Physical Examination of the Thoracolumbar Spine and Pelvis

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In the athletic horse, back pain is a common cause of poor performance. Diagnosis is difficult because the signs are vague and horses that appear sensitive to palpation or pressure over the back may not necessarily be painful in this area. This situation is complicated by the fact that many affected horses present for alterations in gait or performance abnormalities rather than overt thoracolumbar pain. Adding to the complexity of defining and diagnosing back pain is the paucity of large scale scientific studies in horses. Despite these challenges, honing physical examination skills can enhance the diagnosis of back pain in horses.

Assessment of a horse with thoracolumbar pain starts with obtaining a clear and accurate history. A description of presenting complaint(s), the duration, past and present performance history should be obtained. A common complaint of a horse with a long-standing back problem is alteration in behavior and temperament. For example, affected horses may be difficult to catch, unwilling to walk to the ring or stand still for mounting. Also, information regarding management changes and tack changes, in particular saddle and pad, should be obtained. Rider/trainer changes should be obtained. Poor equitation can be a cause for pain back although difficult to address by the attending veterinarian. An official performance record such as a race record or other types of performance records, should be evaluated. A fall or other traumatic event can be an inciting factor for back pain, especially for acute muscle or other soft tissue injuries. Affected horses may exhibit abnormal stance when urinating or defecating, especially in the chronically affected horse. Another common complaint is difficulty or reluctance to lie down, rise up, and/or roll. Sometimes, the farrier will complain that the horse is “difficult” for shoeing/trimming the hind feet.

Most horses with back pain are not overtly lame but have primary complaint of poor performance. On the other hand, horses with lameness, in particular those that are chronic in nature, can very frequently show evidence of secondary back pain. They may exhibit general decline in the quality of their gaits, unwillingness to jump especially for combination or ground work, lack of impulsion, or resistance during collection work. Affected horses may be stiff, lack flexibility when ridden but appear free and flexible in the paddock. Oftentimes, owners will complain that horses resent brushing across their backs sometimes by kicking or biting at the owner. Generally, sourness or changes in behavior when being saddled is another common complaint. Characteristic “cold backed” horses will often brace and/or ventrally sink in their middle back when the saddle is positioned and the girth is tightened. Riders will also complain that horses resent being mounted by moving away from the mounting block, hunch up their back, pin their ears, swish their tails, or walk with a stiff and stilted gait immediately after mounting.

Other historical complaints include kicking out, bucking, or overall unwillingness to go forward. Sometimes, the riders are able to pinpoint specific movements during which affected horses are more likely to exhibit clinical signs. For example, the horse may buck when asked to canter or refuse an oxer jump or resist collected dressage movements. Other times, general ill defined, consistently inconsistent, changes in gait and behavior are noted.

A detailed physical examination is the next step and the unconditional foundation in the diagnosis of back pain. The purpose of the clinical examination is to determine if abnormalities exist in the back and to determine a suitable way of diagnosing underlying pathology. The cause of back pain can be difficult, at best, to pinpoint. Many times, the diagnosis is by eliminating other possible conditions. Therefore, a comprehensive musculoskeletal examination of the entire body and limbs is always indicated. Other examinations include an assessment of the neurologic system. Assessment by a behavior specialist or another professional rider/trainer may also be beneficial for horses that lack the temperament and/or athletic talent for its intended use.

One condition that confuses the diagnosis, particularly by owners/trainers/riders is the “cold backed” or “thin skinned” horse. “Cold backed” horses typically exhibit hyper-sensitivity over the back, transient stiffness, and marked ventral extension of the back when mounted. Source of pain is rarely found. The “thin skinned” horse displays resentment to palpation and/or
Note the horse’s stance. Some back sore horses will stand pain. More commonly, affected horses have a short choppy lameness should be noted and investigated. It is uncommon for lines, similar to the traditional lameness evaluation. Any rein, on a flat surface. The horse is walked and trotted in straight of gait is performed. The horse is evaluated in-hand, on a loose surface. The horse is walked and trotted in straight lines and in a serpentine pattern. Raising the head while walking can exaggerate subtle neurological signs. Other maneuvers include tail pulling at the walk, backing, and walking up and down a steep incline. Having the horse circling tightly around the handler is also performed. Signs of weakness, loss of proprioception, and/or ataxia may include scuffing of the toes, hypo- or hypermetria, pivoting, circumduction of a limb, and/or loss of balance. Horses with primary back pain do not have abnormal neurological signs. Although horses with chronic low grade neurologic deficits may develop thoracolumbar pain due to change in overall ability to perform coordinated movements especially when ridden.

