

TIBIAL PLATEAU LEVELLING OSTEOTOMY (TPLO)

What is a TPLO procedure?

TPLO stands for Tibial Plateau Levelling Osteotomy and is one of the most common back leg surgeries in dogs. This is a surgical procedure used as a treatment option for dogs that have a torn cranial cruciate ligament in the knee (in humans this is known as anterior cruciate ligament or "ACL"). This procedure allows adjustment of the slope at the upper part of the shin bone (tibia) to stabilise the knee joint, which is secured using a stainless-steel plate and screws (figure 1).

Why does my dog need a TPLO?

Inside the knee there is a pair of ligaments, called the cruciate ligaments, that work together to keep the joint stable, and stop the shin bone from sliding forward and back (figure 2). When the cranial cruciate ligament is damaged or ruptured, the knee becomes "wobbly" (the shin bone moves forward; figure 3), causing inflammation and pain of the knee, which leads to a moderate to severe lameness, depending on the number of fibres torn of the cruciate ligament (partial vs complete tear).

In humans, ACL rupture (common in skiers and footballers) is acute and traumatic, but in dogs it has more frequently a degenerative cause. The fibres of the ligament (similar to the threads of a shoelace) begin to fray over time, until it tears completely (complete tear). Sometimes, the ligament is not yet completely torn but still causes pain (partial tear). In mild partial tears, surgical treatment is still advised as the TPLO procedure may prevent further tearing (or fraying) of the ligament in a "non-wobbly" knee. Conservative treatment (pain relief and rest) used to be recommended in the past, but now it is only advised if there are financial concerns, as dogs with mild tears may have a persistent (subtle) lameness, which usually worsens with time due to further fraying of the ligament.

What does a TPLO at Southfields involve?

Dogs with suspected cranial cruciate ligament rupture are seen by our Orthopaedic Service for an initial consultation and clinical and orthopaedic examination. They are typically admitted to the hospital for specific x-rays of both knees under sedation. The x-rays from your local vets are usually repeated at Southfields for pre-surgical measurements and planning. A TPLO surgery is scheduled in the near future, if the x-rays are suggestive of cranial cruciate ligament disease.

On the day of surgery, dogs undergo a general anaesthetic and have their fur clipped from the hip down to the ankle. A cut on the skin is made on the inside of the knee. First, the knee joint is usually explored either with a small camera (arthroscopy) or with a small cut into the joint (mini-arthrotomy). This allows us to check the cruciate ligaments and the menisci, which are two C-shaped cartilage shock absorbers ("cushion pads"). Sometimes, with cruciate disease (in up to 1/3 of dogs), these pads of cartilage can tear (meniscal tear). Any torn or damaged material is removed from the joint space (partial meniscectomy) before the TPLO procedure.



Figure 1:
TPLO implants over
the shin bone; Synthes
brochure[®].

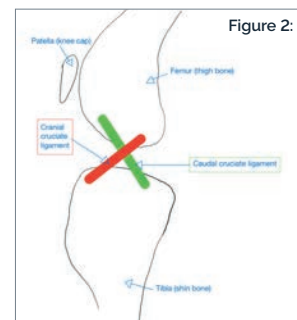


Figure 2:

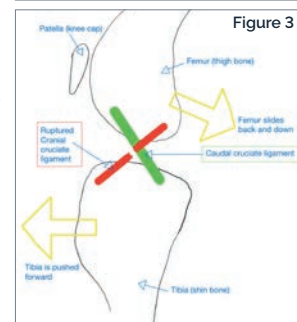


Figure 3

Then, the upper part of the shin bone is cut (osteotomy) with a curved saw, and the top fragment is rocked backwards to adjust the angle of the top shelf (tibial plateau) of the shin bone (figure 4). This is secured with a metal plate and screws. Immediately after surgery, x-rays are taken to check the position of the plate and screws. Some patients may have a light bandage placed for 24 hours. Most dogs recover well from anaesthetic and are discharged from hospital the next day.

