Magnetic Resonance Imaging in the Purchase Examination: Seven Cases (2006–2008)

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Magnetic resonance (MR) imaging of the fore feet using a standing Hallmarq system is a safe, advanced imaging modality available for use as an adjunct diagnostic tool in the purchase examination. MR imaging may be best suited for the performance horse, because of the higher competitive demands and expectations placed on this type of horse. Findings from MR images allow the veterinarian to more accurately advise buyers of potential performance limiting conditions of the foot. Authors’ addresses: University of California-Davis, Veterinary Medical Teaching Hospital, Davis, California 95616 (Kelleher); San Dieguito Equine Group, San Marcos, California 92069 (Charles, McClellan); and Equine Diagnostic Imaging, Vista, California 92084 (Werpy); e-mail: maurkell@gmail.com (Kelleher). © 2009 AAEP.

1. Introduction

Equine veterinarians routinely perform a purchase examination to advise a buyer of health or soundness conditions that may adversely affect the horse’s intended use. Typical components of a purchase examination in the performance horse are static and dynamic orthopedic examination, evaluation under saddle, and neurologic and ophthalmic assessment. Common ancillary tests performed are complete blood count, biochemical analysis, and toxicological screening for the presence of tranquilizers or non-steroidal anti-inflammatory medication, and diagnostic imaging surveys. In recent years, advanced imaging modalities, such as nuclear scintigraphy, magnetic resonance (MR) imaging, and computed tomography (CT), have become accessible to the equine veterinarian as a diagnostic aid in orthopedic evaluations. Because use of these modalities is applied more frequently for the diagnosis of performance limiting problems in horses, their use will undoubtedly increase for purchase examinations.

In recent years, advanced imaging modalities, such as nuclear scintigraphy, magnetic resonance (MR) imaging, and computed tomography (CT), have become accessible to the equine veterinarian as a diagnostic aid in orthopedic evaluations. Because use of these modalities is applied more frequently for the diagnosis of performance limiting problems in horses, their use will undoubtedly increase for purchase examinations. Nuclear scintigraphy highlights areas of increased radiopharmaceutical uptake (IRU). IRU indicates areas of active bone turnover, making nuclear scintigraphy a sensitive, but not specific, imaging modality. Used in conjunction with clinical examination and diagnostic anesthesia, nuclear scintigraphy shows areas of concern that can guide the veterinarian toward choosing a more sensitive imaging modality, if indicated. MR imaging provides detailed information about bone and soft tissue structures in a specific area. Similarly, CT allows assessment of bone and to a lesser degree soft tissue.
structures in a specific area of interest. This report summarizes MR study findings in horses presented for purchase examination and quantifies imaging modalities performed in conjunction with purchase examination.

2. Materials and Methods

Medical records from January 1, 2006 through December 31, 2008 were reviewed to identify horses having undergone purchase examination by one of five veterinarians employed by San Dieguito Equine Group during the specific date range. Information collected for this study included whether digital radiography, ultrasonography, endoscopy, nuclear scintigraphy, or MR imaging were performed. For horses that had ultrasonographic examination, the location of structures imaged was recorded. For horses that had MR imaging performed, degree of lameness if present, details of MR imaging findings, and follow-up information, such as current level of work or period of lameness after purchase examination, were recorded.

3. Results

From January 2006 through December 2008, 352 purchase examinations were performed, which was an average of 117 each year. One hundred twenty-eight purchase examinations were performed in 2006, 106 in 2007, and 118 in 2008. Seventy-two percent (255) of horses examined had digital radiography performed, ranging from a single joint or structure in one limb to an extensive series of images on multiple structures. This figure is higher than the 61.1% previously reported by van Hoogmoed et al. and 49% by Dart et al. Five percent (19) of horses in our study did not have radiography performed at the time of the purchase examination. In these 19 cases, the veterinarian performing the examination reviewed recent radiographs taken by another veterinarian.

Ultrasound examinations were performed in 52 horses (14%). The suspensory ligament (30) was the most commonly imaged structure (Table 1). Other structures evaluated with ultrasound included superficial digital flexor tendon (12), stifle (4), accessory ligament of the deep digital flexor tendon (3), pastern region (1), pelvis (1), and heart (1).

