

### COMPLICATIONS

Tibial plateau levelling osteotomy is a major surgery. Though successful in the majority of cases, there are 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.

**Delayed bone healing.** Affected dogs progress more slowly in the initial six weeks. X-rays can demonstrate the slow bone healing. These dogs usually begin to improve in the following six weeks.

**Altered biomechanics.** Altering the shape of the stifle puts additional strain on some other structures around the knee. The body adapts ('remodels'), but this can take several months. Too much strain in the early stages after the operation can lead to damage to some of the other ligaments in the knee, failure of the implants, or even to bone fractures.

**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.

### POST OPERATIVE CARE

- Most dogs are well enough to go home within 24 hours of surgery.
- We supply antibiotic and several painkilling drugs.
- **Strict** rest is essential in the first six weeks and initially we advise restriction to a large cage/ crate or a downstairs room in the house with only the shortest possible lead walks for toileting.
- Most dogs use the leg within a few days of surgery and improve steadily thereafter. Your own vet will normally deal with suture removal (after 10-14 days).
- Short lead walks and hydrotherapy are usually recommended following suture removal.
- At week six, we normally perform a re-examination and admit the dog as a day patient to obtain radiographs 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 six, we will advise a gradual increase in lead-activity. We will then advise a further check at week 14 and if all is going well at this stage we will advise a gradual return to normal activity.

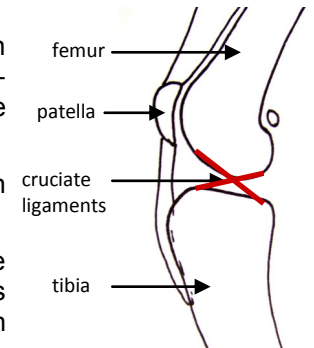
## TIBIAL PLATEAU LEVELLING OSTEOTOMY (TPLO)

### RELEVANT ANATOMY

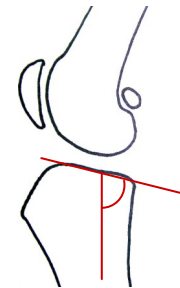
The canine equivalent of the knee joint is known as the *stifle joint*. It is the point of articulation between the thigh bone (*femur*) and the shin bone (*tibia*).

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 (the '*cruciate ligaments*') within the joint itself.



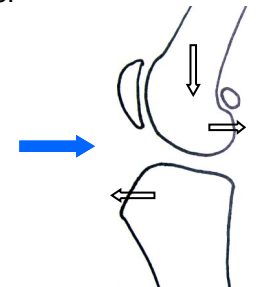
Diagrammatic representation of a side view of the stifle



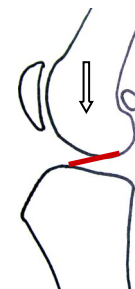
Backwards slope of the tibial plateau.

The back part of the top of the tibia (the weight-bearing surface known as the 'tibial plateau') has a backwards slope.

Therefore, when weight is borne on the hindlimb, the femur is driven backwards and the tibia is driven forwards.



Forces acting on the bones of the stifle during weight bearing.



The cranial cruciate ligament prevents forward movement of the tibia relative to the femur.

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

**When the cranial cruciate ligament fails, the stifle joint becomes unstable.**

### CRANIAL CRUCIATE LIGAMENT DISEASE

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 hindlimb lameness in dogs.

Movement between the femur and tibia causes inflammation in the joint leading to discomfort and the onset of osteoarthritis.

### DIAGNOSIS OF CRANIAL CRUCIATE LIGAMENT DISEASE

- Orthopaedic examination may reveal lameness; thickening around the stifle joint; muscle atrophy; discomfort and instability on stifle manipulation.
- Examination under sedation or anaesthesia may be necessary to reveal instability in those dogs that are particularly painful.
- 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 will confirm the absence of infection.

### SURGERY—TIBIAL PLATEAU LEVELLING OSTEOTOMY (TPLO)

- **There is no way to successfully repair the diseased cranial cruciate ligament.**
- 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).

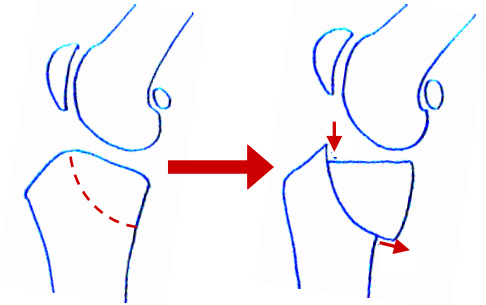
The initial step in the surgery is to inspect the stifle joint (this may be done by opening the stifle joint or by keyhole surgery (arthroscopy) and remove any remnants of damaged ligament. The cartilage pads (“menisci”) in the knee are also inspected as these are damaged in many dogs with cranial cruciate ligament damage. If needed, the damaged part of the cartilage is removed (“meniscectomy”).

### SURGERY CONTINUED

Attention then centres on the tibia, which is cut in a very precise way to free the top section of the bone.

This 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.



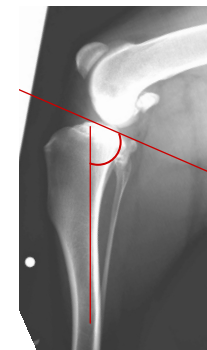
A curved cut is made across the top of the tibia, freeing the tibial plateau which can then be rotated until almost horizontal



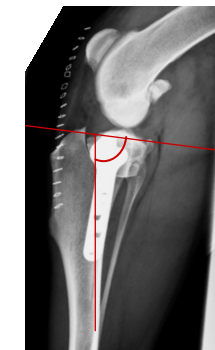
The TPLO bone plate is shaped to fit the top of the tibia.

X-rays are taken after surgery to check that everything is 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” in the absence of a functional cranial cruciate ligament.



Pre TPLO-  
Steep backwards  
angle of the tibial  
plateau



Post TPLO-  
Almost horizontal  
tibial plateau

### 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 (though it is thought that the rate of progression of osteoarthritis is reduced following TPLO).