Lone Star Veterinary Surgical Specialists
Surgical Solutions for Your Loved Pets

Tibial Plateau Leveling Osteotomy (TPLO)
For Treatment of Rupture of the Cranial Cruciate Ligament

INTRODUCTION

Rupture of the cranial cruciate ligament is one of the most common orthopedic conditions in the dog. It is the major cause of arthritis of the stifle or knee joint. The strength of a dog's cranial cruciate ligament can deteriorate with age. Other factors which can contribute to rupture include pre-existing inflammation and anatomical abnormalities such as excessive slope of the tibial bone. Up to 35 -50% of dogs may rupture the opposite leg's cruciate ligament within 24 months following rupture of the first. Often the rupture occurs acutely during normal levels of activity. Your dog may have been jumping off the couch or deck, or running in the yard. Your dog may vocalize and hold up the injured leg. In other cases the rupture may have a more chronic course without a single traumatic event. In these cases your pet may have a chronic, episodic lameness that worsens with vigorous exercise.

The cranial cruciate ligament prevents forward movement of the tibia (cranial tibial thrust), internal rotation and hyperextension of the knee. Rupture of the ligament results in instability of the knee leading to pain, lameness and later arthritis. There are medial and lateral menisci in the knee joint. These menisci are made of fibrocartilage, are crescent shaped and are situated between the femur and tibia. Damage to the medial meniscus, or less commonly the lateral meniscus, is present in a significant number of dogs with cruciate ligament ruptures. The medial meniscus may be torn acutely at the time of the initial cruciate rupture or more often becomes damaged as a result of the chronic instability. An audible click may be heard during flexion and extension of the knee in dogs with meniscal damage. The surgeon will evaluate the meniscus at the time of the surgery and if damaged, a partial or complete removal of the meniscus will be performed. If your dog’s

meniscus is not damaged your surgeon may also perform a procedure called a meniscal release. This procedure makes a small incision across the back part of the medial meniscus and in most cases prevents future tears, and thus prevents future meniscal surgery for this knee.

CLINICAL SIGNS AND DIAGNOSIS:

The diagnosis of a cruciate ligament rupture is based on history, physical examination, and possibly radiographic evaluation to rule out other problems. The history of a complete rupture typically involves an acute onset of lameness after minor trauma. Generally the dog will initially not bear any weight on the leg and will begin to toe touch after a week or more. A partial tear is associated with a less severe lameness.

On physical examination there may be lameness, increased fluid within the knee (effusion), and cranial drawer movement. Such motion is the ability to move the tibia forward while holding the femur stable. It may be more difficult to appreciate drawer in nonsedated dogs, very large dogs, tense dogs or those with partial tears. Another method to evaluate for a rupture of the cranial cruciate ligament is producing cranial tibial thrust.

Once the cruciate ligament tears, it allows the femur to slide down the slope of the top of the tibia (tibial plateau) backwards, and causing the tibia to thrust forward. The TPLO procedure levels this slope and eliminates the tibial thrust. At least two radiographs are required prior to the TPLO procedure. These are used to determine the slope of the tibial plateau and degree of rotation required for correction. In chronic cases of cranial cruciate ligament rupture, arthritic changes may be present on the radiographs.

TIBIAL THRUST

Tibial thrust is a natural force created in the dog's knee with each step taken. The cranial cruciate ligament, when intact, normally limits the amount of cranial tibial thrust (in a forward direction). With the cranial cruciate ligament ruptured or stretched, this thrust is unopposed. This movement results in a great deal of instability within the joint, abrasion of joint cartilage, damage to the medial meniscus, stretch of the joint capsule, and discomfort. These changes ultimately lead to the development of arthritic changes and swelling within the knee joint. In addition, instability within the joint makes walking uncomfortable.

TPLO SURGERY

Tibial plateau leveling osteotomy surgery entails creating a semi-circular, full thickness cut in the tibia. Once the bone has been cut, it is rotated in a calculated manner to level the tibial plateau, thus eliminating cranial tibial thrust. The cut section of bone is then secured back to the tibia by means of a stainless steel bone plate and screws. Healing of the bone takes approximately two to three months. After surgery, your dog's leg might be placed in a padded bandage overnight.