Diagnosis of Soft Tissue Injury in the Sport Horse

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KEYWORDS

• Soft tissue injury • Horse • Ultrasound • MRI

KEY POINTS

- Soft tissue injuries are common in sport horses and due to the long lay-up period, it is important to have an accurate diagnosis.
- Ultrasonographic evaluation is mainly used in horses to evaluate soft tissue injuries, and special techniques can help further characterize the severity and duration of injury.
- MRI has recently become more available for diagnosis of soft tissue injury, and it is important for the equine practitioner to understand basic principles as well as in what situations MRI can provide additional valuable information.
- Contrast computed tomography may give additional information about soft tissue injuries in the equine foot and distal limb in case MRI is not available.
- MRI and computed tomography can add additional information to ultrasonography, given the ability to evaluate the internal bone structure and structures within the hoof capsule.

INTRODUCTION

Soft tissue injuries are a common cause of lameness in the sport horse. Because the recovery time from soft tissue injuries is in most cases more than 6 to 12 months, and in most cases results in a certain loss of muscle mass and conditioning, it is important that the diagnosis is accurate. The clinical examination, results of diagnostic analgesia, and diagnostic imaging must be correlated to determine the clinical significance of each lesion. With portable ultrasound machines becoming more powerful and more affordable, a wide range of examinations can be done in the field. Depending on the lesion, MRI can be used as a second imaging modality, as it has inherently high contrast resolution allowing for detection of lesions within soft tissue structures, as

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well as differentiation of adjacent soft tissue structures from one another, and the cross-sectional nature of MRI is unaffected by surrounding structures. As such, it is particularly useful for imaging the soft tissues within the hoof capsule that cannot be evaluated with ultrasound and the area of the proximal suspensory where smaller lesions can be missed on ultrasonographic examination.

CLINICAL EXAMINATION AND DIAGNOSTIC ANALGESIA

During clinical evaluation, certain information can give the clinician hints of soft tissue injury.

1. *History*: Lameness is reported to improve with rest, but worsens again with exercise. In some instances (superficial digital flexor tendon [SDFT] lesion, suspensory branch injury, or inferior check ligament injury), lameness can resolve quickly, but the underlying soft tissue injury may get worse with continued exercise.
2. *Visual examination*: Soft tissue injury may be characterized by visual swelling or asymmetry between corresponding limbs.
3. *Palpation*: Soft tissue swelling might be felt in acute cases of soft tissue injury and if the injured structure is superficial enough. Focal pain to palpation and increased heat can be noted as signs of inflammation, but their absence will not exclude soft tissue injury. Injury of the distal sesamoidean ligaments, impar ligament, proximal suspensory ligament, or collateral ligaments may not be identified with palpation.
4. *Examination during motion*: Lameness caused by soft tissue injury is often more pronounced when the horse is worked on soft ground versus on harder ground. Flexion tests on the contralateral limb might increase the lameness on the affected limb due to increased weight bearing and can be seen in horses with deep digital flexor tendon (DDFT) lesions.[1] Lower and upper limb flexion tests may both be positive if the soft tissue structure spans over a longer area, for example, suspensory ligament. In the hind limb, upper or lower limb flexion test can be falsely positive due the reciprocal apparatus.
5. *Diagnostic analgesia*: To confirm the location of injury, diagnostic analgesia is an important step during the examination process. Ligamentous injury in close proximity to the joint (eg, collateral ligaments, impar ligament, distal aspect of suspensory branches) will be desensitized by intra-articular diagnostic analgesia. This should be taken in consideration when radiographs are within normal limits. In some cases, it is beneficial to perform diagnostic analgesia after ultrasonographic evaluation to avoid air shadow (reverberation) artifacts (eg, proximal suspensory ligament). In horses with multiple injuries to soft tissue and/or bone, diagnostic analgesia also can be used to further weigh the significance of diagnostic imaging findings.

ULTRASONOGRAPHIC EXAMINATION

Ultrasonographic examination is a very effective method to diagnose soft tissue injuries in the equine patient. Although MRI is considered the gold standard for the diagnosis of soft tissue lesions, the ultrasonographic examination can provide important information of most anatomic regions where ultrasound can penetrate the tissues and in regions not amendable to MRI because of the size limitations. In addition, radiographic evaluation and nuclear scintigraphy are useful to evaluation bony involvement at the origin and insertion of soft tissue.