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Clinical Exam of the Lame Horse: Life Without MRI

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Take Home Message—The equine practitioner must undergo a specific type of examination to evaluate a horse’s musculoskeletal system, including observation and palpation when the horse is at rest or in motion. This type of exam can be done as the horse exercises in his field of work or competition. In a world where we have more technology available (such as MRI) for our medical imaging, practitioners need to be more accurate in their clinical skills. This paper will discuss different tests to see what they can offer to the practitioner in order to get as deep as possible into a diagnosis before picking up an imaging technology.

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I. INTRODUCTION

The equine practitioner has become more specialized in their work as clients ask for more detailed examinations, with lameness exam being the most requested. The practitioner should have a good knowledge of major sources of discomfort, as well as anatomy, joint and tendon biomechanics. An understanding of foot lameness and farriery is important as these are the most common problems in the lame horse. Horses are examined at rest and in motion, evaluated conventionally in hand or under tack, during harder exercise or when they are competing.

II. PRINCIPLES OF THE ORTHOPAEDIC EXAM

Horse should be evaluated with a series of observations and tests in order to identify a source of gait abnormality or lameness.

Exams at Rest

Auscultation

Since orthopaedics is normally a part of a full clinical exam, the author recommends auscultation of the heart and lungs. The main purpose is to avoid missing a serious disorder that may not allow a sport horse to achieve its goal. For example, if the horse has atrial fibrillation, then orthopaedic issues might become of less interest.

Observation

This exam is done in a quiet place with the horse placed in a stall or on a cross tie and allows the practitioner to go around and observe the horse visually before palpation is started.

The veterinarian should observe the behaviour and vigilance of the horse and the way the horse stands. For example, is the horse non-weight-bearing a hind limb with potential lumbar pain, or putting one fore limb forward or in light adduction to release heel pain or medial heel pain. The overall conformation should be observed for abnormal amyotrophy as well as any asymmetry of limbs or asymmetry of the muscling of neck and top line. The horse should also be observed for asymmetric weight bearing, shoeing and front feet abnormalities such as toe in or out, or feet asymmetry giving history of abnormal overload on wider foot. Hind limbs and front limbs should be observed for major deformities such as conformation such as a long pastern and low fetlock position enhances suspensory strain.

Palpation

A tip of the nose to tip of the tail evaluation is made including teeth, jaws, base of the skull, neck withers, back and hind quarters. There is a need to evaluate each main joint from top to bottom with mostly the thumb and index finger to evaluate each synovial recess. On sport horses, time is spent on stifles, hocks, front and hind fetlocks and front coffin joints. Soft tissues, including muscles, tendons (especially flexor palmar and plantar), and collateral ligaments can be easily assessed looking for heat, deformity or pain to pressure.
Passive Tests

A series of slow motion tests can be done on the body of the horse and include the following:

- Passive flexion tests of the joints (fetlocks and coffin joints, or hocks and stifles)
- Passive protraction and retraction of the proximal joints of the limbs
- Passive tests of the neck and the back assessing latero-motion and extension/flexion

For these three types of tests, the key is the range of motion (ROM) and potential pain at the end of flexion or extension. For example, a fetlock joint flexion may show pain as the flexion is at its higher range of flexion with a dorsal capsulitis.

- Hoof tests of both front feet (or hinds if necessary)

Hoof testing is not always documented but can allow the practitioner to target an area of pain on the sole or wall of the foot. There are different receptors in the foot which can indicate potential deep or superficial pain in relation to the pressure and time of pressure on the affected hoof. The board extension test on the front feet elevates the toe and creates a strain in the palmar part of the foot. This test is positive when the horse tries to jump from the board or extend the whole body backwards. If it is positive, pain is indicated in the deep flexor tendon and insertions, the navicular bone, the palmar coffin joint and capsule, and sometimes the collateral ligaments. These abnormal findings are reported on a grid or on a paper in order to coordinate any further assessment.

