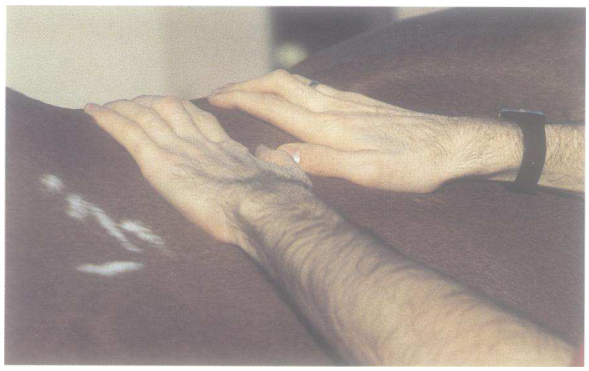
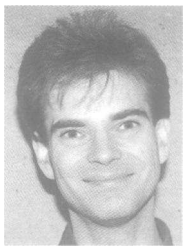


Palpation – an important component in the assessment of a horse with a suspected back problem

Assessment of back pain in horses

EDDY CAUVIN



Eddy Cauvin qualified from Alfort veterinary school, Paris, in 1990. He completed an MVM at Glasgow veterinary school and, subsequently, Horserace Betting Levy Board-funded residencies in equine surgery at Glasgow and Edinburgh veterinary schools. After a spell in equine practice in Essex, he was awarded a lectureship in equine surgery at the Royal Veterinary College, where he is currently working towards a PhD. He holds the certificate in radiology and in equine surgery (orthopaedics).

BACK pain is common in horses yet, in many cases, a definitive diagnosis remains elusive. The aim of this article is to present a systematic approach to the patient with a suspected back problem. For the present purposes, back pain is defined as pain arising from the thoracolumbar or sacral spine and associated soft tissues. Examination of the pelvis is also included.

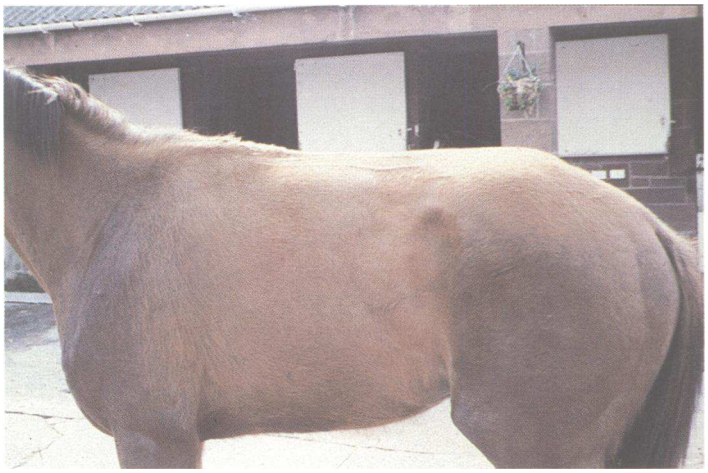
HISTORY

The history of a horse presenting with a suspected back problem yields important information and should be taken carefully because significant changes may be subtle. The type of horse and activity performed are particularly relevant. In the author's experience, axial skeletal disorders are most commonly recognised in adult athletes, especially show jumpers and eventers; heavy framed, long-backed thoroughbreds are predisposed to axial soft tissue injuries; standardbreds, quarter-horses and other short-backed animals have a higher incidence of vertebral injuries, such as overriding dorsal spinous processes, a condition which is also common in

Mystique and hearsay surrounding back pain

Back pain is often considered to be common in horses but a definite diagnosis in an individual animal is difficult to achieve. The problems are twofold. First, most of the veterinary literature on back problems in horses is based on clinical observations and extrapolations from other species and, unfortunately, is rarely corroborated by scientific evidence. In particular, large scale postmortem studies are scarce and few studies have attempted to correlate clinical signs with pathological findings obtained postmortem. Secondly, the horse's dimensions render most ancillary diagnostic methods futile, forcing one to rely, often solely, on the history and clinical examination. Unfortunately, specific clinical signs are usually lacking or are highly subjective and a diagnosis has to be obtained by eliminating other causes of lameness or poor performance. Back pain may also be secondary to chronic lameness originating in the limbs. Horses should therefore be assumed to have a problem elsewhere in the skeleton until proven otherwise.

These limitations in diagnosis, coupled with a lack of openness on the subject on the part of the veterinary profession, have paved the way for many non-veterinarians to set up diagnostic and therapeutic services, often with no veterinary involvement. They have also led to a certain amount of hearsay. For example, ovarian abnormalities ('sore ovaries') are sometimes blamed for poor temperament or back pain. However, this is unlikely, as ovarian lesions cause visceral pain and abdominal discomfort (colic) rather than referred skeletal pain. Similarly, it is often claimed that vertebrae or the pelvis are 'out' (ie, displaced or out of alignment) and that they can be 'put back in' with manipulations. This has been shown to be impossible. The vertebral bodies are strongly linked by very stiff intervertebral disc material and the vertebrae are further joined by a number of strong ligaments, which blend into the bone (see right). Noticeable spinal flexion is only achieved by the cumulation of tiny movements between each vertebra along the spine. Significant displacement between adjacent vertebrae implies the presence of fractures. Likewise, sacroiliac subluxation involves severe damage to the joint and associated ligaments, and cannot be manually reduced.



(above left) Acquired kyphosis (roach back) in a three-year-old thoroughbred. Note the flat to upwardly convex thoracolumbar spine and sloping pelvis.
(above right) Acquired lordosis (sway back) in an aged brood mare
(Pictures, Professor S. A. May)

warmbloods and in racing thoroughbreds; while congenital spinal disorders, including sacralisation of the last lumbar vertebra, hemivertebrae (wedge-shaped vertebral bodies causing spinal deformities) and block vertebrae (fusion of several vertebral bodies), are more common in Arab horses.

