



Southern Counties

VETERINARY
SPECIALISTS

Cranial cruciate ligament rupture

Information Sheet

**Southern Counties Veterinary Specialists
Specialist Referral Service**

Relevant anatomy

The canine equivalent of the knee joint is known as the stifle joint. It is the point of articulation between the thigh bone (femur) and the shin bone (tibia). The knee-cap (patella) is located in a groove on the bottom of the femur.

The stifle is supported by four main ligaments: one on either side outside the joint and 2 ligaments which cross over within the joint itself (the 'cruciate' ligaments).

The weight bearing surface of the tibia is known as the tibial plateau. It slopes backwards, such that during loading of the limb there is a backwards force on the femur (or, in fact, a forwards force on the tibia).

The cranial (meaning front) cruciate ligament normally functions to prevent these movements between the femur and tibia.

Cranial cruciate ligament disease

When the cranial cruciate ligament fails there is uncontrolled forwards shifting of the tibia during loading of the stifle joint.

The cranial cruciate ligament has a tendency to degenerate in certain breeds, particularly retriever and terrier breeds, and Rottweilers although any breed may be affected. Degeneration of the ligament can occur in dogs as young as 6 months of age, especially in larger breeds.

The cause of degeneration is poorly understood, despite the fact that it is the most common cause of hind limb lameness in dogs. This degenerative process is part of a generalised inflammation within the stifle, which we understand as osteoarthritis. Uncontrolled movement between the femur and tibia causes more inflammation as a result of abnormal loading of articular cartilage.

Occasionally the cranial cruciate ligament is



ruptured during trauma, rather than as part of a degeneration, but this is comparatively rare.

Diagnosis of cranial cruciate ligament disease

Clinical signs are limited to lameness (limp) of varying severity as a result of discomfort and the onset of osteoarthritis. Diagnosis may involve:

- Orthopaedic examination reveals lameness; thickening around the stifle joint; muscle atrophy; discomfort and instability on stifle manipulation.
- Examination under sedation or anaesthesia may be necessary to confirm instability in those dogs that are particularly painful or where instability is mild.
- Radiographs (x-rays) of the stifles will show inflammation in the joint and signs of arthritis. X-ray images also allow measurement of the tibial plateau angle (important for planning of surgery).
- Analysis of joint fluid from the stifle joints may be required to confirm the absence of infection.

Surgery-tibial plateau levelling osteotomy (TPLO)

- There is no way to successfully repair the diseased cranial cruciate ligament.
- Many surgical techniques have been described for management of the cranial cruciate ligament deficient stifle joint.
- Tibial plateau levelling osteotomy is a surgical procedure which addresses functional instability in the stifle. It makes an immediate and permanent change to the biomechanics of the stifle, creating “dynamic stability” (this is explained later).

The initial step in the surgery is to inspect the stifle joint (this may be done by opening the stifle joint or by keyhole surgery (arthroscopy) to remove any remnants of damaged ligament.

Two cartilage pads (“menisci”) in the knee are also inspected as these are damaged in many dogs with cranial cruciate ligament damage. If needed, the damaged part of the cartilage is removed (“meniscectomy”).

Attention then centres on the tibia (shin bone), which is cut in a very precise way to free the top section of the bone (the ‘tibial plateau’). This top section can be moved to a new position that eliminates the backward slope of the tibial plateau (the tibial plateau is ‘levelled’). The bone is secured in its new position with a bone plate and screws.

X-rays are taken after surgery to check that implant-positioning and rotation of the cut section of bone are satisfactory.

When weight is borne on the levelled tibial plateau, there is no backwards slope and therefore there are no forces acting to move the tibia with respect to the femur. The joint is “dynamically stable” despite the absence of a functional cranial cruciate ligament.

Success rate

TPLO is generally very successful with the vast majority of cases improving significantly, within 6 to 12 weeks of surgery.



Osteoarthritis in the stifle is inevitable due to previous instability and will inevitably progress. However, dogs appear to be relatively tolerant of osteoarthritis in the stifle so this is rarely limiting.

Complications

Tibial plateau levelling osteotomy is a major surgery. There are a few potential complications:

Infection. Though uncommon, infection at the surgical site can occur and may necessitate antibiotic therapy and sometimes removal of the plate once healing is complete.

Late meniscal injury. The meniscal cartilages may be normal at the time of surgery, but there is a small incidence (about 3%) of cartilage injury in the weeks, months and years that follow surgery. This can sometimes account for a setback when there has been good improvement initially. Further (more minor) surgery may be needed to deal with the cartilage tear.

Delayed bone healing. Dogs may be progressing well in terms of clinical function, but x-rays can demonstrate slow bone healing. Healing usually progresses with no intervention required, but we may recommend a slower return of activity than routinely in these cases.

Whilst we cannot guarantee that complications will not occur, we do offer a unique guarantee to cover the costs of any complications. Therefore, if you are at all concerned with progress following TPLO we encourage you to get in touch immediately.

Post operative care

- Most dogs are well enough to go home within 24 hours of surgery.
- We supply antibiotic and painkilling drugs.
- Strict rest is essential in the first two weeks and initially we advise restriction to a large cage/ crate or the downstairs with short lead walks in the garden for toileting.
- Most dogs use the leg within a few days of surgery and improve steadily thereafter.
- We usually recommend a recheck with your usual vet after 7-10 days.
- Short lead walks (10 minutes three times daily) and hydrotherapy are usually recommended after 14 days. Lead walks may increase in duration in five minute increments every two weeks.
- At week 8, we normally perform a re-examination and admit the dog as a day patient to obtain x-rays under sedation or anaesthesia.
- We should be alerted sooner if progress is not good or if there are other complications. If all is going well at week 8, we will advise a gradual build-up in activity until a return to normal exercise.





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