An entire chapter in this presentation could be devoted to neck and back pain. It’s amazing to see how many horses change and adapt their axial skeleton towards even minor distal limb issues. This explains part of the success of chiropractors or osteopaths, whose evaluation of the top line has been more thorough and detailed, thus picking up abnormal tension as a consequence of a distal limb problem.

The exam of the back and neck are done with one hand on each side to palpate and feel any muscle tension, heat or abnormal spasm. This is repeated after the horse is worked because it is of interest to re-evaluate these structures once the horse has been warmed up. Some may disappear, signifying a more superficial issue. Some of them will be consistent or worse after exercise, and might be related to more significant problems involving deeper structures, either bone, muscles, ligaments or joints.
A specific exam of the back should also include a rectal examination so the practitioner can palpate the contour of the pelvic bones, the psoas muscles bodies and caudal insertions, as well as inguinal rings on stallions and ovaries on mares, which could indicate a source of lumbar pain.

At the end of the static exam, the practitioner should have a fair idea of what type of lameness or discomfort they might be dealing with. It is interesting at this stage to make a list of potential issues and take into account the history given by the trainer or rider. The acuteness or chronicity of lesions should be distinguished at this stage. Also because starting to jog the horse can be contraindicated in a few scenarios such as acute lameness with heat, distended joints or a swollen leg.

Combining all these tests can help differentiate different pathologies (see example in following schema). The practitioner has to add different types of parameters of his findings and determine a step by step diagnosis.

For example, a horse with just a coffin joint flare, and no other significant positive test, could have just a synovitis. The same horse with a positive board extension test and potential pain on the passive flexion test could have inflammation pain of the dorsal capsule of the coffin joint. In this case, the dorsal joint capsule is thickened and the passive test shows a restriction of ROM and pain.

**Exam in Motion**

More credit is given to the way the horse is moving at the beginning of the exam because some sources of pain may rapidly change with warming up. This mainly occurs when hard tissue structures such as bone and joints are involved.

**Exam at the Walk**

The horse is examined on a firm, safe, footing -- not slippery. The horse should walk in a straight line, and then in a figure eight. This allows the practitioner to evaluate hind quarters symmetry in motion (hip and pelvic motion) and front feet landing (flat or not) at the walk and how each fetlock drops (should load and drop equally).

**Exam at the Trot**

The horse is jogged on a straight line and on circles going in both directions. It is interesting to see the horse from the front, from behind, and also from the side. If the horse is spontaneously lame, it is important to grade a “basic” lameness before doing and grading any tests.

A test can be defined as a special condition exerted on the horse that may change its gait. The act of increasing the speed, or putting the horse on a circle is a test. The test is considered good when it can be repeated.

On circles, it is easy to assess abnormal load of one limb (most of the time on the inside) as well as abnormal bending, which might involve back discomfort. The horse should be perpendicular to the longe line and remain on a regular curve. Horses that travel more to the inside or lean to the inside may show some low back pain. Counter bending is associated more with thoracolumbar pain. Any of these defects of bending may vary with front or hind limb lameness to avoid loading of the
sore limb. Most of the lameness seen on circles on hard footing are more indicative of distal limb lameness such as the palmar structures of the foot. This lameness shows a defect of caudal phase on the same rein.

On softer footing, this type of lameness tends to improve, and soft tissue problems including distal collateral ligament issues may be seen more easily. Some soft tissue lameness may show a more severe lameness on the opposite rein. This may be apparent in some suspensory proximal desmitis, and lateral collateral ligament desmopathy on a distal joint.

Fig. 5.

**Biomechanics of Lameness**

The lame horse will present in different ways when showing an asymmetrical gait. This paper will distinguish three types of gait defects, which can also be combined in case of multiple areas or limb lameness:

1. Defect of loading/cranial phase of the stride which is typical of suspensory desmitis. Sometimes it is seen more on opposite circles and on straight lines.
2. Defect of caudal/propulsion phase of the stride is typical of palmar foot pain. In this case, the limb of the horse does not extend behind the vertical line of the stance phase.
3. Defect of protraction of the limb with a deficit of loading is more typical of shoulder pain. When the defect of load phase is not consistent, this it is more often related to lower neck/plexus issues.

