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CRANIAL CRUCIATE LIGAMENT DISEASE

Cranial cruciate ligament disease has become the most common orthopedic condition affecting the dog. Data is not available for cats but it is not uncommon in the feline species. This condition not only plagues the athletic working dog, but the family pet as well. Certain breeds have a very high incidence and recently a genetic predisposition has been suggested. Genetic implications of this disease are being researched. It has far surpassed hip dysplasia as a debilitating orthopedic condition and as a financial burden to pet owners.

Diagnosis of cruciate ligament injury with stifle instability is proving to be very complex. For years we have believed the only test for stifle cranial cruciate instability was the “drawer sign”. We now know that cruciate disease is not usually an acute event with rupture as it is in man (quadruped vs. biped). It is now believed to be the result of degenerative changes that occur over time. It appears that the development of instability it is more chronic in nature and with initial stretching to mild ligament fiber separation. It appears that ligament degeneration with histopathological changes within the ligament fibers precedes overt clinical signs of instability and joint discomfort.

That initial presentation of discomfort and lameness that we see with no “drawer sign” may just be a stretching of the ligament or a mild tear (fraying of fibers). This may respond to rest or anti-inflammatory therapy. A repeat of discomfort often occurs that may or may not be responsive to conservative therapy again. The process has started from an early stretch to a partial and to an eventual complete tear. This degeneration and stretching eventually allows synovial fluid entrance into the ligament with inflammation. It can then progress to partial fiber separation and tearing long before an acute event occurs. During this long process stifle instability is present (even without a visible drawer sign). You cannot detect this instability with the drawer test. Synovial membrane attachments are torn and osteoarthritis is developing. Articular cartilage is under attack by this abnormal stifle movement. By the time you detect the “drawer sign” osteoarthritic changes can be evident and often can be severe.

Conformation issues (straight stifle and steep tibial plateau angle) are also mentioned as predisposing factors to cruciate ligament degeneration and rupture. Since these issues affect both joints it has become increasingly clear that bilateral disease is the norm and the second leg often follows with similar discomfort and degeneration issues.

The classic history that is received today on the stifle injuries that are seen is chronic long term rear leg discomfort (lameness) that often responds to rest and/or anti-inflammatory treatment (initially). It is recurring and often frustrating to pin point the painful area. Radiographic evaluation of the stifle early is not contributory to the diagnosis of cruciate disease. Early joint changes are mild and not detectable on radiographs. As the changes in the joint progress from this early lameness (instability), changes do occur that are subtle but very contributory to a diagnosis. The body responds to this joint instability (though mild) by building a fibrous medial buttress around the medial collateral ligament. This is often palpable early but can be very subtle. It can be very mild and you must compare to the opposite “normal” joint. You also can often detect increased synovial fluid in the affected joint on the lateral stifle radiograph. Again you must compare to the “normal” unaffected side to detect slight differences. Early arthritic change (patellar spike) can often be seen. You should also compare drawer sign for differences between the affected and normal leg. Combining all of this information can give you a good probability that you are dealing with cruciate disease as the cause of the rear leg lameness or discomfort. Stifle thrust is usually only detectible with significant instability (severe partial or total tear). With longer standing issues muscle atrophy on the affected limb becomes apparent.

This all is complicated by the fact that chronic cruciate disease is often bilateral and the two legs may be at different stages in this degenerative process. They may both have issues with one being farther along and “more” clinical.

Medical therapy (rest, NSAIDs, and physical therapy) in these early stages does not halt this process. You mask signs of the instability but it is still present and is causing damage. We are beginning to recognize that early surgical intervention may be necessary to correct this instability and halt this osteoarthritic progression. Early surgical intervention increases the chances of saving the medial meniscus from damage.

The Stifle Joint:

The important structures in the stifle that are of concern to us are the cranial cruciate ligament and the medial meniscus. The abnormal joint movement that results from damage to the cranial cruciate ligament (cranial translocation and internal rotation of the tibial plateau relative to the femoral condyles) occurring during “stepping” pressure on the foot can put the fixed caudal horn of the medial meniscus at risk for damage by the medial femoral condyle. As the tibia slides forward with foot pressure the caudal horn of the medial meniscus can be crushed and pulled forward from its normal position. Several lesions in the caudal horn of the medial meniscus have been described. The result is that the caudal horn of the medial meniscus is now abnormal and it positions itself between the medial femoral condyle and the medial tibial plateau in an abnormal fashion. This causes pain and discomfort with pressure. The caudal horn can move into and out of this position. Eventually it fixes itself and this significantly contributes to stifle discomfort and lameness (stone in your shoe effect).

Stifle Evaluation:

Any repair of stifle instability requires examination of the joint for evaluation of the damage that is present and possible remedial repair. Arthroscopy is the least invasive technique used to evaluate for damage in a stifle. It has limitations in availability and in patient size for effective use. The equipment is expensive and is generally only available in tertiary referral institutions. Most veterinary surgeons use exploratory arthrotomy for joint evaluation. The damaged ligament is debrided and removed. The medial meniscus is evaluated for injury. Several techniques are employed to deal with caudal horn medial meniscal issues. Mid medial meniscal caudal horn release, rear caudal horn release, caudal horn removal and total medial meniscal removal are all recognized and

utilized in treating medial meniscal caudal horn damage or in releasing the caudal horn from the possibility of future damage. The technique employed by VSSON depends on damage assessment and the corrective procedure being employed to stabilize the stifle joint.

Stabilization Techniques Utilized by VSSON:

Tibial Plateau Leveling Osteotomy

TPLO by Barclay Slocum with SLOCUM ENTERPRISES

Tibial Tuberosity Advancement

TTA by Pierre M. Montavon, Slobodan Tepic with KYON

Extracapsular Isometric Reconstruction

Martin P. DeAngelous with SECUROS and others):

Extracapsular Isometric “Tightrope” Reconstruction

James L. Cook with ARTHRIX

Each technique has its “Pros” and “Cons.” All are available through VSSON and the right technique is used for the animal being evaluated, the desire of the client and their veterinarian.