These figures differed significantly from Dart et al., in which ultrasound was used in 1% of purchase examinations.

Upper airway endoscopy was performed in 12 horses (3%), and gastroscopy was performed in 1 horse (0.3%). The figures for upper airway endoscopy were much lower than reported by Dart et al. (15%).

Nuclear scintigraphy was performed in two horses (0.6%). Nuclear scintigraphy performed in conjunction with purchase examination has not been previously reported.

During this time period, seven horses (2%) had standing, low-field MR imaging performed as part of the purchase examination. Two MRI examinations were performed in 2006 and 2008, and three were performed in 2007. The MR imaging protocol included T1-weighted gradient echo (T1 GRE), T2*-weighted gradient echo (T2* GRE), proton density (PD), T2-weighted fast spin echo (T2 FSE), and short tau inversion (STIR) recovery sequences. All studies included images in the sagittal, frontal, and transverse planes using a 0.27-T magnet. All MR imaging studies were evaluated by a diplomate of the American College of Veterinary Radiology.

In all cases in which MR imaging was performed, findings and risk assessment were provided to the buyer. In two cases, the horses were sound and had no other clinical abnormalities at time of examination, and the horses were purchased. In one case, the horse was sound, but after discussion of clinical and MR findings with the veterinarian, the buyer determined the horse would not be suitable for its intended use and chose not to purchase it. In three cases, the horses were unsound at time of examination. In these cases, after discussion of clinical finding, MR findings, and risk assessment with the veterinarian, the buyers purchased these horses based on the opinion that they were suitable for their intended use. In one case, the horse was unsound and after discussion of clinical findings, MR findings, and risk assessment with the veterinarian, the buyer judged the horse unsuitable for its intended use.

In each of the following cases, MR imaging was performed in conjunction with the purchase examination, which included clinical, neurologic, ophthalmic, and orthopedic examination. The dynamic orthopedic examination included evaluation of the horse at the walk and trot in a straight line on hard ground. Evaluation of all gaits in a circle to the left and right on hard and soft ground was performed as well as evaluation under saddle on soft ground. Flexions of front and hind distal limbs, carpi, hocks, and stifles were performed. Evaluation of lameness was based on the AAEP lameness scale. The standard radiographic study included four views of each front foot, four views of each front fetlock, two views of each hind fetlock, four views of each hock, and two views of each stifle. Deviation from the

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standard examination protocol and radiographic survey is noted by case.

Case 1
A 6-yr-old Holsteiner stallion presented for purchase examination in July 2006. The horse was competing at the 1.15-m level. The buyer intended to use the horse as a Grand Prix jumper. Clinical examination of the horse showed poor foot conformation because of a negative palmar angle of the foot. A positive response to hoof tester application was present in both front feet. The horse was overdue for shoeing and poorly shod at the time of examination. The horse was graded 1 of 5 left front lame in a circle to the left and right. The horse had a positive response to flexion of both front distal limbs, but all other flexion tests were within normal limits. The abnormal foot–pastern axis was present on radiographs of the front feet. No other abnormalities were identified radiographically. Because of the owner’s interest in the horse for Grand Prix level work, the presence of lameness at time of examination, and poor foot conformation, MR imaging was suggested before purchasing and increasing work level.

Distal border fragmentation of the right front navicular bone was present. Other MR imaging findings included mild synovitis of the left front distal interphalangeal (DIP) joint; slight increased signal intensity on STIR images in both front navicular bones indicative of edema, contusion, or osteonecrosis; mild bursitis of both front navicular bursae; and slight synovitis of the right front DIP joint. Distal border fragmentation of the navicular bone has been reported to be a cause of lameness as well as an incidental finding. Distal border fragmentation associated with sclerosis or fluid in the navicular bone, abnormality of the dorsal margin of the deep digital flexor tendon (DDFT), and evidence of adhesions in the navicular bursa have been associated with lameness. In this case, the lack of additional findings associated with the distal border fragment of the navicular bone led the veterinarian to conclude that the presence of the fragment carried low risk.