Once this step of the exam has been identified and described on the affected limb, different tests can be performed to evaluate a region of pain.

**Flexion Tests**

A segment of a limb interesting one or a few joints are flexed on a limb for a fixed time, usually 1 minute, then the limb is released and the horse jogs away from the practitioner on a straight line. It is important to evaluate how the horse loads the very first step after the test. Watch him go from the side of the horse (especially front limb) to assess what type of gait abnormality the horse might show.

**Fetlock/Coffin Joint Flexion Tests**

These tests give more relevant response for the fetlock joint and surrounding anatomical structures if the horse was previously sound on the straight line or circles both directions.

**Hock/Stifle Flexion Tests**

These tests may include hind fetlocks if the practitioner flexes the toe of hind feet at the same time. The difficulty on hind limbs is to take into account the stay apparatus, which does enable the practitioner to flex each joint separately. A “cross” stifle test has been described (Fig. 7) (unpublished data) where the affected limb is flexed and crossed under the belly of the horse. This test is not completely specific to stifle issues only, but gives significant reason to consider medial stifle joint compartment issues. False positives have been experienced with chronic proximal suspensory desmitis of the same limb. Some of these tests can be administered independently from each other, but they still have a moderate specificity.
Pressure Tests

These tests can be done in order to evaluate a precise area such as a flexor tendon, a suspensory ligament insertion, or a splint. The practitioner applies a certain amount of pressure for at least 20 seconds and lets the horse jog away. A positive test is related to a more pronounced discomfort from the basic jog.

Dynamic Hoof Test

Front feet can again receive pressure (on heels or frog) with a hoof tester for a few seconds and then jog. A positive test will be associated to a sudden lameness and the horse will land with his toe first.

Exam at Canter

The horse is moved on a soft footing at the trot and canter on a longe line in order to evaluate his gait amplitude and elasticity, as well as back motion.

Exam Under Tack

Once the horse is under tack, the practitioner can assess a certain amount of information that a normal clinical exam cannot always find. When trotting, the author expects the rider to rise from his saddle and do a figure eight (approximately 10 m diameter) in order to see how the horse bends on both sides. The rider may be asked to use rising trot without changing diagonals on this figure to evaluate loads of each of the four limbs when sitting in the saddle going both directions.

Significance should be given to the way the horse lands on its four feet and fetlocks and the way it bends and brings both hind limbs under its body. The trajectory of each limb is also interesting to check in order to evaluate possible lack of adduction and abduction of hind limbs.

A significant importance should again be given to freedom and amplitude of front limbs and shoulders, pelvis axial and longitudinal motion, examining the horse from the side, and from behind. At this stage and in case of suspicion, it is interesting to ask the rider their own feeling and ask if there is abnormal symmetry travelling one way or the other.

When the horse is cantering, back motion becomes crucial. Longitudinal bend gives a significant amount of information on the way the horse might even jump. One should also look at the way the horse collects or extends. Each single part of the back from the base of the neck to the base of the tail should be assessed.

With palmar foot pain, it is interesting to evaluate how the opposite limb goes backwards as the horse moves forward on a straight line or circle. The rider more often feels a shorter gait (and a head bob) that the person observing from the ground cannot always detect.

Exam with the Rider in Exercise or Competition

This type of examination has become more attractive from the client/rider point of view, in order to assess subtle discomfort that cannot be seen with a conventional exam. The rider communicates to the equine veterinarian his difficulty to obtain optimum motion of his horse regarding the type of exercise or discipline. This is interesting and informative if shared just before and just after competing. This way, the practitioner can see potential problems occurring after warming up or after extra stress is placed on the musculoskeletal system of the athlete. This would be typical of chronic suspensory issues as well as subclinical muscular issues such as enthesiopathies or metabolic problems.
When competing or doing a course in a show ring, the rider is asking the horse to do its maximum to clear the fence. The speed is increased and the muscular effort is increased.

