The stifle is a significant source of equine hindlimb lameness. Unlike other species, equine stifle injuries can be difficult to diagnose. Traditionally, the use of radiology and arthroscopy in addition to a physical exam, have comprised the diagnostic evaluation for equine stifle pathology. However, these modalities have limitations in their ability to detect particular stifle injuries.

While survey radiographs provide superior examination of bony lesions, they provide minimal information about soft tissue structures (Dik, 1995). Furthermore, the use of double-contrast arthrography does not appear to aid in the diagnosis of equine stifle injuries (Nickels & Sande, 1982). The radiographic findings of meniscal injury are non-specific and there is minimal correlation between radiographic findings and arthroscopic findings (Koneberg & Edinger, 2007) (Desjardins & Hurtig, 1991). While the value of radiography in the identification of soft tissue injuries themselves is minimal, it may provide complementary information when performed in addition to ultrasound and can be beneficial in determining prognosis in more chronic cases (Dik, 1995) (Penninck, 1990) (Walmsley, 2003).

The use of arthroscopy in the diagnosis of equine meniscal lesions has greatly increased the frequency of their diagnosis. Arthroscopy not only provides an opportunity to diagnose meniscal tears, their etiology and morphology, but it is also provides the advantage of treatment and assessment of prognosis. However, arthroscopy has its own inherent limitations to the extent in which it can be used to examine in the equine stifle in its entirety (Walmsley, 2003, Barrett, 2012). Only the cranial and caudal aspects of the menisci are accessible by arthroscopy (Walmsley, 2003). Despite a number of arthroscopic techniques that have been researched to improve access to the central portions of the femorotibial joint, most have been deemed too invasive. Thus, injuries at this location often remain undiagnosed and untreated (Walmsley, 2003). This lack of access is a direct result of the narrow joint space of the equine femorotibial joint. This anatomy makes orientation and manipulation of instruments difficult and effectively limits the arthroscopic examination of the stifle to the cranial and caudal aspects of the meniscus (Moustafa, 1987). Even with the stifle in the semi-flexed or maximally flexed position which provides an optimal view of the more cranial portions of the meniscus, a large portion of the meniscus still cannot be observed (Nickels & Sande, 1982). While arthroscopy provides the most complete information as a single diagnostic modality, there are still meniscal injuries that remain inaccessible using this technique. Furthermore, even if an injury is viewed during an arthroscopic exam, the extent of the damage often cannot be completely ascertained using this modality. Thus, the use of ultrasonography to detect these meniscal and other soft tissue lesions that are inaccessible by arthroscopy is proving to be worthwhile.

The low cost and non-invasive technique of ultrasound allows for a more complete evaluation of the meniscus including its internal architecture. Comparatively, arthroscopy doesn’t allow for evaluation of such changes (Denoix, 1996). The problem of artifact that may lead to misdiagnosis when utilizing ultrasound can be minimized by comparing multiple views,
selecting an appropriate probe and angling the probe perpendicular to the meniscal fibers to allow for adequate evaluation of pathology (Hoegaert, 2005). Ultrasound is able to detect lesions as small as 2mm in both menisci and the use of 3D ultrasonography further increases the ability to detect specific meniscal injuries (Koneberg & Edinger, 2007). Ultrasound is able to detect a wide variety of meniscal injuries including: modifications in shape, calcification, tears and enthesophytes in the attachments, fibroplasia, extrusion or fragmentation, separation from the collateral ligaments, tears in the meniscal ligaments and collapse of meniscus leading to loss of the joint space (Denoix, 1996) (Walmsmsley, 2005). Several studies have concluded that ultrasound is more useful than arthroscopy in detection of certain meniscal injuries, however; there is evidence that the reverse is also true, in that certain meniscal injuries are only identified using arthroscopy. (Schramme, 2004). In addition, ultrasound can used to evaluate the collateral ligaments, cranial tibial meniscal ligaments, synovial recesses and small portions of the cruciate ligaments. While ultrasound provides a rapid, less expensive and less invasive means of soft tissue injury detection, it is evident that diagnosis of these injuries may well prove challenging to a novice ultrasonographer (Walmsmsley, 2005). Therefore, further evaluation of the sensitivity and specificity of ultrasound as a primary diagnostic tool for soft tissue injuries of the stifle is warranted.

Advanced imaging, such as CT and MRI, provides diagnostic information about soft tissue and osseous injuries of the equine stifle that are not possible with other modalities. Although general anesthesia is required, the additional information is often extremely valuable to case management. MRI and contrast arthrography allows visualization of the cruciate ligaments. However, CT is limited to identifying abnormalities in size, shape and margins as well as tears that communicate with the joint. Similar limitations are present when considering evaluation of the articular cartilage. CT is limited to the diagnosis of articular cartilage defects, fissures and thinning, while MRI demonstrates intrasubstance abnormalities that are not possible with CT. When CT is utilized, the examination time is short and often these cases can go directly to arthroscopy following imaging. While large bore CTs make positioning of the stifle for imaging quite possible, positioning for MRI is considerably more challenging and often impossible with shorter horses that have prominent gluteal musculature. MRI provides unparalleled soft tissue detail and allows detection of fluid in bone, which is not possible with CT.

References