Developmental syndromes, such as osteochondrosis, are rare in the thoracolumbar spine, but can affect the lumbar articular processes. Acquired kyphosis ('roach back') can occur in young thoroughbreds in association with flexural limb deformities. Marked lordosis or 'sway back' (ie, ventral deviation of the spine) may develop in aged animals and is observed frequently in brood mares; although this deformity can be severe, it is rarely associated with clinical signs. Skeletal lesions, including degenerative disease of the articular processes and spondylosis deformans, are common incidental findings, and are an occasional cause of back pain.

The history often suggests a progressive or sudden change in temperament. Some horses become aggressive or 'cold backed' (resent tightening of the girth or mounting, with no other abnormal symptoms). Exercise intolerance and poor performance, however, are usually the main complaints. Sometimes the horse hesitates or refuses to jump and jumps are poorly executed. Affected horses also perform less well in the dressage ring, due to lack of impulsion and suppleness.

The signs can be dramatic but, in most cases, are progressive in onset and mild. Presenting signs also vary between individuals, regardless of the severity of the underlying lesions.

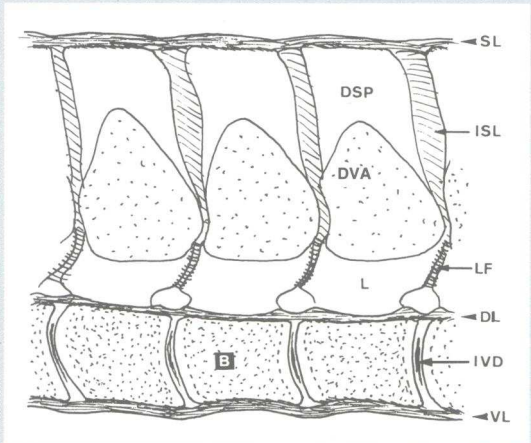
GENERAL CLINICAL ASSESSMENT

A routine clinical assessment should be performed to rule out other causes of poor performance, changes in temperament or posture. Generalised muscle pain and weakness may be manifestations of an underlying systemic disorder, for example.

The horse should first be assessed in its normal environment, in a quiet location, to detect any abnormalities in stance, posture or behaviour and to assess its reactions to its handlers. A resting examination of the appendicular musculoskeletal system is performed, as is a basic neurological assessment to rule out primary neurological problems (see Mayhew 1992).

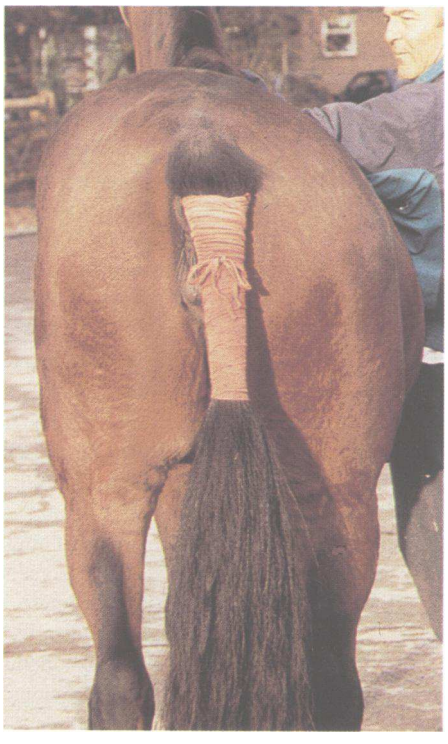
The back should then be examined for any obvious abnormalities or swellings, before running the hands gently (without exerting any pressure) along the spine. Any areas of heat, swelling or obvious muscle spasm should be noted. Skin lesions, saddle sores and warble fly infestation should be discounted at this stage.

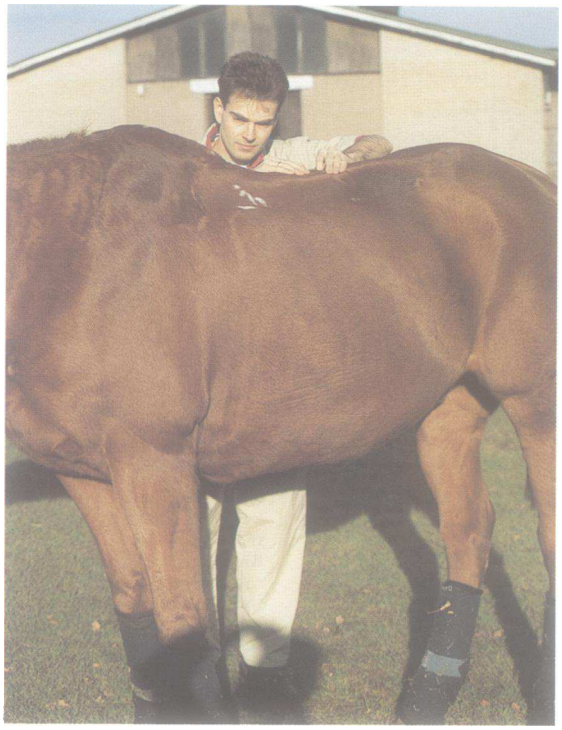
Finally, the horse may be taken outside and stood squarely on a flat, even surface in order that it can be examined from all sides. This allows an assessment of the symmetries of the spine, epaxial muscles, pelvis and tail. Asymmetry is a common, but unspecific, sign of back and pelvic problems (muscle wastage may be caused by any chronic limb disorder).



