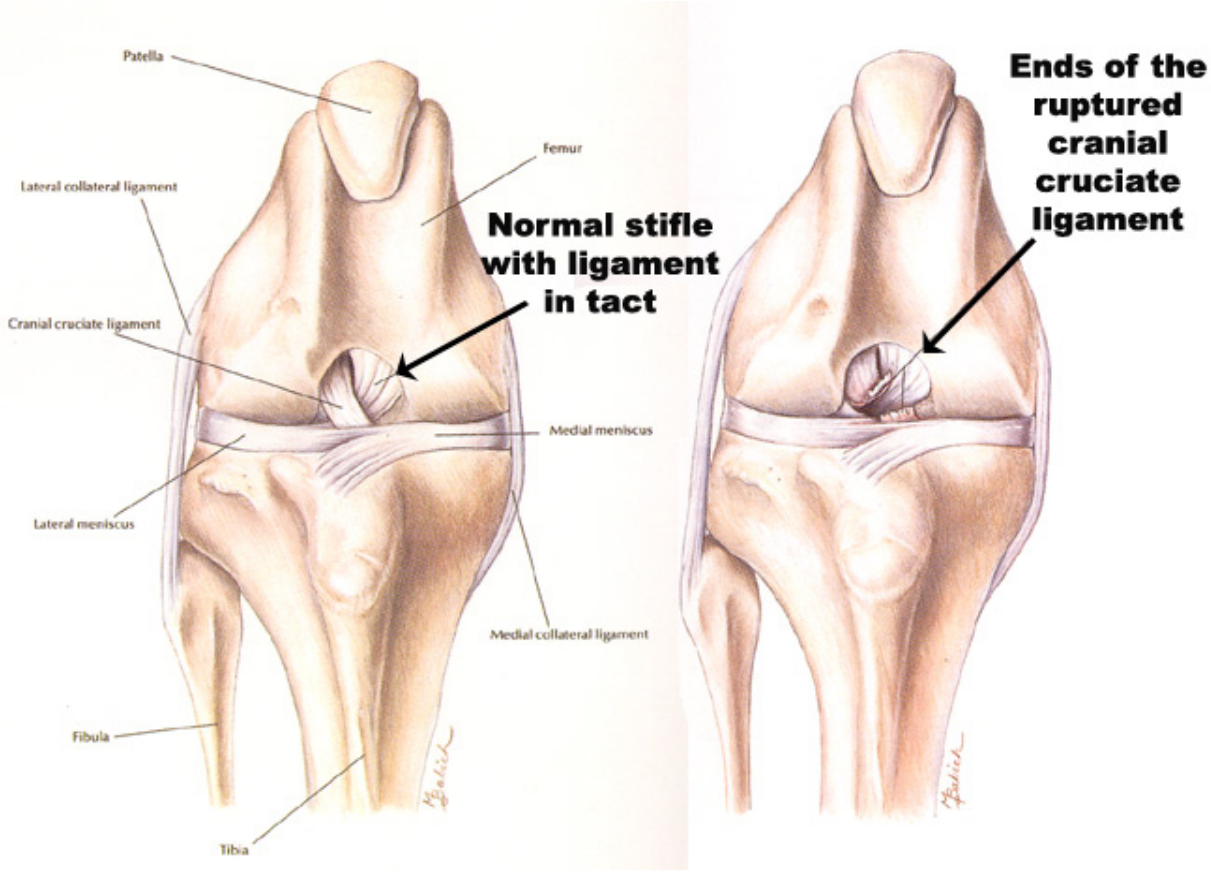
# Tibial Plateau Leveling Osteotomy

Description of Surgical Procedure and Post-operative Instructions for Owners
2021


Yellow Creek Veterinary Surgery
and Imaging
799 Wye Rd.
Akron, OH 44333
330-576-3017

# The Cranial Cruciate Ligament

The cranial cruciate ligament is one of the most important stabilizers inside the canine knee (stifle) joint, the middle joint in the back leg. In humans this ligament is called the anterior cruciate ligament. The cranial cruciate ligament is inside of the stifle joint, and runs from the lateral (outside) part of the bottom

