

**OSTEOPATHIC MANUAL THERAPY  
AND EQUINE KISSING SPINE**

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# Acknowledge

As a veterinary physiotherapist and manual therapist (MIAAT, MT MIRVAP, FEI PET), I work on bringing comfort in terms of locomotion to horses suffering from kissing spine syndrome. Back pain or discomfort is very common in leisure and sport horses. But the lack of research and care protocols encourages me to look for new solutions. This is how I chose the approach of osteopathic manual therapy of the kissing spine as a subject of study.

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# Introduction

Kissing spines, also known as Dorsal Spinous Process Impingement, is the most common cause of back pain in horses (Coomer, 2013). It has been found that 39% of horses have kissing spines but it does not cause problems in all horses (Turner, 2011).

According to a survey that I conducted in 2022 in partnership with the IAAT (International Association of Animal Therapists), 54% of owners of horses suffering from kissing spines syndrome would call on the osteopath after the diagnosis and treatment carried out by the veterinary surgeon (Beaussart, IAAT, 2022).

It is anatomically obvious that the kissing spine is irreversible. A certain number of horses suffering from it will not show back pain, or a drop in performance. For a certain other number and depending on the work required, kissing spines can become a real handicap.

*Apart from veterinary treatments and physiotherapy, can osteopathic manual therapy bring comfort to the horse's back, limit pain and improve locomotion which can be severely degraded in certain subjects?*

*What would be the positive outcomes of a follow-up by an equine osteopath concerning horses suffering from kissing spines? What are the possible acts in osteopathic manual therapy concerning a horse suffering from kissing spines?*

# Origin of the syndrome

Research has shown that the kissing spines syndrome in horses is not recent. In the 11th and 12th century an archaeological study shows horses suffering from the syndrome. "The most common effect of excessive loading of the spine in horses are changes associated with osteophytes on the spinous processes" (kissing spines syndrome), (Makowiecki, 2022).

Regarding the origin of the syndrome, it seems that the results of research on kissing spines are often contradictory, leaving the owners intellectually in the dark. The true underlying cause of kissing spines is not completely understood (Zeiger, 2018). Nevertheless, scientific advances, particularly in terms of research on possible genetic origins and feedback from practitioners in the field, are modifying the approach to the syndrome.

55% of owners believe that the origin of the kissing spines might be genetic. 44% are positive that the appearance of the syndrome is due to poor riding practice (38% are not sure but remain oriented in this direction). 92% think that horses are put to work too young. 44% think (and 32% are sure) that there is a link between the adjustment of the material and the appearance of the syndrome (Beaussart, IAAT, 2022).

Some owners insist that putting horses to work too young with unsuitable exercises is the main cause of kissing spines. This includes the idea of quickly putting the horse into a frame by adding many "gadgets". Others address ergonomic issues throughout the equine's life (Beaussart, IAAT, 2022).

Even though the origins of kissing spines syndrome are unknown, there is an important and very recent advance regarding a possible genetic factor. A genetic variant is associated with the severity and likely development of kissing spines in horses. The variant is or allele is on chromosome 25. This single nucleotide is linked to an average increase in one kissing spine severity grade for each of the horse's two copies of the allele, one from each parent (Patterson, Whitaker, 2022). Indeed the genetics: one severity grade higher for each copy (Lesté-Lasserre, 2022).

Finally it should be noted that in the case of thoroughbreds a large number of kissing spines is observed. This is related to the conformation of the spinous processes and their relatively short distance in this breed. But also in connection with genetics and working at an extremely young age.

# Diagnosis and management by the veterinary surgeon

*The diagnosis can only be made by the veterinary surgeon. First of all, what are the prerequisites for diagnosis and what medical attitude to adopt in terms of treatment before setting up a protocol involving an osteopath?*

Poor performance or a change in performance is often the most common finding in horses with back pain. Back pain may be primary or secondary to pain or lameness located elsewhere in the horse. An accurate history starts with the signalment of the horse. The temperament of the horse, use of the horse, its level of performance, a change in the level or style of performance, the time and length of onset of the chief complaint, and any prior history of lameness are important clues. It is important to determine if any other significant changes in behavior, eating habits, attitude, or performance have occurred. Some of the more important physical or behavioral signs (Benson, 1999).