Longitudinal section of the lumbar spine (after Barone 1989). The vertebrae develop by metameric division within the embryonic cord, so that the vertebral bodies (B) are located within a continuous column of fibrous tissue. The intervertebral disc spaces (IVD) consist of a tough fibrocartilage which blends with adjacent vertebral bodies. The latter are also connected by strong ventral (VL) and dorsal longitudinal ligaments (DL), which blend into the periosteum. The vertebrae are further stabilised by the ligamentum flavum (LF) between the laminae (L), which is very fibrous in horses, the interspinous ligaments (ISL) between the dorsal spinous processes (DSP) and the continuous, thick supraspinous ligament (SL). DVA Dorsal vertebral arch

Severe pelvic asymmetry in a two-year-old filly, due to an ilial shaft fracture





(left) The dorsal midline is palpated to look for any focal pain or swellings

(above) The epaxial musculature is palpated by running the palms along the sides of the spine

(right) Deep palpation, using the fingertips to press firmly on both sides of the spine, may elicit an abnormal reaction in horses with back pain

EXAMINATION DURING EXERCISE

In most horses with suspected back pain, the signs are found to be due to an underlying chronic lameness. Bilateral hock disorders, particularly 'bone spavin', are often diagnosed, but both hind- and forelimbs may be affected simultaneously, causing complex multiple limb lameness. There may be secondary back pain, induced by the abnormal posture and imbalanced loading of the thoracolumbar soft tissues, but often the abnormal motion is felt by the rider and wrongly interpreted as back pain. Therefore, all the usual steps of a routine lameness work-up should be undertaken.

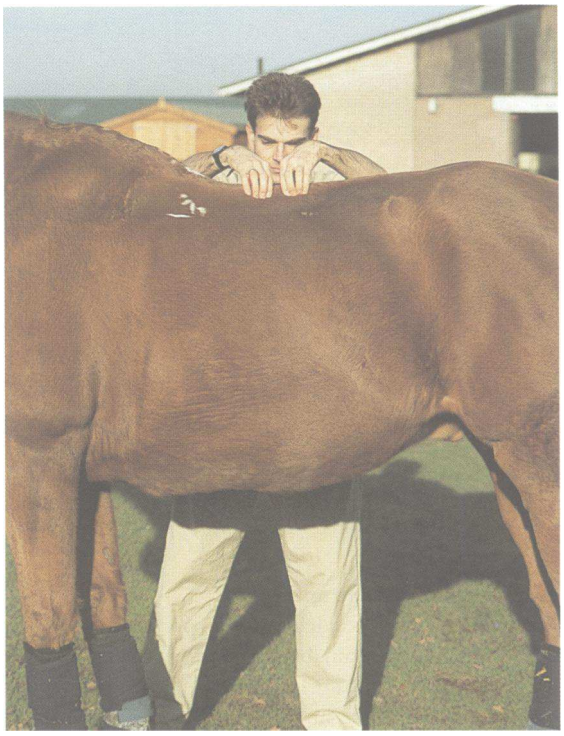
The horse should first be walked and trotted in a straight line on a flat, hard surface. The lead rope should be kept loose, to allow the horse to move its head freely. Any gait abnormalities, as well as the general attitude of the horse, the position of the tail and pelvis, and any abnormal curvatures of the spine and pelvis should be noted. *Horses with a primary back problem do not present with overt lameness,* but rather a poor general gait, stiffness, and abnormal movement of the back and pelvis. There may be a shortened stride length and lowered foot flight arc in the hindlegs; reduced limb flexion at the hock and stifle; and exaggerated flexion or extension of the sacroiliac and/or lumbosacral articulations causing, respectively, a 'bunny hopping' gait or a very stiff, 'flat backed' gait, where the whole back and pelvis appear very flat and rigid. These signs, however, may also be present in horses with chronic hindlimb lameness. Sacroiliac disorders and pelvic fractures, on the other hand, nearly always present as frank, bilateral or unilateral hindlimb lameness.

The horse should then be examined on a wide circle on the lunge, at all gaits and, ideally, on both soft and hard surfaces. Variations in the stride appearance are easier to identify on the lunge, and any lameness may be more obvious. Horses with a sore back tend to resent lateral spinal flexion on one or both sides, and often move sideways or refuse to turn in one direction. Unfortunately, many normal horses, particularly if poorly trained or young, work very poorly on one rein. It may be useful to compare the gait with video footage obtained before the problem developed, if available. Where possible, the horse should be led up and down a slope. This is often resented by horses with back pain, due to the increased forces transmitted to the back and increased involvement of the sublumbar and gluteal muscles.

Ideally, the horse should also be examined under its own saddle, first lead and then ridden by its usual rider. Many horses with back problems appear relatively normal when exercised in-hand, but are uncomfortable when ridden. Abnormal reactions to various degrees of tension of the girth may indicate focal pain in the saddle area or a behavioural problem (cold back). Mounting may cause marked discomfort and the horse may show markedly shortened strides and poor tracking in circles. In severe cases the horse may arch its back or become extremely stiff and rigid. Behavioural problems can sometimes be difficult to rule out.

Flexion tests should be carried out as the last step in this phase of the investigation and should be interpreted with caution. Hock flexion (spavin test) is not specific for the hock, but also causes flexion of the fetlock and digit, and stifle and hip (reciprocal apparatus), rotation of the sacrum and pelvis and increases weightbearing on the opposite leg. Many horses with pelvic or back problems resent the lifting of one hindlimb. Some animals react violently to this test; others become very stiff when trotted away but frank lameness is rarely encountered with thoracolumbar problems.

Whenever a lameness is observed, it should be investigated fully, with the use of regional and local analgesia. Lack of a positive response to tibial and peroneal nerve blocks and intra-articular analgesia of the stifle joints does not confirm the presence of a back problem, and it may be difficult to locate the area of pain in these cases.