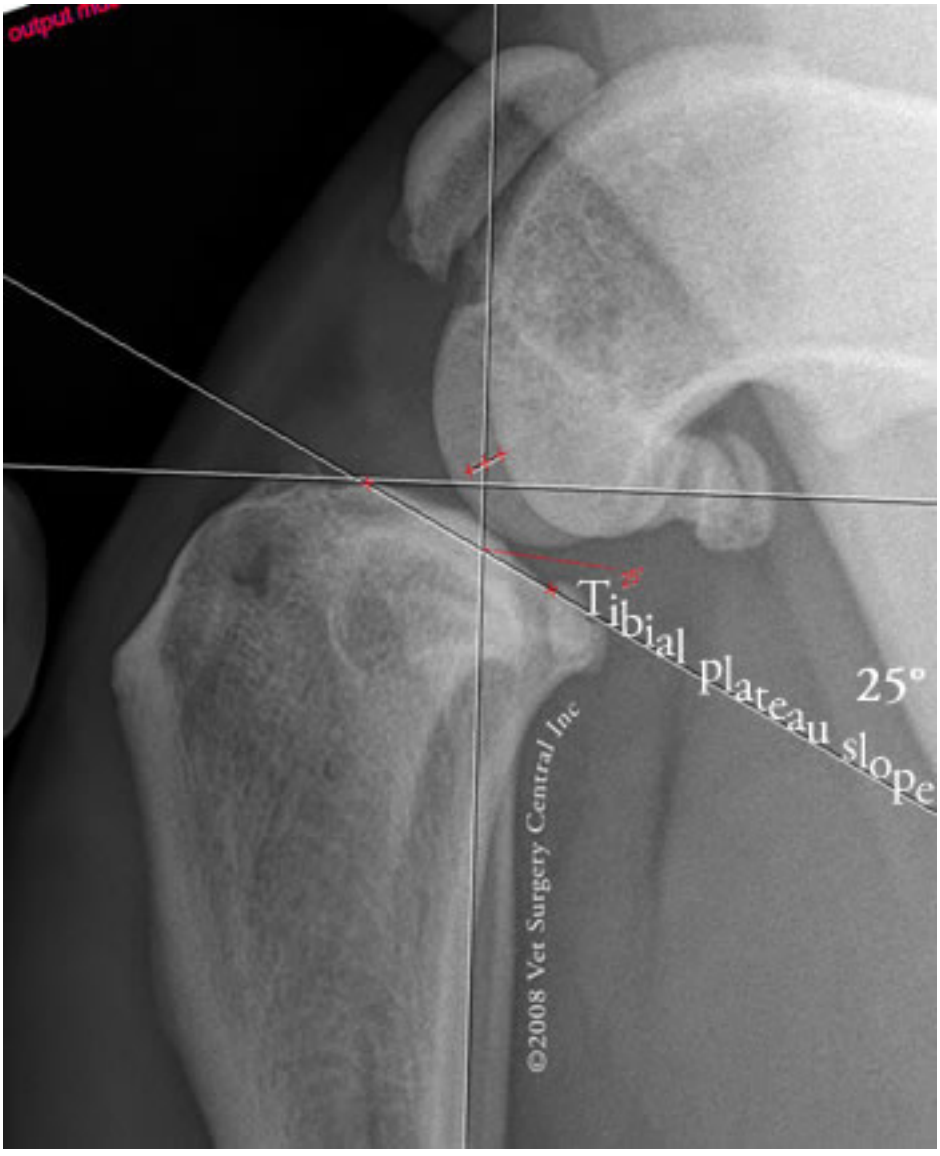



of the femur to the medial (inside) part of the top of the tibia. Because of how it sits in the stifle, the cranial cruciate ligament prevents rotational movement and shearing movement across the knee joint, effectively stablizing it.

CCL rupture is the most common orthopedic abnormality of larger breed and athletic breeds of dogs. When the cranial cruciate ligament is torn, the knee becomes destabilized and

painful to your dog. Normally you will see your dog limping and toe-touching on the affected leg.

Cranial cruciate ligament tears happen for many reasons. These tears can sometimes be acute and related to a specific inury, but most often it is due to the conformation of the bones that make up the knee. Because the top of the dogs tibia is sloped to the back of the knee, the femur tends to slide off the back of the knee during each cycle of the stifles range of motion. (See X-ray)



