Key Points:

- Management of meniscal injuries continue to be a challenge for equine clinicians
- Exploratory arthroscopy is recommended in cases with lameness localized repeatedly to the stifle but where other imaging modalities have yielded inconclusive results, or cases that have failed to respond to traditional medical management
- Prognosis to return to athletic soundness is related to the severity of the meniscal injury and other concurrent joint pathology such as the degree of osteoarthritis

Stifle injuries are common in the equine athlete. The equine stifle is a complex structure which is divided in three joints: femoropatellar, and lateral and medial femorotibial joints. The femorotibial joints are further divided in cranial and caudal compartments (or pouches), where the menisci and cruciate ligaments are located. Conditions commonly associated to the stifle include degenerative joint disease or osteoarthritis (OA); osteochondral fragmentation, either traumatic or due to a failure of endochondral ossification (Osteochondritis Dissecans); subchondral bone cysts (SBCs); and meniscal and cruciate ligament tears. Other conditions seen include patellar and collateral desmitis.

Over the past 20 years, considerable strides have been made with regards to the diagnosis and management approaches to conditions affecting the menisci and its associated ligaments within the equine stifle. This has been made possible in part thanks to significant improvements in the diagnostic capabilities available, especially in the area of diagnostic ultrasound and more recently with MRI. However, the use of exploratory arthroscopy remains the ultimate diagnostic modality available, which in turn can also provide a therapeutic option. The aim of this presentation is to discuss the diagnosis and management of meniscal injuries in the equine athlete.

Diagnostic Modalities

Regardless of the diagnostic tools or equipment available, it is imperative that a thorough physical examination together with a lameness evaluation, both in-hand on a straight line as well at a trot and canter on a lunge line, and diagnostic anesthesia be performed. Radiographs and ultrasound are a traditional first line of diagnostics used by most equine clinicians. However, although there have been significant advances in the quality of conventional diagnostics such as digital radiography and ultrasound, conditions such as meniscal and cruciate tears can continue to be a challenge to properly diagnose by these methods alone due to the variability of location, complexity and operator expertise. A good example of this was demonstrated by Cohen and colleagues (2009) who reported on their findings in 44 horses suffering from lameness localized to the stifle and which were evaluated arthroscopically. Their study reported a sensitivity of 79% with a specificity of 56% for identifying meniscal injuries ultrasonographically prior to surgery. Despite its limitations, we strongly believe that ultrasound examination is a key component of thorough stifle examinations in order to either arrive at a final diagnosis or a way to gather the information necessary to justify other diagnostic modalities, such as exploratory arthroscopy. Currently ultrasonographic examination of the stifle
is performed routinely at our hospital, having been especially useful and critical during the work up of patients with moderate to severe lameness (grade 2 and above) localized to this joint.

The use of nuclear scintigraphy (bone scan) for evaluation of the stifle can provide objective means of assessing bone activity in this region\(^4\). It has a sensitivity much greater than that of digital radiography since the radiopharmaceutical uptake (hot spot) is related to the osteoblastic activity of the bone. However it lacks specificity, meaning that it is important to use it in conjunction with other diagnostic modalities such as radiography and ultrasound. In our experience when evaluating the stifle region scintigraphically, it is extremely important to obtain an accurate caudal projection, especially when dealing with middle aged horses and Warmblood breeds. The medial aspect of the image will be rather ill defined in normal horses but in affected animals the medial condyle of the femur as well as the medial plateau of the tibia will become apparent with a range of mild diffuse (subchondral inflammation or trauma and/or early OA) to marked focal uptake (advanced OA and/or SBCs). These abnormal changes, in particular in patients showing only mild radiopharmaceutical uptake will not be as apparent in the lateral projection of the stifle. Due to the mechanics of the stifle together with the amount of mechanical trauma that it is subjected, scintigraphic abnormalities in this joint, even if mild, are often of clinical relevance.

The use and availability of MRI as a diagnostic tool for the evaluation of conditions affecting the equine distal limb continues to become more and more commonplace at both academic institutions and private practices alike. Although possible, examination of the stifle using this modality is difficult and only can be performed if the patient is of certain size and width, and using a gantry of adequate size\(^5\). In those cases where this modality is possible however, it provides an accurate and thorough evaluation of bony and soft tissue structures alike. With the continued development of MRI scanners, it is very likely that this diagnostic modality will gradually become more available to use in this region.

Exploratory arthroscopy can have both a diagnostic and therapeutic value. It allows for the evaluation of articular cartilage defects, cruciate ligament injury, as well as examination of the medial and lateral menisci. Due to the narrow architecture of the femorotibial joints together with the stability provided by the abundant peri-articular soft tissues, examination of the cranial and caudal pouches requires separate approaches\(^6-8\). Although its use can be technically demanding, in our experience is the diagnostic modality of choice in cases where: other diagnostic modalities have yielded inconclusive results or failed to reveal an abnormality despite having the lameness localized to this joint repeatedly, and in cases which medical management has not been effective or has only achieved transient results.

**Therapeutic Management**

**Meniscal Injuries**- In the past, meniscal injuries in the equine athlete were thought to be basically always career ending. Although certain injuries can in fact end a horse’s athletic career, mild to moderate injuries (depending at times on the location) can be managed successfully with arthroscopic debridement\(^3,9\). Meniscal injuries or tears are generally graded following the classification published by Walmsley and colleagues (2003): I- a tear in the cranial ligament extending into the meniscus but without significant separation of the tissues; II- a complete tear in the cranial pole of the meniscus and the cranial ligament, whose limits are visible arthroscopically; III- a severe tear of the meniscus and cranial ligament which extends beneath the femoral condyle and whose limits cannot be seen\(^9\).
In our experience and that of others, exploratory arthroscopy is indicated in horses with suspected injury to the meniscus based on ultrasonographic examination or in those cases where the lameness has been localized to the stifle but no abnormality can be identified using conventional imaging (including nuclear scintigraphy). The goal of the surgery is to debride the meniscal injury in order to remove exposed collagen (present within the cranial meniscotibial ligament and menisci proper) which is foreign to the normal articular environment, and to allow a more adequate repair of the affected tissue. In our hospital this is done routinely using a combination of synovial resectors and radiofrequency probes. The use of sutures repair systems, although available and used on occasions depending on the configuration of the lesion, are not routinely used in part due to unique limitations encountered when dealing with equine patients (weight, torque, immediate weight bearing, etc.) and also due to the lack of objective evidence regarding its benefits versus debridement alone (or in combination with other therapies such as the use of biologics).

The use of orthobiologics (stem cells, platelet rich plasma [PRP] and bone marrow aspirate concentrate [BMAC]) for the management of lesions associated with the menisci and meniscotibial ligaments, either intra-lesional or intra-articularly following surgery, has been advocated for a number of years. Although there is encouraging evidence with regards to the benefits of this treatment option in non-equine species\(^{10,11}\), objective data in equine patients is lacking\(^{12,13}\).

**Outcome**

Prognosis is dependent of the severity of the meniscal injury and degree of pre-existing joint pathology (osteophytes and articular cartilage lesions). In general, horses with meniscal injuries carry approximately a 45-47% prognosis for return to soundness or full use\(^{3,9}\). However it most important to keep in mind that the prognosis changes significantly as the severity of the meniscal injury increases. Walmsley and colleagues (2003) reported that 63% of the horses with a grade I, 56% with a grade II, and 6% with a grade III returned to full use\(^9\). Cohen and colleagues (2009) reported that none of the 4 horses identified with a grade III tear returned to their previous level of soundness\(^3\).

References: