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Multiple Problems in the Medial Femorotibial Joint

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_Take Home Message_—There are numerous bone and soft tissue structures within the medial femoral tibial (MFT) joint that can result in lameness in many types of performance horses. Being able to palpate the MFT joint, perform intrasynovial anesthesia, and adequately image the stifle are often critical for an accurate diagnosis. A wide range of clinical conditions can occur and sorting them out is important to develop treatment strategies and to make an accurate prognosis.

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I. INTRODUCTION

The medial aspect of the stifle is a common site for both developmental problems and traumatic injuries. Osteoarthritis (OA), meniscal injuries, and subchondral cystic lesions (SCL) are far more prevalent in the medial femorotibial joint (MFT) than the lateral femorotibial joint. In addition, the medial aspect of the stifle is often the first site of problems in many Western performance horses. Therefore, close evaluation of this joint is critical for a thorough musculoskeletal examination.

II. ANATOMIC CONSIDERATIONS

The medial femorotibial joint usually communicates with the femoropatellar joint but not with the lateral femorotibial joint. The communication between the femoropatellar and MFT joints can be variable and may be further reduced when pathology is present. Contained within the joint is the medial meniscus, medial femoral condyle, tibial plateau and intercondylar eminence, the cranial attachment of the cranial cruciate ligament on the tibia intercondylar eminence, and a portion of the caudal cruciate ligament. It is a large joint space with more soft tissue structures than most other joints in the horse.

III. CLINICAL SIGNS AND DIAGNOSIS

By far the most common clinical sign of problems within the MFT joint is effusion that is palpable on the medial aspect of the stifle just above the tibia. In horses with chronic OA, a thickening or buttress may be palpable on the proximal medial aspect of the tibia just below the MFT joint pouch. The MFT may be the site of lameness in horses without palpable MFT effusion but this is rare in the author’s experience. Lameness may or may not be present depending on the problem and how long the horse has been rested. In many young cutting horses, problems in the MFT may be a cause of performance problems, and not an overt lameness issue. However, most horses with MFT problems will present with a grade 2-4 lameness, have palpable MFT effusion, and be positive to both full limb and stifle flexion tests. Horses with chronic stifle problems may also have gluteal atrophy on the affected side.

The site of the lameness is often confirmed with intraarticular anesthesia of the MFT joint. Bone and joint abnormalities are often confirmed with radiography, while ultrasound is helpful to confirm a suspected meniscal problem. However, arthroscopy of the MFT is often needed to definitively diagnose articular cartilage damage on the medial femoral condyle, medial meniscal injuries, ligament injuries, and any combination of these problems. In general, multiple diagnostic techniques are necessary to completely evaluate the joint. When comparing arthroscopy and ultrasound, many lesions identified with ultrasonography may not be seen with the arthroscope, and cartilage defects observed with arthroscopy may not be visible with the ultrasound.

IV. INTRAARTICULAR APPROACHES TO MFT

There are two primary approaches for injection of the MFT joint. The first is located just medial to the medial patellar ligament approximately 1-2 cm proximal to the tibia. The needle is inserted perpendicular to the long axis of the limb in a slightly cranial direction. The medial meniscus may be contacted if the needle is directed too close to the tibia or too far lateral. A second approach on the medial aspect of the limb was developed to avoid the problem of contacting the medial meniscus. The site for needle insertion is 1.5 cm proximal to the tibial plateau in the depression between the medial patella ligament and the tendon of insertion of the sartorius muscle. The needle is directed in a cranial to caudal direction, parallel to both the ground and to a plane that bisects the limb. This approach has the advantages of consistent retrieval of joint fluid and avoids contacting the medial meniscus or medial femoral condyle.
V. SUBCHONDRAL CYSTIC LESIONS

SCLs are a common problem in horses. With the possible exception of spinal articular facets and the sacroiliac joints, they have been reported in every diarthrodial joint in the horse, with the medial femoral condyle (MFC) being the most common location. They are usually found on the weight-bearing surface of the joint, and may be clinical or non-clinical in nature. There are two proposed mechanisms for the development of SCL in the horse: osteochondrosis and trauma. Studies suggest that either may occur. The osteochondrosis theory is supported by evidence of collagen degradation found in explants from osteochondrosis lesions. The trauma theory is supported by studies where surgically created lesions to the cartilage and subchondral bone or cartilage alone can result in the formation of subchondral cystic lesions. Both described pathogeneses may be applicable to the clinical manifestation of disease.

Conservative or medical management of the SCL includes box stall rest with or without intraarticular medications, including hyaluronic, corticosteroids, and polysulfated glycosaminoglycans. This type of treatment is usually reserved for horses with minimal lameness, those with small lesions, and those without other treatment options for whatever reason. Historically, the basis of surgical management has been debridement of the cystic contents through an arthotomy and more recently via arthroscopy. This management has been augmented with a variety of supplemental surgical treatments with varying success, including cancellous bone grafts, mosaic arthroplasty, and recently, anecdotal reports of chondrocytes grafts and mesenchymal stem cells in fibrin glue. Results of arthroscopic debridement of 39 cases reported on by Howard et al.4 included a success rate of 56%, which equated to 72% when censored for horses originally classified as unsuccessful due to unrelated problems such as subsequent colic and OA in other areas. A major complication reported in that study was enlargement of the SCL subsequent to debridement.