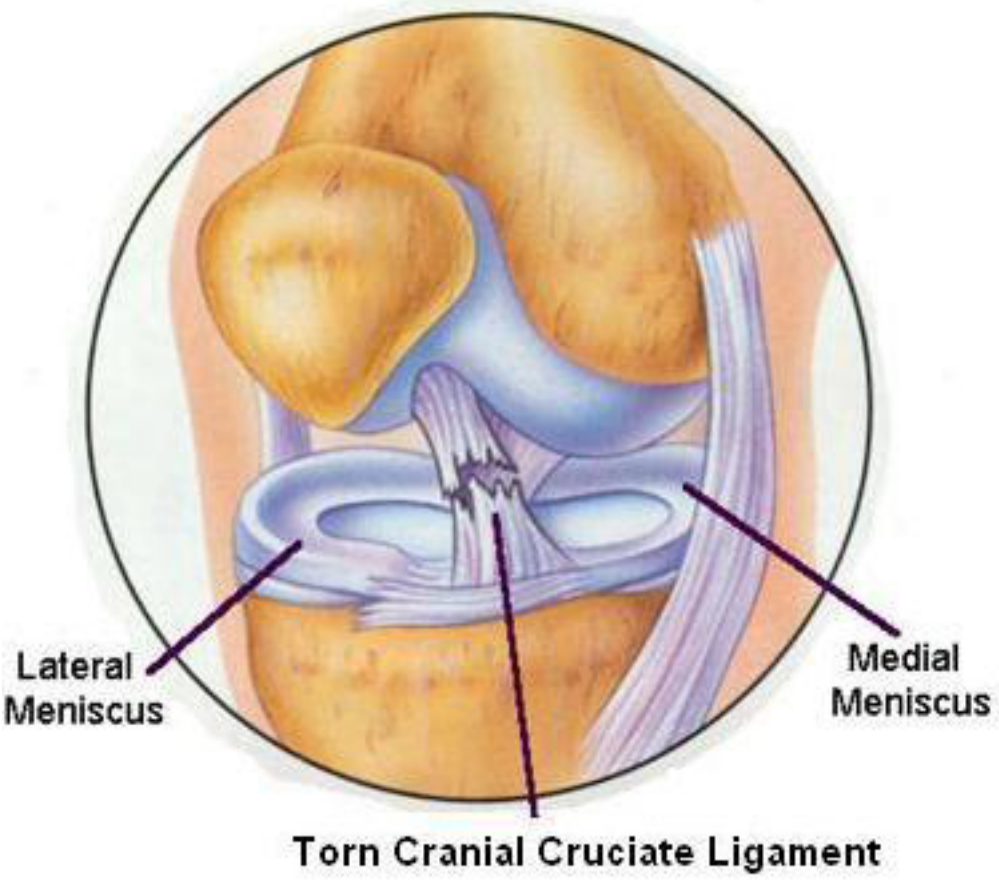
During this abnormal articulation, the cranial cruciate ligament takes repeated trauma over the course of time, especially in large and athletic breeds. After this repeated trauma, at some point in time, the ligament begins to fray and tear, at which point your dog will usually begin to show mild clinical signs, usually intermittent lameness on the affected leg. At first this trauma manifests as a partial tear, but with time will normally progress rapidly to a full tear.

As the trauma in the knee begins to add up, osteoarthritis begins to proliferate in and around the joint making the range of motion around it even more painful. In the picture below you can see the extent to which arthritis can form. Don't worry, not all stifles progress to this level of arthritis. But it is important to correct the ruptured ligament and stabilize the knee as soon as possible so that your dog's knee won't look like this!


**Arthrotomy**

The first step

Before beginning the TPLO we must first debride (clean up) the stifle joint. This is done by way of an arthrotomy: making an incision in the joint capsule and visualizing the interior stuctures of the joint in order to debride any damaged inflammatory structures. These structures include the fragments of the cranial cruciate ligament, free roaming osteophytes that have developed in the joint, and the meniscus.



# The Meniscus

Whether you have chosen TPLO, TTA or an extrapsular suture repair for your dogs knee, it is important to remember that there are other pertinent and extremely important anatomical structures of the knee that may need to be addressed. The meniscus of the knee are the cartilage buffers that sit atop the tibia and cushion the impact from the femur during normal range of motion and everyday activiities. Every time your dog takes a step the meniscus are fundamental to normal function and comfort of motion and movement. As a client it is important that you become familiar with this structure and how it is affected by the deficiency of the cranial cruciate ligament in your dogs knee, and also the procedures that may need to be performed during surgery in order to correct any damage.

1) **Meniscectomy (removal of meniscus due to damage):** Due to a lack of stability that accompanies a torn cranial cruciate ligament in your dogs knee, sometimes the meniscus can tear. This is almost always the caudal medial meniscus which is the part shown on the stifle diagram. At the time of surgery an arthrotomy (knee joint exploration) will be performed. Firstly to clean loose debris out of the joint that may cause inflammation. Secondly and just as important is to look at the meniscus and make sure they are healthy. A meniscal probe will be used in order to thoroughly check for any tears and if any are found the torn portions of the meniscus will be removed at that time.
2) **Meniscal release.** During surgery many veterinary surgeons perform what is called a meniscal release. Basically this is a cut made in the meniscus in order to allow the meniscus to move freely as the femur articulates with the tibia. This cut is intended to stop any future meniscal tears after your dogs knee surgery. After magnification and probing of your dog's meniscus this procedure may be deemed necessary,

especially in cases where weak meniscal attachments are noted.