The horse was purchased. Improved and more regular shoeing was instituted. Exercise was reduced to flat work in the first 3 mo after purchase to allow time for shoeing changes to have an effect on the horse’s soundness.

Currently, the horse is successfully competing at the Grand Prix level. The horse has had one recurrence of bilateral foot pain since purchase. Treatment of both front DIP joints with corticosteroid and hyaluronic acid resolved the front foot lameness.

Case 2
A 6-yr-old Warmblood gelding presented for purchase examination in November 2006. At the time of purchase examination, the horse was competing as a hunter. The buyer intended to remain at a similar level of competition. On clinical examination, exostoses of the right and left metacarpus II (MCII) were identified, with no pain response to palpation. Mild effusion of the right medial femorotibial joint was present, as was a painful response to palpation of the right metatarsal IV (MTIV). The horse was appropriately shod; however, the right front foot had a slightly higher heel than the left. The horse was not positive to hoof tester application. The horse exhibited a 1.5 of 5 right front lameness in a circle to the right and left, as well as under the saddle. The horse was not positive to joint flexion. Palmar-digital peri-neural anesthesia abolished right front lameness. Radiographic abnormalities included a minor enthesophyte on the left front medial proximal sesamoid bone and two small, smooth osteochondral fragments in the dorsal aspect of the left hind fetlock. All findings were unchanged from previous radiographs provided by the seller. Ultrasoundographic examination of both front and both hind suspensory ligaments showed no abnormalities. Advanced imaging was recommended because of the horse’s relatively young age, current lameness, and lack of abnormalities on foot radiography.

The soft tissue phase of nuclear scintigraphy showed diffuse IRU in the right front distal limb and the medial aspect of the left front foot. Multiple areas of IRU were identified on bone phase. IRU related to the feet included mild to moderate right front distal phalanx; right and left front distal phalanges at the lateral aspect of deep digital flexor tendon (DDFT) insertion; and mild to moderate right and left navicular bones. MR imaging was recommended to confirm the significance of the IRU in the feet.

MR imaging findings included mild bursitis of both front navicular bursae and mild increased signal intensity on STIR images indicative of edema, contusion, or osteonecrosis in the left front navicular bone.

Increased bone turnover resulting in IRU on nuclear scintigraphy is not necessarily indicative of pathologic change, such as the presence of sclerosis or fluid; therefore, an MR imaging examination was necessary to determine the significance of scintigraphic findings.

The results of the MR imaging showed minor abnormalities that would not preclude the horse from continuing at the same level of work with the buyer. After discussion of these abnormalities with the veterinarian, the buyer deemed the findings a manageable risk and purchased the horse. The right front DIP joint was treated with hyaluronic acid and corticosteroids. Shoewing changes were recommended. After 1 mo of decreased exercise, the horse was gradually returned to his previous level of activity. The horse has had no recurrence of front foot lameness since purchase.
Case 3

A 9-yr-old Czechoslovakian Warmblood gelding presented for purchase examination in June 2007. The horse was imported from Europe ~2 mo before the purchase examination and had competed in several Grand Prix jumping events since his arrival. The buyer intended to continue to jump the horse at the Grand Prix level. Clinical examination showed a deep hoof ring appeared to have grown out from the coronary band as the result of a systemic insult that occurred ~2 mo previously. The horse was not positive to hoof tester application, showed no evidence of lameness, and had a mild positive response to flexion of both front distal limbs. Remaining flexion tests were within normal limits. A smooth fragment was identified at the proximal axial surface of the left hind lateral proximal sesamoid bone on radiographs. The veterinarian and buyer discussed the benefits of using MR imaging to gain more information. The buyer had recently purchased a different Grand Prix jumper that was sound at the time of purchase examination and subsequently became lame. In that case, MR imaging showed injury to the DDFT at the level of the navicular bone. Therefore, the buyer opted to have MR imaging performed before purchase even though the current horse was not showing any signs of lameness.