A more recent surgical technique involves injecting the lining of SCLs with corticosteroids under arthroscopic guidance in order to reduce the production of local inflammatory mediators. These inflammatory mediators, which have been found in the cystic lining, recruit osteoclasts and cause further resorption of bone. Hypothesized advantages of this technique include a similar or increased chance of success as compared with debridement, shorter convalescence, lower risk of cystic enlargement, and minimal disruption of the articular surface. Results of arthroscopic injection of corticosteroids are similar to previous techniques with 67% of treated horses returning to soundness. However, unilateral cases were much more successful (81%) than bilateral cases (41%).2 This is currently the method used by the author for most horses with SCLs of the medial femoral condyle. With any treatment, the presence of radiographic evidence of OA is often a negative predictive sign.2,4

VI. TRAUMATIC SCLs

Horses with trauma induced SCLs of the medial femoral condyle are often older performance horses that present for lameness that is isolated to the MFT joint. They are often quite lame (grade 3-4/5) and have other concurrent injuries such as OA or medial meniscal lesions. Because of the multiple abnormalities, these horses have a poor prognosis for return to soundness. In addition, the author has seen a small number of horses develop SCLs of the medial femoral condyle subsequent to debridement of meniscal injuries. These SCLs were considered to be trauma-induced that were not evident on the initial radiographic evaluation of the stifle.

VII. MEDIAL MENISCAL INJURIES

Medial meniscal injuries have been reported to result from trauma to the equine medial femorotibial joint. Meniscal injuries are thought to account for 5-12% of all stifle lameness but are being recognized more frequently due to improved diagnostics such as ultrasound and arthroscopy. From the reported cases of meniscal lesions in horses, the medial meniscus in the right hind limb appears to be the most common site for injury. Meniscal lesions may occur as independent problems but are often associated with other abnormalities within the MFT joint. One study described that 61 of 80 horses with meniscal injuries had evidence of secondary cartilage damage.1 Concurrent soft tissue injuries including the cruciate and/or collateral ligaments, either alone or combined with meniscal injuries are also known to occur in the femorotibial joints of horses. The author has recognized medial meniscal injuries subsequent to SCL debridement and has identified concurrent medial meniscal and subchondral lesions of the medial femoral condyle in a small number of cases. These injuries are thought to be associated with trauma to the MFT joint in these horses but a potential cause and effect interaction between meniscal and SCL lesions has not been reported. Horses with less severe meniscal lesions (grades 1 and 2 or those visible in the cranial aspect of the MFT joint with arthroscopy) have a much better prognosis than those with meniscal lesions that are located beneath the medial femoral condyle. Treatment usually consists of surgical debridement/removal of the lesion with rongeurs or a motorized synovial resector. Supplemental treatment with disease modifying joint treatments is usually recommended.

VIII. ARTICULAR CARTILAGE FISSURING/CRAKKING/EROSSION

Articular cartilage defects should be suspected in horses with flattening and/or sclerosis of the medial femoral condyle seen on a caudal-cranial radiograph. These horses often have subtle lameness but usually have palpable effusion of the MFT joint. Partial thickness fissuring and cracking of the cartilage over the medial femoral condyle seems to occur in many young cutting horses and is thought to be associated with the twisting action of the stifle that is necessary for this type of work. It is hypothesized that this cartilage fissuring may eventually lead to full thickness erosions with continued exercise. Full
thickness cartilage erosions may also be associated with MFT joint trauma in any horse and is often seen in horses with radiographic evidence of OA in the MFT joint. Arthroscopic debridement of full thickness erosions is recommended together with subchondral bone micro picking. The prognosis for return to performance is usually poor in these horses. Supplemental treatment with a variety of disease modifying joint treatments may be recommended.

IX. OSTEOARTHRITIS

OA is often associated with previous trauma to the MFT joint, wear and tear from a prolonged performance career, or due to multiple abnormalities present within the MFT joint. MFT joint OA is usually an older horse disease but may occur in nearly any age depending on the cause. These horses often have moderate to severe effusion in the joint, a medial buttress on the tibial plateau, and are often grade 3-4/5 lame. Radiographic abnormalities suggestive of OA include osteophytes on the proximal-medial aspect of the tibial plateau, proximal intercondylar eminence, or axial aspect of the medial femoral condyle. Collapse or narrowing of the MFT joint space may be evident in some horses but this can be greatly affected by radiographic projection. Treatment of MFT joint OA is often palliative. Treating other abnormalities in the joint such as meniscal lesions, articular cartilage erosions, cruciate injury, medial femoral condyle SCL, etc should be considered to potentially slow the progression of the OA in the joint.

X. COMBINATION INJURIES

Combination soft tissue injuries occur in the equine stifle similar to other species. Injuries to the cranial cruciate ligament may have concurrent injuries to the medial or lateral meniscus and secondary articular cartilage damage. Horses with meniscal lesions often have concurrent articular disease on the ipsilateral femoral condyle. Debridement of SCLs has also been associated with subsequent development of medial meniscal lesions and SCLs on the medial femoral condyle have been seen to occur concurrently with medial meniscal lesions. Combination injuries within the MFT joint may contribute to failures with traditional treatment. Horses that do not appear to respond to treatment should be investigated for concurrent abnormalities that may be present within the joint.

SUGGESTED READING