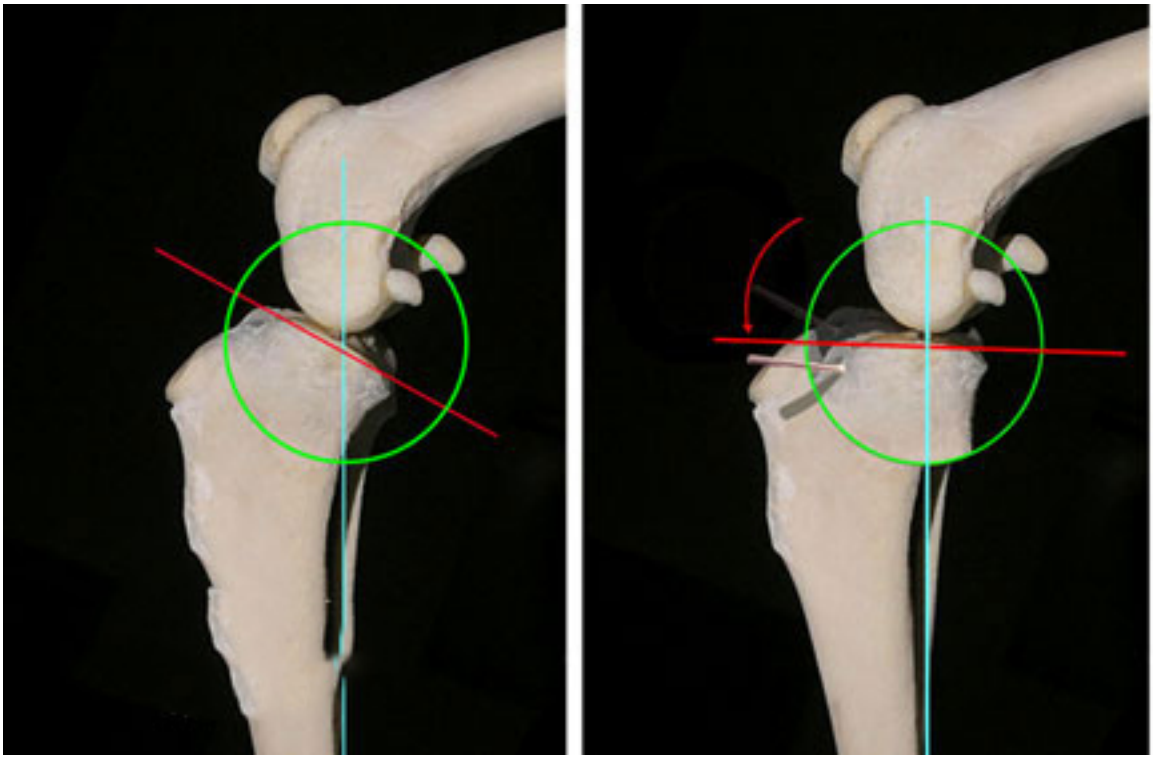
3) **Healthy meniscus.** I leave the healthy meniscus intact during almost all of my stifle surgeries for the reasons stated above. The occurence of meniscal tears after your dogs surgical repair is approximately 2-5%. That's not a large number, but it does happen, and it can happen to your dog. Please understand that this complication can occur in the months following surgery even though we take every precaution to see that it doesn't. In the event that there is a meniscal tear post-operatively you will see your dog become acutely lame on the surgical knee. Please return as soon as possible so we can assess the knee and remove the meniscus if necessary and return your dog to regular and normal ambulation. I realize that this could be another cost burden to you, but I firmly believe it is the right thing for your dog and will help to keep an anatomically correct, happy and healthy knee joint.

# TPLO

## Using the *Tibial Plateau Leveling Osteotomy* to stabilize the cranial cruciate ligament deficient stifle

The rationale for using TPLO is fairly straightforward: to correct the abnormal bone conformation of the sloped tibia that caused the problem in the first place. The TPLO involves creating a semi-circular bone cut (osteotomy) of the proximal tibia (tibial plateau) and rotating it to an angle that is consistent with what should have been it's original healthy angle in the first place (leveling).

After the osteotomy and leveling have been completed, a TPLO bone plate and screws are applied to stabilize the proximal tibia and allow it to heal correctly. For our TPLO surgeries we use only



the highest quality implants made of titanium alloy (Kyon, Boston USA). The design of these plates decreases the possibility of implant failure and post-operative infection.