Clinical examination is further complicated because the most common complaint in horses with authentic back pain is poor performance rather than overt thoracolumbar pain. The poor performer is particularly difficult to evaluate by the clinician due to the vast and sundry conditions that might negatively impact a horse’s performance. Any and all body system failures may result in decreased performance and numerous conditions that do not have obvious physical exam abnormalities especially at rest. This is where the real detective work begins when evaluating the poor performer. Although the focus of this report is evaluation of the back, other body systems should not be overlooked.

Clinical examination of horses with thoracolumbar pain starts with visual observation of the back at rest. The horse should stand evenly and squarely on all 4 limbs. The overall conformation of the horse, in particular the back, should be noted. Abnormal spinal curvature (scoliosis, lordosis or kyphosis) should also be noted. Reported, short backed horses are more prone to bone injuries and long backed horses to soft tissue injuries. Evidence of white hairs along the withers or saddle region can be clues for sites of previous trauma or ill-fitting tack. Muscle symmetry, asymmetry, and overall condition should be noted. The overall impression of “good” vs. “poor” topline should also be noted. A poor topline despite consistent training is a consistent finding in horses with back pain. In comparison, a horse without back pain frequently has a good well-muscled topline when in competition or not. Note the horse’s stance. Some back sore horses will stand parked out or stand with the hindlimbs hunched forward.

Palpation of the thoracolumbar region is another important part of the clinical examination. Palpation usually starts at the withers and ends at the sacral region. Firm but gentle pressure is applied with fingertips along the musculature to the right and left of midline. It is important to assess the horse’s response to focal pressure. In horses with muscle soreness, guarding or splinting may occur in anticipation of palpation. Occasionally, horses will pin their ears, swish their tails, kick, or bite. Focal muscle fasciculations should cease within a few seconds. Prolonged spasm or guarding may indicate underlying pathology. It is also useful to run the rounded tip of a pen along the epaxial muscles from withers to croup. Skin sensitivity is not a reliable indication of back pain but prolonged fine muscle fasciculations is an abnormal response.

After thorough physical examination and palpation, evaluation of gait is performed. The horse is evaluated in-hand, on a loose rein, on a flat surface. The horse is walked and trotted in straight lines, similar to the traditional lameness evaluation. Any lameness should be noted and investigated. It is uncommon for horses with overt unilateral lameness to have primary back pain. More commonly, affected horses have a short choppy stride. Horses are then evaluated while walking and trotting in circles. Assessment when moving in a small figure “8” pattern may also be useful. Horses with decreased suppleness and/or spasm may have difficulty turning. Loss or lack of lateral bending through the topline may be another indicator of underlying thoracolumbar pain.

Gait evaluation continues while the horse is lunged to the right and left at a walk, trot, and canter. Evaluation on hard and soft surfaces may also be beneficial. Ill-defined gait abnormalities that are not exclusive to horses with back pain include, loss of hind limb impulsion, difficulty with downward transitions especially canter to trot, “bunny-hopping”, and/or dragging of the hind feet. Affected horses may move with their heads up and their backs hollow, spine extended. Application of a surcingle can also be useful. Applying pressure across the withers and saddle region may facilitate observation and identification of sites of soreness. A weighted surcingle is particularly useful when abnormal gait or behavior is triggered or exaggerated with weight. For safety reasons, this apparatus is useful when assessing the bucking/rearing horse.