MR study findings included low signal intensity on T1 GRE images with corresponding moderate increased signal intensity on STIR images in the dorsal distal aspect in the trabecular bone of the right front middle phalanx indicative of edema, contusion, or osteonecrosis (Fig. 1). Additional findings included mild to moderate degenerative injury with a small area of fiber disruption in the right front medial collateral ligament of the DIP joint; moderate synovitis of the right front DIP joint; mild synovitis of the left front DIP joint; focal mild to moderate increased signal intensity on STIR images in the right front distal phalanx indicative of moderate stress related edema, contusion, or osteonecrosis at the insertion of the impar ligament; mild navicular bursitis of both front navicular bursae; and mild increased signal intensity on STIR images in the left front middle phalanx indicative of edema, contusion, or osteonecrosis.

Based on the limited research available at the time of the purchase examination regarding the increased signal intensity located in the trabecular bone of the middle phalanx on STIR images, the buyer was advised of the potential risk of lameness from the fluid signal as well as other abnormalities identified on MR imaging. The buyer opted not to purchase the horse. The seller continued to train and show the horse. Three months after the initial MR imaging examination, a follow-up examination was performed at a different facility using the same type of MR system. The second MRI examination showed partial resolution of the fluid signal located at the dorsal distal aspect of the right front middle phalanx. At last report, the horse was competing as an upper level jumper with no lameness in the fore limbs.

Case 4

A 12-yr-old Dutch Warmblood gelding presented for purchase examination in July 2007. The horse was...
competing in Grand Prix dressage. The buyer intended to continue using the horse at the same level of competition. Clinical examination was unremarkable. The horse had no response to hoof tester application. The feet were judged to be symmetrical and appropriately shod. The horse was not lame. The horse had a positive response to flexion of both hocks, but all other flexions were within normal limits. Radiographic abnormalities included a smooth osteochondral fragment identified at the dorsal aspect of the left front DIP joint. No other abnormalities were noted on radiographs. Ultrasonographic examination was performed on both front and both hind suspensory ligaments. No abnormalities were identified. The buyer was making a considerable investment in the horse and therefore MR imaging of both front feet was performed.

MR imaging findings included focal sclerosis of the palmar distal lateral aspect of the right front distal phalanx, likely the result of previous trauma or concussion; mild to moderate degenerative injury to the right front lateral collateral ligament of the DIP joint at the level of the middle phalanx; slight increased signal intensity on STIR images in both front navicular bones indicative of slight edema, contusion, or osteonecrosis; fragmentation of the extensor process of the left fore distal phalanx; a small dorsal margin tear and focal dorsal margin fraying of the left front DDFT indicative of mild injury to the tendon; and mild focal degenerative injury to the left fore medial collateral ligament of the DIP joint.

The MR imaging findings, when considered in conjunction with the clinical examination, were consistent with mild pathologic change for the age of the horse and compatible with continued use as a Grand Prix dressage horse. The consulting radiologist and purchase veterinarian advised the buyer that these findings carried relatively low risk. The buyer purchased the horse. The horse has been working at the Grand Prix level consistently and has had no occurrence of lameness.

Case 5

A 10-yr-old Warmblood gelding presented for purchase examination in November 2007. The horse was competing in the second-year green hunter division. The buyer intended to show in the adult hunter division. Clinical examination of the horse showed slight reactivity to palpation of the left MCII and reduced sacral reflexes. The horse did not respond to application of hoof testers. Neurological examination showed that the horse was reluctant to cross over the hind limbs when circling in either direction and had a shorter stride on left hind when walking downhill. The horse was judged 1 of 5 lame in the left front in a circle to the left. In a circle right, the horse was 1 of 5 lame in both the left front and right hind. The horse responded positively to flexion of both front distal limbs and both tarsi. Additional radiographic studies in this case included the left metacarpus. Mild peri-articular remodeling of the tarsometatarsal joint and a smooth exostosis of the left MCII were the only radiographic abnormalities. Advanced imaging was recommended because of multiple areas of concern on the clinical examination and evidence of lameness.