The rider has chosen a specific gait, a different number of strides in between fences that need to be accomplished as closely as possible to his plans. At this level, the practitioner needs to understand that part and have knowledge of the sport and the amount of difficulties in a course.

Again, the way the horse bends the back in particular phases of the course are interesting. The author checks the horse in different circumstances such as short turn (check, for example, if he changes leads). In short or long combinations, check the ability of the horse to collect or extend his stride.

Two kinds or fences easily show this type of information: 1. River fence followed with 5 to 7 strides on a straight line to a vertical fence, and 2. Small distance combination (7.30 meters) in between two high verticalls (minimum 1.40 m).

The practitioner should look at the horse sideways and see how the rider tries to shorten or increase stride length. From the back or front of the fence, other abnormalities can be evaluated as well.

**Deviations**

If deviations from the longitudinal axis (jumping to the right or left) are not intentionally made by the rider, this should be documented. This abnormality can change the number of strides that the rider has chosen and generates fence faults.

Example of a horse having a perfect clinical evaluation in hand and flexing completely normal.

On the jumps, the horse deviates his whole front end to one side and lands heavy. Feet blocked on both front did not change his attitude; however, the local block of the withers did. Further evaluation on imaging revealed an old fracture of the withers spinous processes which became recently active (additionally, the young horse was growing and very tall).

**Landing on a Preferred Limb**

When deviation becomes obvious, the horse may land on a preferred limb and this could be the major consequence of protecting one or the other limb. A good clinical evaluation of the horse can normally identify part of the answer. When evaluating horses jumping, the author normally avoids using local blocks especially if the radiographic status of the horse is unknown. The author sometimes limits this specific exam to a distal palmar block on the front feet.

**Changing Lead at Canter**

Most of the jumpers may spontaneously change lead, more often on hinds, and very often in turns. Sometimes, these changes occur promptly before a jump and may last for one or two strides. The practitioner should carefully see if these lead changes are related to an action of the rider (as trying to collect or extend the stride of the horse). More often, these are found to be related to acute lumbar pain, or potential sub-clinical ataxia. In some circumstances, lower joint or soft tissue chronic injury (high suspensory desmopathy, fetlock joint, hock joint) could be involved, but would appear more significant in a conventional clinical exam.

**Particular Example of Dressage Horses**

On dressage horses, many riders ask the veterinarian to evaluate the horse’s symmetry. Their goal is to obtain, for example, the same movement (half pass) on the right and left rein. In this particular example, the practitioner should watch for a defect of abduction or adduction. This movement, described as a side motion of the fore and hind limbs, can show abnormal steps or even some discomfort that may not be evaluated on most horses examined in hand or under tack on a straight line. The horse can be seen as he warms up and trots in figure eights. The rider then
may be asked to perform the same exercise, doing both diagonals with half passes in order to assess potential discomfort. It is easy to detect abnormal loading of one of the 4 limbs as we artificially increase side loads on low joints and abduction and adduction of upper joints. As an example, most of the discrete suspensory branches or lumbar soreness can be assessed using these exercises. The veterinarian may feel that radiographs should be taken of the suspected areas first to rule out potential serious orthopedic problems. The practitioner may then use local blocks to confirm their thoughts with the participation of the rider repeating similar exercises. In these cases, the rider can then feel potential changes and communicate with the practitioner looking for gait improvement.

III. CONCLUSION
Clinical evaluation of the musculoskeletal system of the horse is associated with a series of tests which should allow the practitioner to have good assessment of the source of pain. Then, one has a potential diagnosis to be confirmed and documented more specifically with imaging. At that moment, a good clinical exam leads to a better objectiveness of the lesion identified with radiographs or ultrasound exam. The more advanced technology used in medical imaging, the more accurate the clinician will need to be.

Today there are many cases where MRI can show abnormal findings but the practitioner can get lost because they were unable to gather as much information through the clinical evaluation and it becomes a gamble more than a science. This clinical exam, with a very strong method should lead the experienced practitioner to determine the type of issue at hand. Imaging will document the lesion, only if it exists with the choice of imaging made, and only if it can be also imaged.

ADDITIONAL READING