Ridden gait evaluation is also important. The horse should be observed when saddling, girth tightening, and mounting. Abnormal signs include grunting, teeth grinding, tail swishing, extreme ventral extension of the spine, and/or buckling of the hindlimbs. The horse’s gait should be assessed once the rider is mounted. Affected horses may have an exaggerated shortened stride even at the walk. The horse is then ridden at the walk, trot, and canter. Comparison of gait with the rider in sitting position vs. jumping position (half seat) may also be helpful. Horses with thoracolumbar pain may resent contact with the seat, collected movements, and/or changes of pace especially downward transitions. Tail swishing, bracing against the bridle, heavy on the forelimbs, and unwillingness to go forward are common complaints. On occasion, affected horses may buck or rear when ridden. It is important to determine if this is a behavioral issue, a response to poor training, or due to underlying pain.

Gait abnormalities such as lack of coordination in the hind limbs, weakness, stumbling, or an overall disconnect between the front and hind limbs can be observed in horses with neurologic deficits, back pain, or both. The basic neurological examination should include assessment of cranial nerve function followed by gait assessment. Horses are walked in straight lines and in a serpentine pattern. Raising the head while walking can exaggerate subtle neurological signs. Other maneuvers include tail pulling at the walk, backing, and walking up and down a steep incline. Having the horse circling tightly around the handler is also performed. Signs of weakness, loss of proprioception, and/or ataxia may include scuffing of the toes, hypo- or hypermetria, pivoting, circumduction of a limb, and/or loss of balance. Horses with primary back pain do not have abnormal neurological signs. Although horses with chronic low grade neurologic deficits may develop thoracolumbar pain due to change in overall ability to perform coordinated movements especially when ridden.
At the end of the examination, the clinician should have some indication as to whether the horse has primary or secondary back pain. Evidence of abnormalities within other musculoskeletal regions and/or other body systems should also be thoroughly investigated. When trying to determine if the clinical signs are pain or behavior in origin, a 10-day course of phenylbutazone can be instituted. Behavior conditions will not be altered after treatment. Once thoracolumbar pain has been ruled in (or at least numerous other causes are ruled out), additional diagnostics such as diagnostic analgesia and/or imaging are performed to further define the nature of the pathology within the back.

II. PELVIS

True pelvic pain is a relatively uncommon cause of hind limb lameness. The clinical signs of horses with pelvic and hip injuries are variable and non-specific and associated with a myriad of other causes of poor performance. Horses with sacroiliac pain also present with varying clinical examination findings. Historical information combined with thorough physical assessment of the entire pelvic region enhances the diagnosis. Gait evaluation including neurologic evaluation is also recommended.

Pelvic Pain

Clinical examination starts by obtaining a good working history. For racing horses with pelvic stress fractures, a common historical complaint is acute severe unilateral hind limb lameness after a breeze or race. The lameness is transient and resolves within 1-2 days. Few discernable physical exam abnormalities are noted and nuclear scintigraphic evaluation is recommended in any horse with a suspected pelvic stress fracture prior to resuming strenuous exercise. Pelvic injury in the mature non-racing athletic horse is an uncommon cause of lameness except when associated with a traumatic event such as a fall, rearing over backwards, or being cast in a stall.

Next, a physical examination of the pelvic region is performed in a comprehensive and thorough fashion. A solid working knowledge of pelvic anatomy is paramount. Due to the large muscle mass, only the bony extremities of the pelvic girdle can be appreciated. Assessment of symmetry or asymmetry of the pelvis and hind quarters is extremely important and best done in a systematic fashion. The horse should stand squarely and visual inspection of the overall conformation of the pelvis is performed. Careful inspection and differentiation of the bony protuberances and muscle mass should also be done. Muscle atrophy in the pelvic region is very common in horses with pelvic limb lameness or in horses with equine protozoal myelitis as well as horses with underlying pathology of the pelvic region. In horses with pelvic fractures, muscle atrophy or loss can be appreciated as early as 2 weeks. It is important to identify loss of muscle mass but equally important to correlate it with other clinical examination findings. Muscle tone in the tail and anus should be also be evaluated. Flaccid paralysis of the rectum, anus, vulva, and tail may be noted in horses with sacral fractures.