Multiple areas of IRU were identified on nuclear scintigraphy, including the right sacroiliac region. IRU related to the feet included mild, diffuse uptake in the right and left front navicular bones.

The MR study showed moderately enlarged synovial invaginations with trabecular bone loss in the distal aspect of the left front navicular bone. Additional findings included mild increased signal intensity on STIR images in the right and left front navicular bones indicative of edema, contusion, or osteonecrosis; mild focal degenerative injury of the left front lateral collateral ligament of the DIP joint; mild focal degenerative injury of the left front DDFT; and mild synovitis of both front DIP joints.

Based on IRU in the sacroiliac region, a pelvic ultrasound was performed. A focal decrease in echogenicity was identified at the cranial aspect of the lumbosacral intervertebral disc. This finding is consistent with disc degeneration or fluid within the disc.

Although multiple areas of concern were identified, the buyer deemed the horse suitable for its intended use. The horse’s temperament was a unique fit for the style of riding required of the buyer. The buyer was counseled regarding future management of the orthopedic issues identified, including navicular bone abnormalities and related foot pain, as well as lumbosacral pain. Recommendations included administration of intravenous tiludronate bisphosphonate as well as shoeing changes that included adding pads to the front shoes.

The horse was sound for ~9 mo after purchase, when a left front lameness was identified. During orthopedic examination, left front DIP anesthesia was performed to determine whether the source of lameness was from the DIP joint. The left front lameness was abolished by intra-articular anesthesia of the DIP joint at 10 min. Palmar-digital peri-neural anesthesia could have been performed on a subsequent day to offer additional localization information; however, given the horse’s previous response to peri-neural anesthesia and the current response to DIP anesthesia, it was determined that the previous MR findings were likely the source of the horse’s current lameness. It is our experience that many lesions in the navicular bone region will be anesthetized at 10 min with intra-articular DIP anesthesia.

Shoeing changes and administration of IV tiludronate bisphosphonate had not resolved the lameness when the horse was re-evaluated 1 mo after administration. A follow-up MR imaging examination was performed. New findings included moder-
ate bursitis of the left front navicular bursa and mild synovitis of the right front DIP joint. The mild increased signal intensity on STIR images in the right and left navicular bones persisted. Additionally, the enlarged synovial invaginations noted on the initial MR images were more prominent with cystic fluid accumulation and additional trabecular bone loss.

The left front navicular bursa was treated with corticosteroids and hyaluronic acid. Blood was collected and processed for interleukin-1 receptor antagonist protein (IRAP) therapy. The left front DIP joint was treated with IRAP 2 wk after treatment of the navicular bursa, with an additional treatment 2 wk after the first IRAP treatment. The horse returned to his previous level of work. Although this horse requires continued management, he is able to perform to the level intended by the owner.

Case 6

A 9-yr-old Holsteiner gelding presented for purchase examination in February 2008. At the time of purchase examination, the horse was beginning to train at the Grand Prix jumper level. The buyer intended to use the horse as a Grand Prix jumper. Clinical examination of the horse showed reactivity to palpation of the right MCIV. The horse was shod in an open steel shoe with a frog support pad on the left front foot and an open steel shoe with a flat leather pad on the right front foot. The horse had a mild positive response to hoof tester application on both front feet. The horse exhibited a 1.5 of 5 left front lameness in a circle to the left and right. The horse was positive to both front distal limb flexion tests; however, the response to flexion of the left was worse than the right. The horse was also mildly positive to flexion of both hocks and both stifles. Palmar-digital peri-neural anesthesia abolished the left front lameness. Additional radiography performed in this case included views of the right metacarpus. Radiographic abnormalities included peri-articular remodeling of the left tarso-metatarsal joint, mild peri-articular remodeling of both front fetlock joints, and exostosis of the right MCIV. Cystic and irregular distal borders and sclerosis of the medullary cavity of the navicular bones were identified on radiographs of both front feet (Fig. 2). The degree of radiographic change in the left front navicular bone was more significant than the right. Ultrasonographic evaluation of both front suspensory ligaments was unremarkable. MR imaging was recommended before purchase because of the presence of a lameness that was responsive to palmar-digital peri-neural anesthesia and radiographic evidence of navicular bone abnormalities.

