EQUINE STIFLE COMPUTED TOMOGRAPHIC ARTHROGRAPHY (CTR)

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Arthrography is a diagnostic imaging technique that was used for many decades to enhance visualization of intra-articular structures not apparent on plain radiography. As ultrasonography and magnetic resonance imaging (MRI) became more available in veterinary medicine, the use of arthrography declined. In general, ultrasonography and MRI have become the modalities of choice for imaging soft tissues. However, like any imaging modality, both have advantages and disadvantages.

Ultrasonography is frequently used to diagnose many musculoskeletal diseases in horses, including pathologic changes affecting the stifle. Advantages of this modality include the ability to perform the exam on a standing horse with minimal sedation and being able to use dynamic examination with flexion and extension of the limb for real time imaging in different positions. Furthermore, if performed by a skilled sonographer, the results of a stifle ultrasound examination are usually rewarding. However, it is well documented that ultrasonography of the equine stifle joint has limitation when evaluating some of the intra-articular soft tissue structures, i.e. cruciate ligaments and some regions of the menisci.

MRI gives excellent contrast resolution of soft tissues and provides multiple plane visualization of all anatomical structures that comprise the stifle joint. Unfortunately, MR imaging of the equine stifle is limited due to magnet bore diameter and length. Most MR systems do not allow the limb to be placed far enough into the magnet to properly image the stifle. In addition, MRI has the greatest anesthesia time and cost when compared to other modalities.

Computed Tomography (CT) has been increasingly utilized in some veterinary institutions for evaluation of the equine appendicular skeleton, including the stifle joint. In the last few years, the development of helical scanners with multiple rows of detectors has resulted in much faster scan times. Additionally, the capability of submillimetric image acquisition and isotropic (identical spatial resolution in all dimensions) or near isotropic multi planar reconstructions (MPR) has greatly improved the spatial resolution on MPR images. Unfortunately, visualization of the soft tissues with CT is limited and commonly unrewarding without the use of intra-vascular or intra-articular contrast. Computed Tomographic Arthrography (CTR) is an imaging technique that uses intra-articular administration of contrast to improve visualization of the intra- and peri-synovial soft tissue structures. The contrast medium will diffuse within the joint compartments making the soft tissue structures more conspicuous. The soft tissue structures appear as filling defects outlined by the contrast in the joint. CTR is used to identify abnormalities in the articular surfaces, intrasynovial soft tissue structures, synovial surface of the joint capsule and peri-articular structures that have a close relationship with the joint compartments. The contrast will outline
structures and reveal abnormalities in size and shape. Contrast will enter tears or defects demonstrating injury to soft tissue structures or articular surfaces.

CLINICAL INDICATION FOR STIFLE CTR

Stifle CT allows visualization of the entire joint, giving excellent information regarding bony changes. With the addition of CTR the ability for evaluating the internal soft tissue structures is greatly increased. Stifle CTR is indicated in cases with lameness localized to the stifle that cannot be explained by other imaging modalities (radiography and/or ultrasound), and when a better understanding of the internal condition of the joint is needed for case management and prognosis.