Horses with pelvic fractures commonly have disparity between the bony extremities which is a very important physical examination finding. In horses with a fracture of the tuber coxae, the affected side is lower than the normal side. This can be appreciated while observing the horse from behind. Assistants place their fingertips on the right and left points of the hips and height disparity is recognized. Horses with fractured tuber ischii may have focal depression and/or loss of normal contour. This is also best noted while observing the horse from behind as well. Ventral displacement of one tuber sacrale is commonly noted in horses with ilial wing fractures. Horses with ilial shaft fractures are extremely painful and exhibit severe unilateral hind limb lameness. Horses do not usually resent palpation or flexion of the distal limb however, are often very reactive to abduction of the limb. Fractures of the ischium and pubis are uncommon and affected horses frequently have a history of falling or rearing over backwards. Focal swelling and pain over the tail head and/or deviation of the tail to one side may be appreciated. With chronic injury, muscle atrophy and a resultant depression at the site of injury may also be noted. Another differential in the acute, severe hind limb lameness is fracture or osteoarthritis of the acetabulum. Injured horses may hop on the affected limb or have extremely short protraction when ambling. Horses with chronic coxofemoral joint pain may prefer to canter rather than trot and/or move on three tracks.

Other maneuvers include palpation of the pelvic girdle while auscultation of the region is performed. Gently rocking the pelvis side-to-side and/or direct palpation of the lateral pelvis while the horse is walking may also facilitate identification of crepitis in horses with pelvic fractures. The trochanteric bursa is located between the greater trochanter of the femur and the tendon of the middle gluteal muscle. Inflammation of the bursa and/or its surrounding musculature may be painful during focal palpation and/or manipulation of the region. Because the coxofemoral joint lies just deep to the bursa, differentiating pain from the joint vs. bursa can be challenging.

Sacroiliac Pain

Sacroiliac pain is the result of osteoarthritis, iliac wing stress fractures, or desmitis of the sacroiliac ligaments. The clinical significance of sacroiliac joint pathology is difficult to determine since many presumed normal horses have degenerative changes similar to horses with known sacroiliac pain. Acute sacroiliac injury is usually the result of a seriously traumatic incident like a fall or starting gate incident. Affected horses may be lame and have localized pain and swelling along the tuber sacrale. Horses may exhibit plating, a gait characterized by crossing over each hind limb, with foot placement close to midline as if trotting on a tight wire. Clinical signs of chronic sacroiliac pain are non-specific and varied. Affected horses are frequently categorized as poor performers. Failure to engage hind limb, overall lack of impulsion, poor
hind limb action, and lameness are common complaints. Ridden exercise often worsens the abnormal gait.

The paired dorsal sacroiliac ligaments (DSIL) can be palpated in the croup region as two cord-like structures spanning from the dorsal aspect of the tuber sacrale and extend caudally to insert on the dorsal spinous processes of the sacrum. Firm pressure along the ligaments may be appreciated in horses with injury of the DSIL. Manipulation of the sacroiliac region may elicit a pain response in horses with pathology. To apply dorsoventral sacroiliac stress, the clinician stands on a box and applies rhythmic force along the dorsal aspect of the lumbosacral dorsal spinous processes. Another manipulative test can be performed by applying simultaneous but opposite directed lateral forces to the tuber sacrale and sacrocaudal junction. The clinician applies firm pressure in a left-to-right direction along the left tuber sacrale while pushing the right sacrocaudal area in a right-to-left direction. Theoretically these maneuvers produce compression of the sacroiliac region.6,7 Reportedly, pain response to dorsoventral stress is common in osteoarthritis of the sacroiliac region while response to lateral stress is more common in horses with injured or inflamed sacroiliac ligaments.6,7