SPECIFIC EXAMINATION AND MANIPULATION OF THE BACK

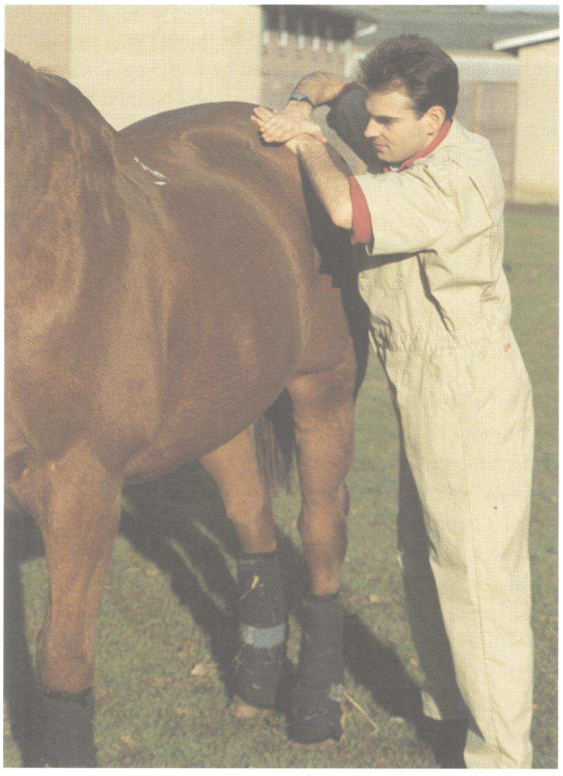
Palpation

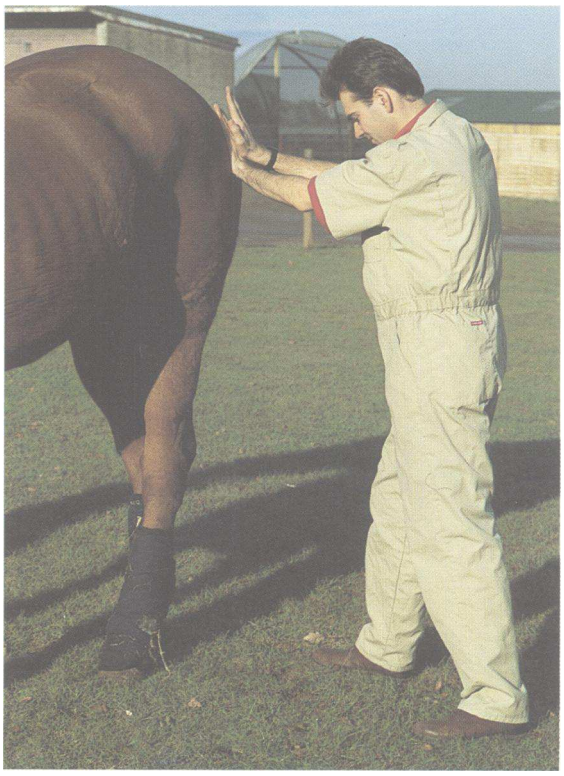
Closer examination of the back should start with a further visual inspection, assessment of the symmetry and gentle palpation. This may reveal subtle local signs, which may intensify with exercise. In some horses, severe spasms of the longissimus dorsi and other epaxial muscles on one side may cause a functional scoliosis (lateral curvature of the spine). In these cases, pressure applied over the affected muscle(s) is very painful and may cause the horse to buck, rear or move away. A horse with a cold back or behavioural problem may react similarly.

Deep palpation is carried out by applying firm pressure with the fingertips down the midline and then along both sides of the spine. The supraspinous ligament can be felt, except in overweight animals, and any focal swelling should be looked for. It is difficult to feel the top of the dorsal spinous vertebral processes or intervertebral spaces, but the location of the latter is indicated by a slight dip in the outline of the supraspinous ligament. Horses with overriding dorsal spinous processes rarely resent deep palpation.

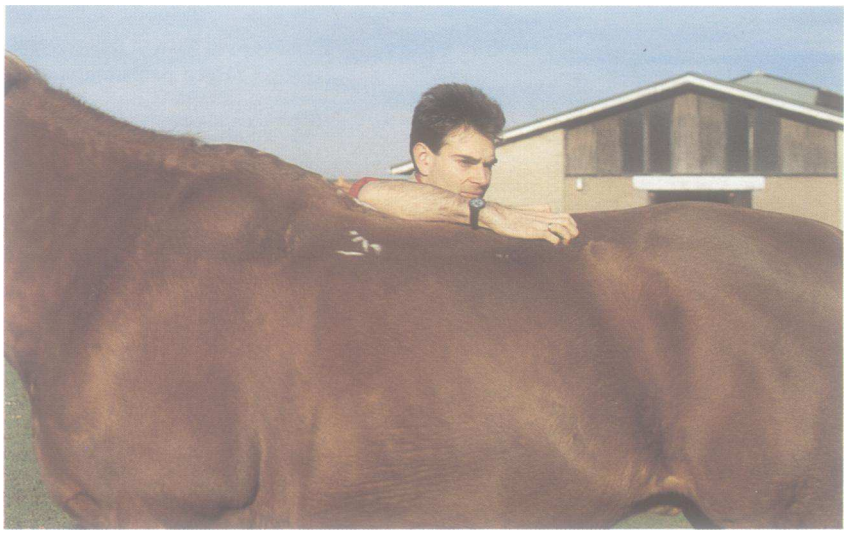
Deep palpation over the longissimus dorsi muscles may demonstrate areas of heat, tension or hardness. It may also cause a focal spasm, which should always be regarded as abnormal. Deep pressure applied with the fingers on both sides of the spine simultaneously may also elicit an exaggerated response; a dipping (dorsiflexion) of the back is unlikely to be significant, but a violent reaction should be regarded as suspicious. Palpation over the tuber sacrale may reveal asymmetry or thickening of the dorsal sacroiliac ligament. The tuber sacrale can be very difficult to feel in well-muscled or overweight animals, hence subtle abnormalities may not be detectable. Most, but not all, horses with sacroiliac injuries resent deep palpation in that region. Likewise, superficial and deep palpation of the gluteal muscles, tuber coxae and greater trochanters of the femurs may help to locate focal pain.

Pain and instability of the pelvic girdle can be assessed by pushing the tuber coxae ventrally and medially using both hands. This will elicit a strong response in horses with a fractured ilium, sacroiliac joint disease or fractured tuber coxae ('knocked-down hip'). Similarly, pressure can be applied over the coxofemoral joint by placing both hands over the greater trochanter (point of the hip) and pushing briskly in a medial direction. Pain in this area may be due to fractures, joint disease, gluteal myopathy or trochanteric bursitis.