## Complications

It seems that all too often the possibility of post-operative complications are not addessed adequately. As an owner it is important for you to be aware that complications can and sometimes do occur. The most common complications include implant failure, infection, tibial fracture and implant rejection. Although we strive for a zero percent complication rate, the rate at which these can occur is between 3-5%. In my experience complications are almost always limited to infection and fracture and are almost always secondary to owner non-compliance with post-operative exercise restrictions and rehabilitation. So **PLEASE** read the post-operative instructions ***thoroughly*** and if you have any questions please ask!

## Post-Operative Instructions

### Tibial Plateau Leveling Osteotomy (TPLO)

Historically, rehabilitation on knee surgeries in general has been limited to one common recommendation – *cage rest!* Veterinarians have been reluctant to allow their patients to perform even the slightest of exercise movements postoperative, for fear that the patient will ruin the work (and expense) already performed. If we have learned one thing from human medicine, the sooner the patient is up and using the leg, the quicker will be the recovery. There is only one modification to this thought that should be stated here, if the leg does not hurt, the dog will use it, and premature overuse of the leg will result in critical damage to the proper healing process. We cannot overemphasize enough, ***do not let your dog run loose until the doctor has pronounced the surgery a success.*** **Furthermore, if your dog pulls aggressively on a lead, it is HIGHLY recommended that you buy a gentle leader for them in order to stop this activity, which can be harmful to the TPLO repair.**

**First Two Weeks:** The first couple days when your pet comes home, the pain will be the worst. Why? Dogs are pretty smart, and they figure out right away that when they act like they are in pain, they will get more attention from their owners. It is important to not let your pet loose to run freely, particularly up and down stairs without assistance. They can go outside ON A LEASH to go to the bathroom, and then they must return inside and rest.

(1) First 72 hours – Keep the bandage on as is possible if your dog still has one on. This will help significantly with the swelling. If no bandage is present we have removed it for you before your dog left our hospital. **We would prefer the bandage stay on no longer than 72 hours.** HOWEVER, IT IS NOT AN EMERGENCY SITUATION IF THIS OCCURS OVER A WEEKEND. **If you are having trouble getting the bandage off please return to our clinic DURING REGULAR OFFICE HOURS and we will remove it for you!!!**
(2) Pain medication and antibiotics – as written by the doctor. Please make sure your dog is getting all of the medications that are dispensed. If the antibiotics are not given the possibility for infection increases! If the pain medications are not working, do not overdose, call the office for further recommendations or additional medications.
(3) After 48 hours begin GENTLE range of motion of the leg that was operated on. If you are not clear about this, ASK!
(4) No other exercise is recommended for the first two weeks.
(5) Clean the wound daily **ONLY IF NEEDED** with dilute epsom salts, and do not allow the dog to lick it. If he attempts to lick the wound, please get an e-collar.

**Second Two Weeks:** At this point, walking on leash is tolerated. If your dog likes to pull, a Gentle Leader will help with this. Pulling creates a significant amount of torque on the knee! This should be discouraged at all times during the healing process!

(1) Pain medication – At this point we will decrease the pain medications your dog is using, usually by 1/2 for the next 2 weeks. If you find that your dog is uncomfortable please call the office for further instructions regarding pain relief.
(2) Apply cool epsom salts to the leg for 20 minutes for swelling if necessary, then exercise the leg through range of motion 2-3 times per day if possible.
(3) Walking on a leash is acceptable, but begin with one block and stop. If the dog returns home and is not in pain, you may

increase this in 1 block increments every 4-5 days as tolerated, provided your dog is not in pain when the walk is over.

(4) While walking, push the dog's hips towards the operated leg slightly to help convince him/her that the leg can be used.

(5) Lift the front end of the dog for 5 second intervals prior to starting the walk to increase the strength of the leg. Try several repetitions.

**Third Two Weeks:** By this time, walks should be in the 20 minute range or better, and tolerated well. Do not run yet. Increase the duration of walking as much as you can without causing the dog pain. Do not exceed the 20 minute range. If you have access to a pool, some hydrotherapy is ok, but NOT unattended nor allowed to swim in water over the dog's head. Any hydrotherapy over 10 minutes is more likely to exaggerate patellar tendon inflammation and result in lameness.

**Fourth Two Weeks:** At the end of this period please return for a follow up examination, we want to make sure everything has healed prior to increasing the exercise as tolerated. This MAY require an X-ray to determine healing of the surgical site. If healing is determined to be sufficient it will not be necessary. Be forewarned that if you just go home and turn the dog loose, he will be in pain. This is the point where you can SLOWLY build back up to full exercise.