MR study findings included mildly to moderately enlarged synovial invaginations in the distal aspect of the navicular bone (Fig. 3); mild to moderate synovitis of both front DIP joints; mild to moderate increased signal intensity on STIR images in both front navicular bones indicative of edema, contusion, or osteonecrosis (Fig. 4); mild to moderate bursitis of both front navicular bursae; and mild increased signal intensity on STIR images in both front distal phalanges indicative of stress related

Fig. 2. Sixty-five-degree dorsoproximal-palmarodistal oblique view of the left front depicting irregularity of the distal border of the navicular bone, indicating bone loss. Areas of lucency can be identified in the distal aspect of the navicular bone, consistent with enlarged synovial invaginations. These findings were the primary concern leading to recommendation for MR imaging.

Fig. 3. Case 6. MRI images corresponding to radiography in Fig. 2. Frontal T1-weighted gradient echo image of the left front foot depicting mild to moderately enlarged synovial invaginations.
edema, contusion, or osteonecrosis at the insertion of the impar ligament.

The horse was unsound at time of examination and had radiographic evidence of pathologic change in the navicular bones that was confirmed and detailed further by MR imaging. The horse was young and yet to be used consistently for the buyer’s intended use. The buyer opted not to purchase the horse.

Case 7

A 12-yr-old Hanoverian gelding presented for purchase examination in August 2008. The horse was competing at the 1.4-m level. The buyer was interested in jumping at the same level. The horse had a non-reactive exostosis palpable on the left MCII. The horse was moderately sensitive to palpation of thoracic spine 18. No other abnormalities were noted on clinical examination. The horse had appropriate hoof symmetry and was properly shod. The horse did not respond to hoof tester application. The horse was sound at all gaits and under saddle. Mild positive responses were seen to flexion of the right tarsus and right stifle. All other joint flexions were within normal limits. Additional radiography performed in this case included views of the cervical spine and dorsal spinous processes. A small, smooth osteochondral fragment was identified at the dorsal aspect of the right front fetlock, and mild peri-articular remodeling was noted at the dorsal aspect of the right front proximal interphalangeal joint. Ultrasonographic evaluation of all four suspensory ligaments was within normal limits.

Nuclear scintigraphy showed no significant areas of IRU. MR images showed a focal dorsal margin defect in the medial lobe of the DDFT distal to the navicular bone, indicative of a mild injury to the tendon.

The horse was purchased and has not shown any evidence of lameness since purchase. The horse is competing successfully at its intended level.

4. Discussion

Use of advanced imaging during a purchase examination allows the veterinarian to communicate more detailed information regarding potential risks to a buyer. The distal limb, specifically the feet, are often implicated as a source of lameness in the performance horse. MR imaging of the front feet can be used to assess the navicular bone and related soft tissue structures to identify pathologic changes not seen on radiographs. In addition, the DDFT and collateral ligaments of the DIP joint can be assessed, both of which are difficult to fully evaluate with any other imaging modality.

Identification of lameness by the veterinarian during a purchase examination is often a reason for a buyer to determine that a horse is not suitable for its intended use. Cases 1 and 2 showed presence of lameness at time of purchase examination may not be the only criterion the buyer uses when determining whether to purchase a horse. In these two cases, MR imaging identified the likely cause of lameness and allowed the veterinarian to discuss potential risks of future or continued lameness. In both cases, the buyer purchased the horse because it was determined to be suitable for its intended use. Each of these horses is performing to the expectations of the buyer and requires minimal management of the abnormalities identified on MR images. Cases 4 and 7 showed that MR imaging performed in the sound horse gives the buyer greater confidence in their decision because no significant abnormalities within the hoof capsule were present at time of purchase. For some buyers, a previous negative outcome from a purchase examination has prompted the request for additional advanced imaging.