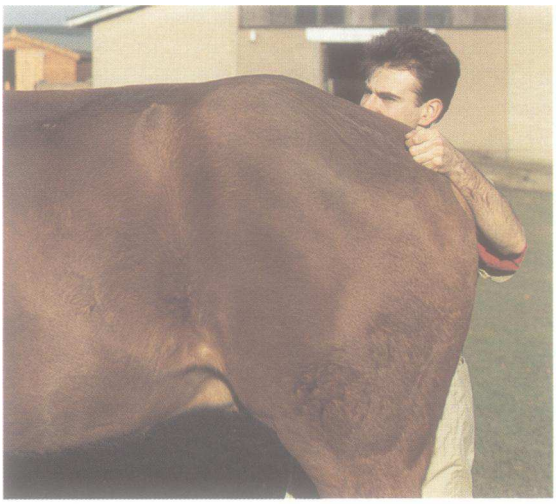


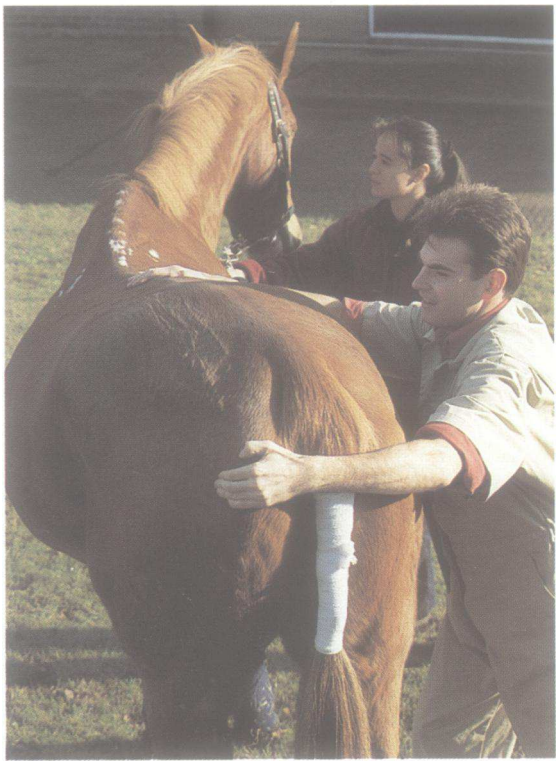


(left) Pressure applied vertically on the tuber coxae is often resented by horses with fractures or sacroiliac injuries. (right) Pushing briskly on the greater trochanter of the femur (point of the hip) may be painful in horses with hip disorders or pelvic fractures



(right) Dorsiflexion is induced by applying firm pressure on each side of the lumbar spine. (below) Ventroflexion is induced by stimulating the caudal gluteal muscles





Lateral flexion of the spine and pelvis is achieved by pulling the tuber ischii while simultaneously pushing on the caudal thoracic spine

Manipulation of the spine

Manipulation of the spine is an important step in the assessment of back pain, but should be carried out last as it may cause sustained discomfort. The aim is to induce curvature of the spine in all directions in order that the amplitude and suppleness of movements, reactions of the animal (indicating pain), and presence of clonic contractions (spasms) and abnormal reflexes can be assessed.

- VENTRAL CURVATURE of the spine (dorsiflexion) is achieved by applying deep pressure on both sides of the spine, cranial to the tuber sacrale. Some horses show slight discomfort, but most flex their spine smoothly, without violent reactions.
- DORSAL CURVATURE (ventroflexion) is achieved by applying pressure dorsal and caudal to the greater trochanters, over the caudal gluteal muscle mass, placing one hand each side. This causes arching of the back and flexion of the lumbar, lumbosacral and sarcroiliac articulations, increasing the slope of the pelvis.
- LATERAL CURVATURE of the lumbar spine can be obtained by pushing on one loin with one hand, while pulling the pelvis with the other hand placed behind the tuber ischii on the opposite side of the horse. The patient should not resent this and should bend the spine evenly.

More complex movements may be obtained by applying pressure on various points simultaneously.

These manipulations achieve only a few degrees of curvature, but horses with a painful back may keep their spine very rigid or react violently to the procedure. It may take some practice to find the best points over which to apply pressure and, with experience, it is possible to manipulate the spine in a continuous, slow motion to assess the general suppleness of the back.

Rectal palpation

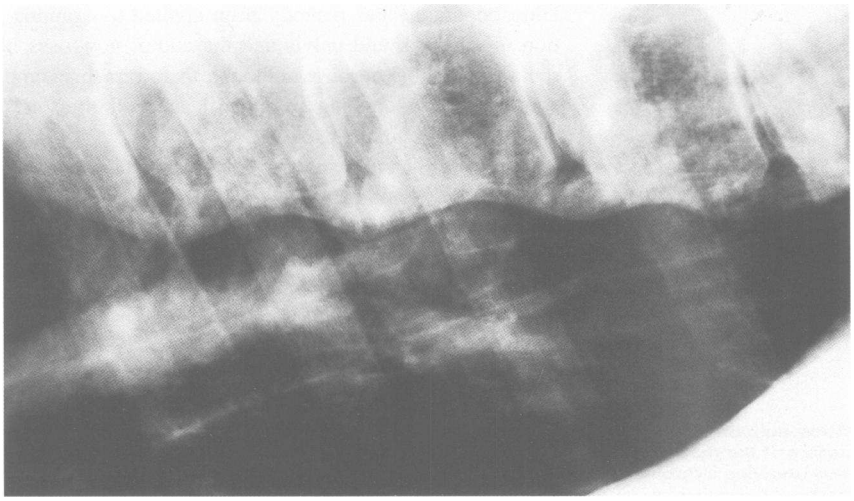
Examination of the ventral aspect of the caudal lumbar and sacral spine may be carried out per rectum and occasionally reveals swelling. This may help to identify fractures. Crepitus may be encountered with some pelvic fractures. Ventral spondylosis deformans of the vertebral bodies is occasionally palpated through the sublumbar muscles. It may also be useful to look for evidence of aortoiliac thrombosis; this condition, characterised by focal fremitus at the caudal aortic bifurcation and a decreased pulse in the iliac arteries on one side, may cause signs of focal myopathy and lumbar pain, as well as hindlimb lameness.