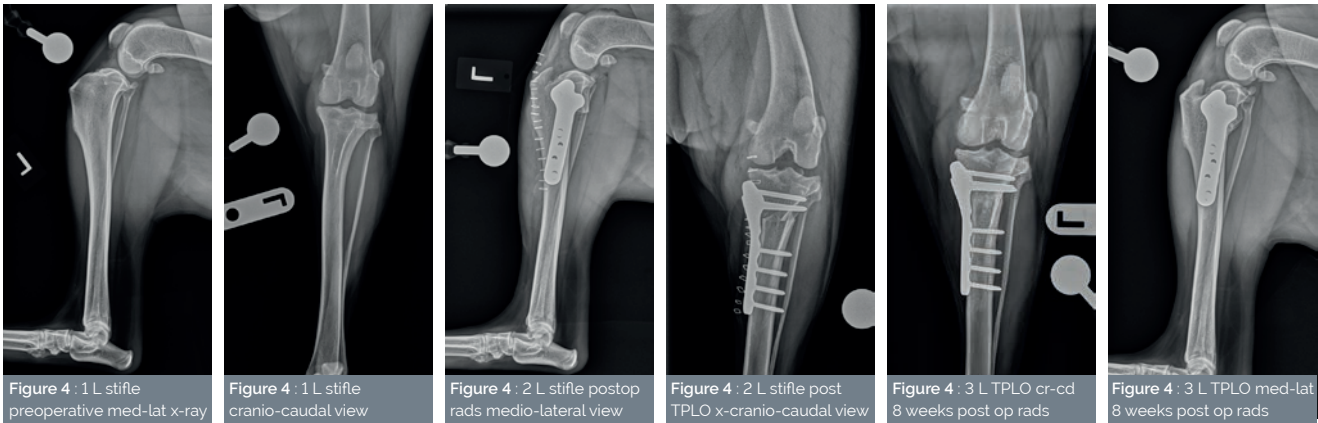


Figure 4 : 1 L stifle preoperative med-lat x-ray

Figure 4 : 1 L stifle cranio-caudal view

Figure 4 : 2 L stifle postop rads medio-lateral view

Figure 4 : 2 L stifle post TPLO x-cranio-caudal view

Figure 4 : 3 L TPLO cr-cd 8 weeks post op rads

Figure 4 : 3 L TPLO med-lat 8 weeks post op rads

What is the aftercare/recovery?

Patients are discharged from the hospital with pain relief medications. Eight weeks of cage/room rest is recommended, with short-lead walks in the garden for toileting purposes (3 to 4 walks of 10 minutes, per day). The surgical wound can take 12 to 14 days to heal, and a buster collar should be worn during this time, to avoid licking or chewing of the skin/wound (which can cause serious complications). A re-examination at your local vet is recommended at 2 weeks to assess the surgical wound and remove any skin sutures/staples.

A follow-up appointment at SFVS is typically scheduled 8 weeks after the surgery to re-assess the knee and take radiographs to assess the bone healing. Patients usually have sedation for this and go home the same day. If all is well with radiographs and clinical signs, a gradual build-up of the exercise is recommended at this stage along with physiotherapy/hydrotherapy if there was severe muscular wastage.

What are the risks?

A TPLO procedure is major surgery and does not come without its risks and complications. Following surgery, infection of the wound and breakdown can occur, which can usually be easily treated with a short course of antibiotics. A sample of the wound (culture) is usually recommended to check that the antibiotic dispensed is effective and we are not dealing with a multi-resistant infection. If the infection was severe, it could deepen into the bone and the soft tissues around the plate (osteomyelitis). This severe bone infection may need to have the implants (plate and screws) removed, in order to sort it out.

Implant failure (such as screw loosening) can occur but is uncommon (as long as the cage rest instructions are followed). One of the most common complications in dogs with undamaged cartilage pads (intact menisci) at the time of the TPLO surgery, is that there is a risk they can become torn at a later date (late meniscal tear). This can present as a sudden, severe lameness and usually requires a second, smaller surgery (arthrotomy or arthroscopy) to remove the damaged cartilage.

The outcome of dogs undergoing a TPLO due to cranial cruciate ligament disease is excellent, and they usually recover uneventfully providing no complications occur. We are expecting most of these patients to return to their normal activity levels between 2 to 4 months after the surgery. However, most of these dogs already have arthritis in the knee joint before surgery, which will not resolve after the operation. However, the TPLO procedure will help to slow down the worsening of knee arthritis in the future. Therefore, a stiff gait can be occasionally seen in the morning due to knee arthritis in some of these patients.