds. Perform 10 repetitions and repeat three times daily. Again, do not go to the point of creating pain or resentment.

SLOW LEASH WALKS FOR 5 – 10 MINUTES TWICE DAILY: Walking slowly encourages your dog to use the leg. Soft flat ground (eg lawn) is an ideal surface.

UNDERWATER TREADMILL: Exercise in an underwater treadmill can begin from 30 days after surgery, normally after the 4 week review. This enables your pet to exercise in a controlled, warm and supportive environment. Underwater treadmill is great for encouraging limb use. This will help improve joint range of movement and muscles mass. Strengthening and reactivating soft tissues, muscles, tendons and ligaments will facilitate joint recovery and return of limb function. Ask your vet for a recommended centre near you.

Important! Your pet may feel like using the leg normally before the bone is healed. It is really important that the exercise plan and physiotherapy regime is followed. Don’t over do it!

WEEKS 4-6

Expect use of the leg but still a slight lameness
CONTINUE RANGE OF MOTION EXERCISES

SIT/STAND EXERCISES: Have your pet repeatedly sit and stand 10 repetitions twice daily. Use of a small treat can help with this! This should only be performed voluntary- do not push down on the rump. If your pet is not ready for this, give it a few weeks and try again.

INCREASE LEASH WALKS TO 15-20 MINUTES TWICE DAILY. This should still be on a short leash. Only increase exercise duration if your pet is showing good progress

WEEKS 6-8

Expect to have a progress check with your vet around now. They will often x-ray the leg and advise on the next step of your pet’s physical rehabilitation plan. Below is a guide only.

INCREASE LEASH WALKS TO 20-30 MINUTES TWICE DAILY: This should still be on a short leash but you can start to gradually increase time and distance. You can also start to incorporate uneven ground.

CONTINUE SIT/STAND EXERCISES

WEEKS 8-10

Expect good weight bearing on the affected leg

CONTINUE SIT/STAND EXERCISES

INCREASE LEASH WALKS TO 30-40 MINUTES: Like us every dog is different. You know your dog best. At this stage, rather than follow a rigid guideline, work with him/her to increase exercise levels up to what he/she is comfortable with. There is no point going on a longer walk if it is uncomfortable for your pet. Some dogs will recover quicker than others. Always take advice from your local vet.

WEEKS 10-12

Expect full weight bearing but remember every patient is different!

CONTINUE SIT/STAND EXERCISES Some dogs will have considerable arthritis and don’t expect too much of them. It is better not to do this exercise if it is uncomfortable.

CONTINUE LEASH EXERCISES FOR 30-40 MINUTES TWICE DAILY Younger dogs that are recovering well can also have a slow 5-10 minute jog on the leash at this stage. In addition, small hills and uneven ground will start to build up the musculature in the leg.

SWIMMING: Swimming is a wonderful rehabilitation exercise when performed correctly. It can improve range of motion of the joint and musculature of the limb. You may allow controlled swimming from 10-12 weeks after the progress check with your vet. This should not involve jumping into/out of the water.
There are now several excellent pet hydrotherapy centres in the UK. Standards can be variable- your local vet will advise you on a good hydrotherapy centre in your area. Generally, a referral is requested. This ensures communication regarding your pet’s condition and allows the hydrotherapist to formulate a suitable program.

**WEEK 12+**

After 12 weeks healing should be complete and your dog can return to full activity. Remember every dog is different. Follow advice from local vet when it comes to long-term exercise advice!

**LONGTERM OUTCOME AND LIFESTYLE**

We expect a good to excellent outcome in over 90% of dogs. The majority of dogs return to a normal level of activity and endurance. On occasion the implants may need to be removed if they cause a persistent problem. Keeping your pet lean is, without doubt, the most useful long-term intervention you can make.

**Important! Weight loss is critical to long-term joint health in overweight dogs.**

All dogs that have cruciate disease will develop osteoarthritis. Glucosamine/chondroitin supplements may have some beneficial effects although this has not been clearly established. In addition, there is some evidence that omega-3 and omega-6 fatty acids (fish oil) in the diet can help. Anti-inflammatory agents often prescribed by your vet for longterm osteoarthritis management. These may be used on a continuous or intermittent dosing regime. They are a very effective medication to control pain and discomfort associated with osteoarthritis. Remember glucosamine / chondroitin and omega-3 and omega-6 supplements are not pain killers and should not be thought of as such. If you think your dog is in discomfort, see your vet.

**COMPLICATIONS**

With any surgery complications can and do occur. Perhaps the most common is something known as a late meniscal tear. This can occur in around 10% of cases and is due to a tear in the cartilage. This causes pain and discomfort. Cases often appear to be doing well but will suddenly become lame again. It is best to see your local vet. Sometimes your dog will require further surgery to remove the damaged piece of cartilage. Despite every attention to sterility, surgical site infections can occur in approximately 5% of cases. These may resolve with antibiotics or require implants to be removed. Rare complications of TTA surgery include a slipping knee cap (0.4%) and tibial fracture (0.08%). Remember at VetFix all of our surgeons are fully trained and audited to ensure they continue to offer the best possible results.

**Be warned!** Rupture of the CCL in the other leg has been reported to occur in over 40% of dogs within two years of the first leg. This can occur more frequently in breeds such as the Labrador. There is little you can do to avoid this but try to be prepared both emotionally and financially!