Radiography

Radiographic imaging of the spine is largely limited by the thickness of the surrounding soft tissues, particularly in the lumbar area. In the thoracic spine, the prominent spinous processes are readily identifiable and the air in the lung fields provides good contrast around the vertebral bodies. Radiography of the lumbar spine is generally unrewarding, although the tips of the dorsal spinous processes may be seen. The lumbar soft tissues generate scattered radiation and fast film/screen combinations (400 to 1000 speed) and the highest possible mA setting are required in order to reduce it. The effects of scatter on the films are diminished by using high ratio grids, cross grids or a Potter-Bucky moving grid, which necessitate in excess of 100 mA. Powerful, fixed x-ray units are therefore necessary. A system of linear tomography has been described for the radiographic examination of the pelvis, but this technique is not generally available (Jeffcott 1983).

Radiographs only demonstrate bony lesions, such as fractures, osteolysis (infections and tumours, which are rare), and severe new bone production (spondylosis and osteoarthritis). Ventral spondylosis and overriding dorsal spinous processes are often detected, but are not necessarily clinically significant.

Radiography of the pelvis may be useful in some cases to confirm the presence of fractures or coxofemoral joint arthritis. It may be possible, using high power units, to carry out an examination in the standing animal, but general anaesthesia is usually necessary. Sacroiliac diseases are difficult to confirm radiographically.



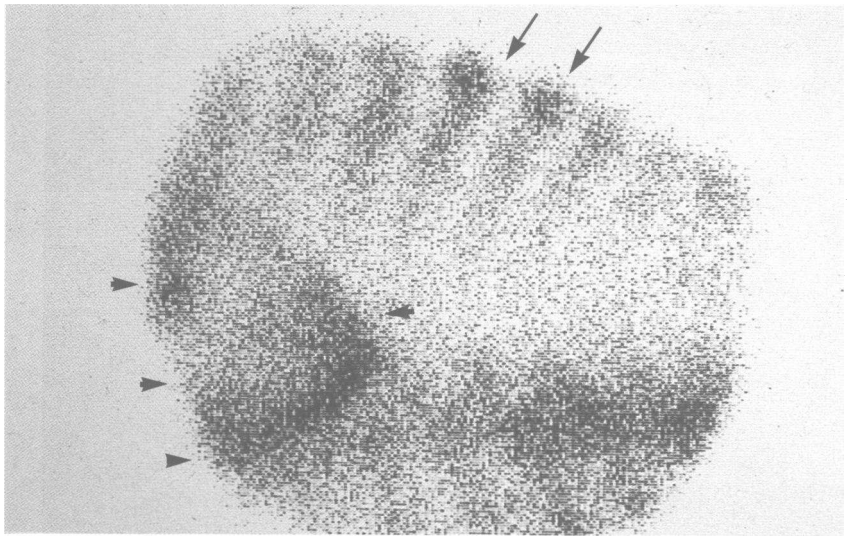
Radiograph of the caudal thoracic spine. The gas in the lung fields allows adequate imaging of the thoracic vertebral bodies and ribs. Note the smooth new bone bridging the ventral aspect of adjacent vertebral bodies. In this case, ventral spondylosis was an incidental finding on chest radiographs

Scintigraphy

Gamma scintigraphy has become one of the most useful techniques for imaging the proximal limbs and spine of horses and is now widely available in this country. Bone scans, using technetium 99m-labelled MDP (methylene diphosphonate), are the most useful for the back and pelvis. This pharmaceutical agent is selectively taken up by bone, highlighting any areas of increased bone metabolism (destruction or synthesis). The technique is extremely sensitive for detecting active bone lesions, including fractures, new bone (osteoarthritis, spondylosis and callus formation), infective processes and bone tumours.

Unfortunately, scintigraphy is often unrewarding in back and proximal limb soft tissue injuries, which are the most common causes of primary back pain. These lesions may be detected early on, but by the time patients are presented for examination no abnormal bone activity is present. A soft tissue scan can be performed 15 to 30 minutes after the injection of an isotope, but the isotope tends to accumulate rapidly in the kidneys and bladder, making images of the overlying axial skeleton uninterpretable. Also, it may be difficult to carry out a complete examination of the spine, pelvis and proximal limbs before the radiopharmaceutical is removed from the soft tissues.

Pelvic disorders are easier to demonstrate scintigraphically, and the technique has been shown to be very sensitive for the detection of chronic fractures, joint disease and sacroiliac sprains and subluxation. Gamma cameras are easier to use and more sensitive than hand-held point probes for the spine; both are suitable for the pelvis.