The overall conformation of the tuber sacrale should also be assessed. Sacroiliac instability or subluxation is commonly identified clinically as dorsal displacement of the affected tuber sacrale. The resultant unilateral or bilateral prominences are often called “hunters’ or jumpers’ bumps”. However, the clinical significance of this physical examination as a sole finding is nebulous at best; only 5% of confirmed cases of sacroiliac disease have pelvic asymmetry.8 In horses with atrophy or asymmetry of the gluteal musculature and/or generalized loss of topline, the tuber sacrale may also be prominent and usually not a primary site of pain. Firm ventral pressure to the dorsal aspect of the tuber sacrale is variable and inconsistent in horses with and without underlying pathology in this region. The exception are horses with acute tuber sacrale fractures which are almost always reactive to palpation and will often suddenly collapse in their hind limbs in response to pressure.

Rectal Examination

Rectal examination may be helpful in detection of injuries within the pelvic canal. This procedure should be included in horses with a history of trauma to the pelvic region or suspected pelvic fracture. The integrity of the pubis should be carefully examined. Any loss of contour and/or pain along the internal surface of the wing of the ilium and ventral border of the sacroiliac joint should be noted. Obvious abnormal rectal findings in horses with pelvic fractures include loss of bony continuity, sharp bony edges, or soft tissue bulges due to hematoma formation at the fracture site. Gentle rocking of the pelvis in a side-to-side fashion may facilitate the identification of fracture(s) or crepitus. Palpation of the terminal aorta and the iliac branches should also be performed especially in horses with exercise induced hind limb lameness in order to rule in or out aortoiliac thrombosis. Sublumbar muscular pain such as soreness in the psoas muscle may also be appreciated.

Gait Examination

After thorough physical examination, the horse should be assessed while exercising. Initially, the horse is evaluated inward, on a loose rein, on a flat surface. The horse is walked and trotted in straight lines, similar to the traditional lameness evaluation. Any lameness should be noted and investigated. Horses are then evaluated while walking and trotting in circles. Assessment when moving in a small figure “8” pattern may also be useful. Horses with decreased suppleness and/or spasm may have difficulty turning. Loss or lack of lateral bending through the topline may be another indicator of underlying thoracolumbar pain and may help to differentiate between horses with pelvic pain. Some horses with sacroiliac pain and/or stress fractures of the ilium develop a very close hind limb gait or “plaiting.”

Gait evaluation continues while the horse is lunged to the right and left at a walk, trot, and canter. Evaluation on hard and soft surfaces may also be beneficial. Ill-defined gait abnormalities such as loss of hind limb impulsion, difficulty with downward transitions especially canter to trot, and “bunny-hopping” are common complaints in horses with sacroiliac pain. The horse is then ridden at the walk, trot, and canter. Horses with pelvic or sacroiliac pain may resent collected movements, changes of pace especially downward transitions, and backing. Tail swishing, bracing against the bridle, heavy on the forelimbs, and unwillingness to go forward are common complaints. On occasion, affected horses may appear lame, exhibit a disunited gait, or even rear when ridden.

Neurologic Evaluation

Since many horses present for poor performance and/or ill-defined gait abnormalities, neurologic assessment should also be performed in horses with suspected pelvic pain. Gait abnormalities such as lack of coordination in the hind limbs, weakness, stumbling, or an overall disconnect between the front and hind limbs can be observed in horses with neurologic deficits, sacroiliac pain, and/or caudal pelvic pain. The basic neurological examination should include assessment of cranial nerve function followed by gait assessment. Horses are walked in straight lines and in a serpentine pattern. Raising the head while walking can exaggerate subtle neurological signs. Other maneuvers include tail pull at the walk, backing, and walking up and down steep incline. Having the horse circling tightly around the handler is also performed. Signs of weakness, loss of proprioception, and/or ataxia may include stumbling of the toes, hypo- or hypermetria, pivoting, circumduction of a limb, and/or loss of balance. Any neurologic deficits should be thoroughly investigated as part of the comprehensive assessment of these horses.

III. ACKNOWLEDGMENTS

Declaration of Ethics: The author has adhered to the AVMA Principles of Veterinary Medical Ethics.

Conflicts of Interest: The author has no conflicts of interest.
REFERENCES