MR imaging is relatively new to equine veterinary medicine. Determining which abnormalities are associated with lameness is not always clear. When a lesion is identified in a sound horse presented for purchase examination, it may be difficult to determine the significance of the lesion and educate the owner regarding risk, especially if the lesion is typically associated with lameness, as was seen in case 3. Increased signal intensity on STIR images indicative of fluid located in the distal middle phalanx can be associated with lameness. A recent study by Olive et al reported that five of seven horses with fluid signal in the distal aspect of the middle phalanx identified on MR images were lame.
The investigators concluded that pathologic change associated with the fluid signal was the source of the lameness. One of the two sound horses in the report of Olive et al. is the horse reported here. Relative to human medicine, knowledge of the significance of increased signal intensity on STIR images within the bone is limited. Fluid signal has been a reported MR imaging finding in horses with unsoundness. Fluid signal within the bone has also been identified as a possible source of pain in dogs and human patients. In case 3, follow-up MR images showed partial resolution of the increased signal intensity on STIR images. The horse reportedly did not show any signs of lameness with continued work in the period between the two MRI examinations. In humans, fluid signal development caused by altered biomechanical forces has been identified in the asymptomatic athlete. Olive et al. suggests that fluid signal in the middle phalanx of sound horses could be caused by this reason. However, increased signal intensity on STIR images in bone in the clinically sound horse has also progressed to severe, debilitating lameness. Identification of a significant degree of fluid signal in the phalanges of a sound horse presented for purchase examination warrants advising of the possibility of future lameness. The buyer may ask the seller to allow a waiting period before the buyer makes final decisions about purchase. If the horse remains sound and fluid signal resolves on subsequent MR imaging, the buyer can have more confidence deeming the horse suitable for its intended use.

Case 5 showed that enlarged synovial invaginations of the navicular bone can be progressive in nature. In case 5, as well as others in the authors’ care, indicate that enlargement of the synovial invaginations with subsequent bone loss, could lead to clinical signs that are often difficult to manage. Enlarged synovial invaginations with concurrent findings present such as extension through the distal aspect of the flexor surface of the navicular bone, abnormality of the navicular bursa or DDFT at the level of the navicular bone, or enlargement and extensive trabecular bone loss carry more guarded prognosis than those found without concurrent change. In case 5, the progression of the appearance of the synovial invaginations make this MR finding significant. If cystic or enlarged synovial invaginations are identified in the navicular bone on MR images acquired at purchase examination, different conclusions regarding the horse may be made, depending on the appearance of the navicular bone and concurrent abnormalities.

Disadvantages of advanced imaging in conjunction with purchase examination include expense to the buyer and risk of injury or death to the seller’s horse associated with the diagnostic procedures. The cost of advanced imaging may be prohibitive, especially in cases where information gathered on one study leads to further imaging. For example, nuclear scintigraphy findings often lead to additional radiographic studies or MR imaging. Although advanced imaging may be expensive, the value of the information obtained could outweigh the cost for many buyers. Many MR imaging findings do not cause future lameness. However, several findings, such as small navicular bone flexor cortex erosions, significant DDFT, and collateral ligament of the DIP joint injury and abnormal fluid in bone, are lesions not identifiable on radiographs and carry higher risks of lameness. Additionally, horses that are sound at the time of purchase examination have developed an acute lameness attributable to a lesion with evidence of chronicity. Therefore, without the benefit of advanced imaging, the buyer assumes greater risk of lameness and potential loss of their investment.

CT and some MRI systems require general anesthesia of the horse to acquire images that could be more risk than the seller is willing to assume for a purchase examination. Nuclear scintigraphy and MR imaging can be accomplished using standing sedation protocols so a seller may be more inclined to allow these types of modalities to be used in the purchase examination.

MR imaging in conjunction with the purchase examination is a valuable tool. It improves the veterinarian’s ability to recognize problems and make conclusions about specific abnormalities. Based on the types of lesions typically seen in lame horses presented for imaging, the veterinarian can advise a buyer of the relative risks carried by such lesions seen in horses presented for purchase examination. As MR imaging becomes more frequent in equine orthopedics for the characterization of lesions found in lame horses, this imaging modality will be invaluable in the purchase examination, especially in the sale of performance horses.

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