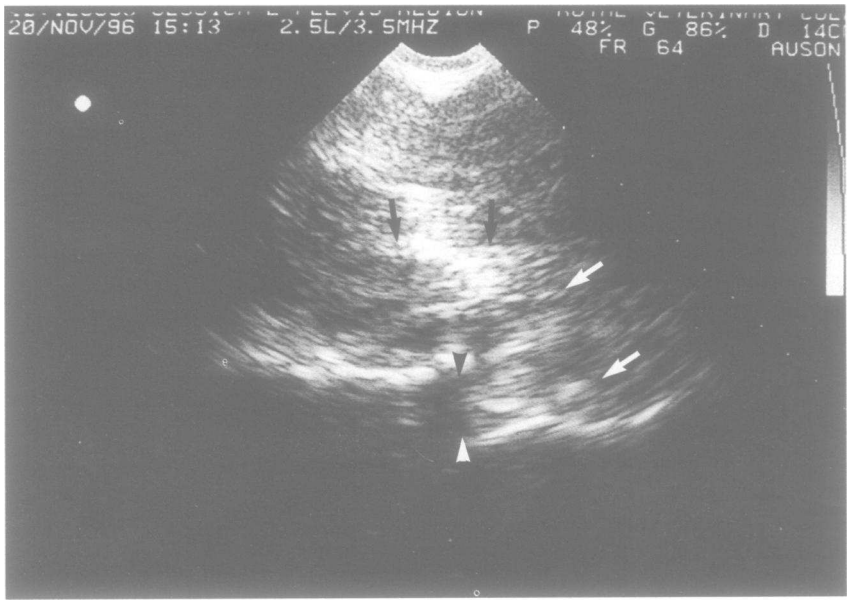


Computer-generated scintigraphic image (bone scan) obtained with a gamma camera. This lateral view of the cranial thoracic spine (left is cranial) shows an increased uptake of radioisotope in two dorsal spinous processes in the withers region (arrows). These 'hot spots' were caused by fractures of the affected processes (arrowheads). Note that the cranial thoracic spine is obscured by the scapula

Ultrasonography

Ultrasonography has recently been applied to examination of the back and pelvis and the author now uses it routinely for this purpose, although there remains some controversy surrounding the significance of ultrasonographic changes in the back.

To perform an ultrasonographic examination, the dorsum should be finely clipped, over an area 20 to 30 cm in width, extending from the withers to the base of the tail. The skin is cleansed and gel applied several minutes in advance of the procedure, to improve sound transmission. High definition, 5 to 9 MHz transducers are required; the author prefers the use of linear transducers, which give better resolution in the near field and yield superior longitudinal images to sector and curvilinear array transducers. The examination should be carried out in both transverse (cross-sectional) and longitudinal (sagittal and parasagittal) planes, starting on the midline, and proceeding along both sides. To allow for comparison of the two sides, it is advisable to scan systematically over short distances on each side at a time.

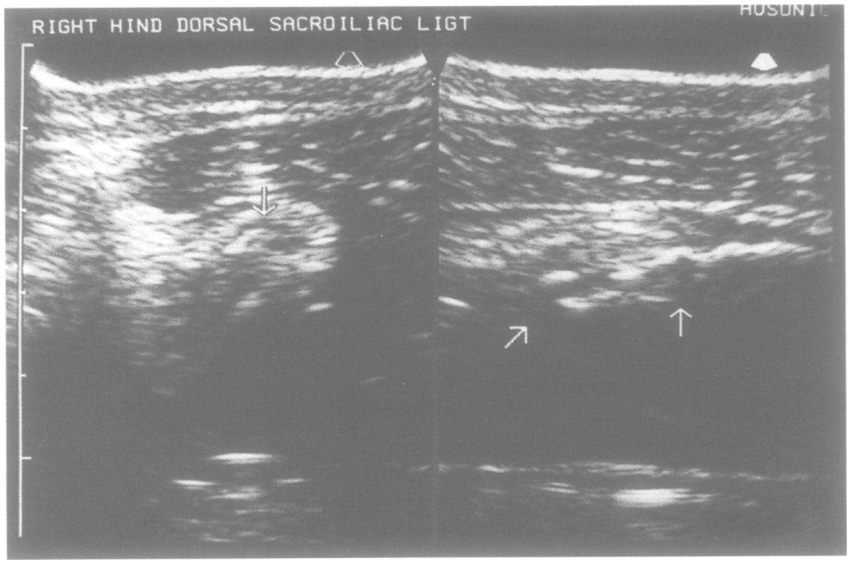


Ultrasonogram of the surface of the shaft of the ilium showing a chronic fracture. A gap (arrowheads) is seen in the outline of the bone, with irregular bone at its edges. It is surrounded by mottled, bright (echogenic) soft tissue (arrows), representing an ossifying fibrous callus and fibrosis of the overlying muscle

The supraspinous ligament has an echogenic, striated appearance, similar to that of tendons. Its thickness decreases slightly over the spinous processes. The latter are visible as hyperechoic interfaces, casting an acoustic shadow; they may be separated from the ligament by a normal, hypoechoic (dark) cartilaginous cap. Focal areas of thickening and altered echogenicity, varying from anechoic (black) to hyperechoic (very bright), sometimes with areas of mineralisation (echoes which cast a strong acoustic shadow), may be encountered and are believed to represent areas of ligament sprain. The clinical significance of these lesions, however, is uncertain. Crowding or overriding dorsal spinous processes ('kissing spines') are visible ultrasonographically – the tips of the spines appear very close together, with marked narrowing of the affected interspinous spaces. In some cases, pseudoarthrosis may be imaged as an anechoic area, surrounded by a well-defined echogenic capsule. New bone is often seen at the tips of the spines, characterised by irregular bone contours, but this may be normal.

Muscle injuries are more difficult to detect ultrasonographically. Normal muscle appears as a hypo- to anechoic structure, containing a fine network of echogenic fibrous tissue (perimysium) and surrounded by a well-defined echogenic layer (fascial planes and epimysium). Affected muscle may be increased in size in comparison to the contralateral side or, more frequently, may show an increased echogenicity, with thickening of the connective tissue septae within the muscle. In acute cases, very little is seen.

Ultrasonography of the pelvis is more often rewarding. Provided the skin is soaked with warm water for several minutes, it is possible to scan the pelvis without clipping, using a low frequency sector transducer (2·5 to 3·5 MHz). However, better quality images are obtained after clipping the hair. The author uses 3·5 to 5 MHz curvi-linear or sector probes to examine the ilial wing and shaft and the hip joint, but prefers 7·5 MHz linear transducers for examining the sacroiliac region and the tuber coxae. The wing of the ilium is scanned systematically along several mediolateral lines between the tuber sacrale and tuber coxae, then along several lines in a cranial to caudal direction. The shaft is followed from the tuber coxae to the coxofemoral joint in both trans-



Ultrasonograms of the dorsal sacroiliac ligament. (left) The transverse image shows an irregular, hypoechoic area within the dorsal sacroiliac ligament (arrow), over the caudal edge of the right tuber sacrale. (right) A longitudinal scan of the same ligament shows the presence of an irregular sacral insertion (right-hand arrow points to the surface of the sacrum) and a localised hyperechoic area, casting an acoustic shadow (left arrow), consistent with mineralisation within the affected ligament
(Pictures, Dr C. Marr)

verse and longitudinal planes. Ilial fractures (injuries most frequently seen in juvenile racehorses) can be easily detected. In the early stages, a gap or step is seen in the surface of the ilium. This gap can be followed to determine the configuration of the fracture. More chronic fractures appear as irregular areas, protruding from the otherwise smooth surface of the bone, and surrounded by hyperechoic fibrous tissue (callus formation). A normal fascial attachment near the centre of the ilial wing can produce a similar appearance. In this case, a comparison with the opposite side should be made.

