

TIBIAL PLATEAU LEVELLING OSTEOTOMY (TPLO)

What is the cruciate ligament and cruciate disease?

The cranial cruciate ligament (CrCL) in dogs is the same ligament known as the ACL in humans. It is common in humans to rupture the ACL from a sporting injury or as a sudden rupture from a trauma. This is not the same as what we see in our dogs where, in most cases, we instead see slow degeneration which eventually leads to rupture. This is what we call cruciate disease. It is important to note that if cruciate disease occurs on one leg, then there is approximately a 50-60% chance of seeing the same issue on the opposite leg at some point in the future.

What can we do about cruciate disease?

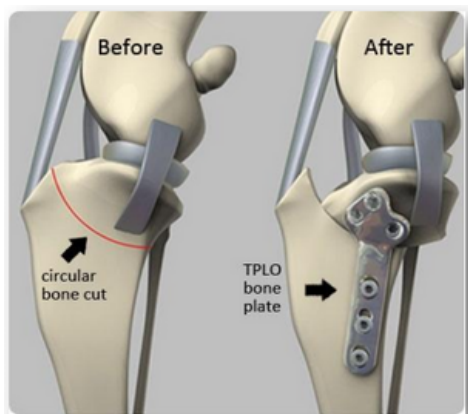
The main goal of managing cruciate disease is to manage pain, now and into the future for your pet. This often involves a combination of lifestyle changes, pain management and surgery to achieve the best results. Lifestyle and pain management are best discussed with your veterinarian as every patient is different when it comes to these factors.

When it comes to surgery; there are many different procedures that have been and are still performed in veterinary hospitals across Australia. This can be very confusing as hearing stories from family, friends and different vets can make it hard to know what to do as each may be slightly different.

The vast majority of research around the world suggests that the best procedure for most patients to achieve the quickest and best return to activity is a Tibial Plateau Levelling Osteotomy (TPLO).

What does the procedure involve?

The goal of surgery is to change the angle of the joint to reduce strain on the cruciate ligament and negate the main force that results on cruciate rupture. This is achieved by performing a controlled, curved cut at the top of the tibia (shin bone) and rotating it to a more level position and then using a bone plate to fix the bone in this new position.



What are the risks of surgery?

There are risks associated with all procedures that are performed in veterinary surgery. It is important to understand the risks associated with the procedure being performed and what that may lead to. When going into orthopaedic procedures, such as TPLO, it is important to consider that some complications can be major and require further surgery if they occur.

Infection

Infection is a potential complication of any surgical procedure. Antibiotics at the time of surgery and sterile surgical techniques ensure that this risk is minimised. Despite these efforts, surgical site infections are still possible. Medical treatment is necessary to control infections when they occur. Infection can delay healing of skin, muscle and bone which can slow down the recovery process. Deep or recurrent infection requires the plate and screws to be removed from a TPLO procedure. This is generally performed once x-ray confirms the bone has healed. If untreated or if the infection is severe, this may lead to non-union or delayed healing (explained later). Severe infection can also increase the risk of implants breaking due to instability it causes. Infection is reported in 3-5% of TPLO cases.

Wound Issues (Swelling/Discharge/Breakdown)

Minor swelling is fairly common after TPLO surgery due to inflammation from the procedure. Discharge may develop as a result of swelling, infection or due to a reaction to surgical implants or suture material. Severe swelling may indicate more serious complications (such as infection or implant breakage). Any swelling, discharge or abnormal colouration at the surgical incision should be reported to your primary care veterinarian. It is also recommended patients wear an elizabethan collar during initial recovery period to reduce any licking or biting at the incision that may increase risk of infection or wound breakdown.



A diagram representing the controlled cut and plate application for a TPLO (left). A post-operative x-ray of a TPLO performed by MoveSx (right).

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Haemorrhage

Haemorrhage (bleeding) is an expected part of any surgery. This is typically minimised and managed with routine surgical techniques. Major haemorrhage is considered rare with TPLO. If major haemorrhage occurs, further medical treatment or bandaging may be necessary.

Neuropraxia and Neurologic Deficits

Surgical procedures performed in close proximity to nerves can result in inflammation/irritation to these nerves. This can lead to a condition known as neuropraxia which can involve altered sensation/feeling, weakness and abnormal function of the nerve. Neuropraxia commonly resolves without intervention over the course of weeks. Permanent neurologic deficits are rare but can occur. Iatrogenic damage (accidental damage associated with surgery) can occur if nerves are located very close to the surgical site.

Implant Failure

TPLO involves the placement of implants which includes a bone plate and screws. Implants can fail in the face of excessive or repetitive stress prior to the bone healing. Failure of an implant is typically when the implant breaks or moves from its original surgical location. If this occurs, bone fragments may shift/move into undesired positions and may result in the bone not healing due to it being unstable and recurrence of clinical signs. This is a very serious complication that may require referral to a specialist institution to correct. Further surgery to remove implants is often necessary if failure occurs. New implants may need to be placed if bone healing has not been achieved at the time this occurs. If untreated, implant failure may lead to non-union or malunion (explained later). Implant failure is more common when post-operative recommendations are not adhered to. We recommend that no unrestricted or unmonitored exercise is performed until 8 weeks post-operatively at which time it is recommended that repeat x-rays are taken under sedation to ensure bone healing.

Delayed Healing, Malunion, Non-union

Delayed healing is where the fracture/bone cut does not heal in the expected time frame but does show signs of healing. This is most frequently seen in geriatric patients or if infection develops at the fracture site. Delayed fracture healing may be managed medically in some cases but some cases do require further surgical intervention.

Non-union is when the fracture/bone cut is not healing and does not appear to be progressing to healing. This can occur with more severe infections of the bone (osteomyelitis) or if the implants fail and lead to instability. Non-union is a very serious complication that requires further surgical intervention.

In the most severe cases, infection or instability can lead to significant bone degeneration that may necessitate amputation. This is a very rare outcome.

Malunion is when the fracture/bone cut does heal but is not aligned/oriented as expected. This typically occurs if the implants have failed to some extent and movement of the fracture has occurred but the bone has then healed in this position. Malunion can lead to worsened long term outcomes, potential ongoing clinical signs and in some cases necessitates further surgery.

Meniscal Injury

The meniscus is a cartilage pad in the knee that acts as a shock absorber and helps provide some stability to the joint. It is common for dogs with cruciate ruptures to develop meniscal tears. At surgery for cruciate disease, the meniscus is always examined. If damage is detected then this will be removed during surgery. Despite successful surgery, meniscal tears can occur in the future although the risk is lower than if surgery was not performed. Meniscal tears are in themselves painful and may be a cause of recurrence of lameness. This does require further surgery to correct if it occurs.

What to expect after surgery

The vast majority of animals will begin walking on the surgical leg within 2 weeks of surgery and this should gradually improve over time. Generally by 8 weeks post-operatively, lameness should be fairly mild if at all present. Structured rest and rehabilitation are vital to a successful TPLO procedure and referral to a rehab vet after surgery should be discussed with your veterinarian.

The plate and screws used in the surgery are left in place unless there are any complications previously discussed.

Arthritis is a common cause of ongoing lameness issues after surgery. Surgery can reduce the progress of arthritis but will not reverse any changes already present. Ongoing routine arthritis management should be discussed with your regular veterinarian.