

## **The Equine Stifle - The Importance of Diagnostic Imaging**

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For the sport horse, lameness comes as an inconvenience not only in days lost for training and competition, but also in loss of potential earnings. It is however, often inevitable depending on the horse, its fitness, conformation, and level of work. Mild lameness problems associated with 'wear and tear' are, to a certain degree, "expected", but others can be more persistent and associated with the bone or soft tissues for which the horse is often out of work for several months.

Like the human knee, the equine stifle is a complex, high motion joint that suffers a variety of ailments that have the potential to affect athletic performance. These include injury to the meniscus, the collateral or patellar ligaments as well as the cruciate ligaments. Unlike humans however, these structures are difficult to treat and can take a long time to resolve. Typical gait abnormalities associated with stifle lameness includes a grade 2-4/5 lameness characterized by a prolongation of the caudal phase of the stride; that is, the horse is somewhat reluctant to advance the limb forward after the end of the stride/foot lift off. While this is true for many horses with stifle lameness, it is not always the case, necessitating a thorough diagnostic work up.

Radiographs are most often used to image the stifle, but may reveal only the 'tip of the iceberg'. Radiographs are not capable of assessing soft tissues, as can ultrasound and MRI. Unfortunately few MRI units have the capability to image the equine stifle, leaving ultrasound as an important imaging tool. If radiographs identify change in the bone associated with the attachment of a ligament (enthesiophyte formation), or if a subchondral bone cyst is identified, ultrasound is warranted to assess the soft tissue structures.

The menisci are fibrocartilagenous pads present in the medial and lateral compartments of the femorotibial joint between the tibia and the femur. They provide important shock absorption, and some stability within the joint. Meniscal injury can come from a variety of causes; 'wear and tear', direct trauma, secondary to ligament laxity, and from abnormal stresses in the stifle that can be primary or secondary to other issues such as osteochondrosis and subchondral bone cysts. With trauma to the meniscus, stability of the joint is affected which then leads to osteoarthritis and lameness. Injury to the medial meniscus associated with subchondral bone cyst formation in the medial femoral condyle is a significant cause for concern. In a recent study horses were found to develop medial meniscal damage as a result of the cyst after surgery, concurrently with the cyst, or conversely prior to the cyst becoming apparent. Which develops first has not yet been determined. However, one needs to be cognizant of the fact that if there is evidence of a cystic lesion on radiographs, an ultrasound examination of the stifle should be done to assess the status of the meniscus and its attachments before surgery is considered.

The unfortunate thing with horses is the poor surgical accessibility of the structures in the stifle. The cranial edge of the meniscus is visible, as are the cranial ligamentous attachments, but the body, and caudal attachments are almost impossible to reach, making repair and complete assessment difficult. Similarly, only portions of the cruciate ligaments can be accessed with the arthroscope. Subchondral bone cysts are easily seen in the femur and can be treated at surgery, with various methods being used with equally variable results. Is it futile to take these horses to surgery? Some may argue that it is. However, the ability to assess even a portion of the meniscus or cruciate ligaments and to debride the torn fibers makes this a good option. It also allows the surgeon to evaluate the cartilage surfaces, and formulate a treatment plan and prognosis for return to athletic performance.

What do we do when we're faced with meniscal or cruciate injury? Prognosis is guarded for return to the former level of performance depending on the degree of damage. Regenerative treatments such as mesenchymal stem cells and/or PRP have been used with varying success. At this point in time, there is little data to support or refute the use of such treatments, but there have been some promising reports supporting intralesional stem cell therapy for the treatment of damaged menisci. Intra-articular IRAP/Stem Cells/PRP and/or Hyaluronic Acid have also been advocated. Intracystic steroid administration is the current treatment of choice for subchondral bone cysts and can be done with ultrasound guidance.

The 'take home' message here is that the equine stifle is prone to problems that can cause significant lameness, and that need aggressive evaluation and treatment, especially in regards to the meniscus and its associated ligaments. Radiographs alone do not always provide all the information about the status of the structures in the joint. Ultrasound examination of the stifle by an experienced imager should be considered seriously as part of a complete, detailed assessment of this high motion joint, especially if some bone changes have been identified on radiographs.

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