Ultrasonography of the coxofemoral joint is difficult, but it is possible to assess the joint capsule thickness and to identify the presence of a joint effusion.

The sacroiliac joint, because of its morphology and position, cannot be imaged ultrasonographically. However, the position of the tuber sacrale can be assessed to confirm displacement in sacroiliac subluxations. Similarly, the thickness and echogenicity of the dorsal sacroiliac ligaments, which run caudomedially from each tuber sacrale to insert on the sacrum, may be altered in cases of sacroiliac strain or subluxation.

FURTHER INVESTIGATIONS

Laboratory tests may help to detect chronic or acute muscle damage. Resting muscle enzyme activities (aspartate aminotransferase, creatine kinase and lactate dehydrogenase) are rarely elevated and a slight rise may be difficult to interpret. An exercise tolerance test is therefore more useful: baseline levels are measured in a blood sample obtained before exercise; the patient is then worked on the lunge or ridden for 30 minutes at the trot and canter, and blood samples are obtained 20 minutes, three hours and 24 hours later. A slight initial rise, followed by a return to baseline levels within 24 hours, is normal. If a significant amount of muscle tissue is damaged, the enzyme activities will usually increase dramatically and remain high beyond 24 hours.

Infiltration of local anaesthetic between the dorsal spinous processes may be useful to localise pain. Five to 10 ml of lignocaine or mepivacaine is injected around each suspicious interspinous space – ideally, under radiographic guidance – with a 5 cm, 19 to 21 gauge needle. (Forcing the liquid into the interspinous ligament may cause damage and is not necessary.) This test is often positive in cases of overriding dorsal spinous processes, but rarely helpful with soft tissue injuries. Also it may be difficult to detect an improvement if the presenting signs are subtle.

The infiltration of corticosteroids is common practice and may provide temporary relief in focal soft tissue inflammatory conditions, although the long term beneficial effects have not been proven. This may be used as a diagnostic test as well as a therapeutic procedure. The steroids may, however, cause focal mineralisation within the supraspinous ligament and tendinous attachments of the longissimus dorsi, the consequences of which are unknown. The use of systemic pain killers, such as oral phenylbutazone, may help to confirm the presence of pain if it results in a definite improvement, and can help to differentiate between a behavioural problem and back pain.

Electrical stimulation of the epaxial musculature, using faradism or other types of stimulators, is a technique used by physiotherapists in human sports medicine. It may be useful in horses for detecting focal areas of pain or muscle damage – the stimulation may cause painful spasms or, in rare, chronic cases there may be no contractile response. The author has obtained useful information using this procedure, but it does not rule out secondary back pain from chronic limb lameness or a poorly fitting saddle and the findings should be interpreted in the light of other clinical tests.

OPTIONS FOR MANAGEMENT

At the end of the assessment all the findings should be interpreted together. In many cases, no specific signs are detected and only a suspicion of a back problem is obtained. Conservative therapy – based on box rest and physiotherapy – can be instituted, but it is paramount that other differential diagnoses, such as lameness, are ruled out before initiating any therapy or offering a prognosis. An attempt should be made to determine whether a soft tissue or bony lesion is more likely. If a lesion has been identified, a definite diagnosis must be based on solid clinical evidence. In the absence of a specific diagnosis, one should refrain from making hasty conclusions regarding the prognosis.

Surgical treatment may be attempted in cases of overriding dorsal spinous processes and some fractures, but the possibility of other sites of pain, which may compromise the outcome of the procedure, must be ruled out. Chronic soft tissue injuries generally carry a guarded prognosis, but these lesions are difficult to confirm and some sort of treatment, including rest, controlled exercise and appropriate physiotherapy techniques, should be attempted for several months before declaring the horse unfit for work.

Back problems are generally multifactorial disorders and it may also be useful to try to identify and address 'environmental' factors which may participate in the clinical presentation. For example, an unfit, poorly muscled horse is more prone to soft tissue injuries and less able to work under a saddle. A proper, progressive training programme should be established for these animals. Poor riding ability or a rider who is too heavy for an individual horse should also be identified, as this may cause discomfort to the horse and cannot be addressed by medical means. Finally, a horse with a back problem should be kept as light as possible and the diet altered accordingly.

References

BARONE, R. (1989) Anatomie Comparée des Mammifères Domestiques, Vol 2, 3rd edn. Vigot, Paris

JEFFCOTT, L. B. (1983) Technique of linear tomography for the pelvic region of the horse. *Veterinary Radiology* **24**, 194-200

MAYHEW, I. G. (1992) Equine neurologic examination. *Journal of Equine Practice* **14**, 13-19

Further reading

DENOIX, J. M. & PAILLOUX, J. P. (1996) Physical Therapy and Massage for the Horse. London, Manson Publishing

JEFFCOTT, L. B. (1985) Conditions causing thoracolumbar pain and dysfunction in horses. Proceedings of the 31st Annual Convention of the American Association of Equine Practitioners, Toronto. pp 285-296

JEFFCOTT, L. B. & DALIN,, G. The sacroiliac joint of the horse and chronic changes associated with poor competitive performance. Proceedings of the 31st Annual Convention of the American Association of Equine Practitioners, Toronto. pp 335-352