In veterinary medicine the signs (in relation to the horse owner questionnaire) are: Tail swishing, Grinding teeth, Head shaking, Rushing fences, Loss of appetite, Resentment of saddle, Resentment of grooming, Sinking when rider mounts ("Cold Back"), Failure to bend or yield to aids, Poor jumping or other performance, Failure to break from the gate, Stumbling, tripping, Obscure lameness, Sour attitude, Bolting, Rearing.

Some horses with back pain may have abnormal posture. Some horses may appear anxious or fearful. Horses with back pain may undergo behavioral changes related to acceptance of commands or aids such as failing to jump, stopping, not yielding to aids, not bending or collecting, or developing a sour attitude (Benson, 1999).

Then comes the physical examination by the veterinary surgeon and the diagnostic tests. X-ray might be the final test confirming a possible kissing spines syndrome. Diagnosis is normally a combination of symptoms displayed, reduced spinal movement and X-Ray. The most common site of the problem is at T15 (Marcella, 2015). There are a number of treatment options available to horse owners ranging from simple saddle fitting to invasive surgery (Marcella, 2015). The most common is steroid injections to control pain and inflammation. Finally when none of those two methods are successful surgery is the final option.

Then there will be the post convalescence which can involve the osteopath, the physiotherapist, the farrier and the riding instructor.

I do not detail the complete examination by the veterinary surgeon. This is solely the responsibility of the veterinary surgeon and no other actors in equine health can intervene. Nevertheless, the observations in terms of history seem interesting to prepare the consultation of the osteopath. But it also makes it possible to understand the medical history of the horse and therefore to take the necessary precautions according to the state of the equine.

# Thermography

Thermography is a tool which, if used well, can be handled by a large number of therapists, therefore not reserved for the sole veterinarian surgeon. The scientific interest is demonstrated below. The interest for the osteopath can be important because it allows to keep a register of the interventions and to prove the modifications.

About thermography, the image proved to be the most useful diagnostic test to differentiate kissing spines cases from other causes of back soreness prior to radiology (Miller, 2011). Thermography can be a valuable, practical and rapid investigation tool. But also thermography could appear as a useful tool in terms of prevention on horses showing signs of reduced performance. However the proper use of thermography to evaluate surface thermal patterns requires a controlled environment and rigorous adherence to an imaging protocol to eliminate errors of interpretation (Soroko, 2016).

Thermography would allow a follow-up in terms of change with regard to the evolution of the syndrome. By taking all the precautions and keeping in mind that only the veterinary surgeon can intervene in terms of diagnosis, the tool that is thermography can accompany the practitioner throughout the care provided in post convalescence.

# Practical approach for horse owners

I place the practical approach via horse riding carried out by the owners upstream. It is essential to understand the life of the horse as a whole before thinking about any form of action. That is to say the relationship with the owner, the rider and the living environment of the equine. But also to be able to follow the evolution of the teams working around the horse such as the farrier, the veterinarian, the physiotherapist, the dentist...The intervention of an osteopath being done after the veterinary diagnosis and the treatment if necessary, it is also important to understand the exercises practiced with the horse before starting an osteopathic approach to the horse. Also the exercises recommended by the different practitioners will have an essential role in the overall treatment of the animal.

As detailed in the origins of the kissing spines syndrome, the practice or rather bad practice of riding is an original source bringing problems and therefore a risk of kissing spines. This may be associated with a genetic factor. Unfortunately in a practical approach there is never a single culprit but multiplications of small clues revealing a complex problem with regard to the owner of the horse.

The intensive work of horses that are too young is seriously questioned by many professionals. The lack of warm-up and preparation before moving on to intense exercises is also often a problem observed in the stable. Finally, the horse's harness or equipment, starting with the saddle, which is sometimes poorly adjusted or adapted, is a recurring problem. It has been reported in many studies that a contributing factor to back pain in horses is a badly fitting saddle. An ill-fitting saddle can contribute to pain on palpation, direct and compensatory overt lameness, gait alterations, and behavioral changes (Soroko, 2018).

According to Turner: “the most important aspect of any treatment regimen is the exercise program” and the exercise must achieve the goal of the horse moving freely forward in a relaxed frame. Turner thinks that the kissing spines syndrome is consequently, predisposing conformation coupled with specific use and inappropriate riding technique may be the contributing factors to development of the condition. Saddle fit to rider technique and exercise regimen should be carefully evaluated and monitored to help prevent kissing spine syndrome. Cornille said “Kissing Spine develops from an incorrect combination of lateral locomotor patterns, which can only be done with the horses in motion. Basically competent equitation is the horse’s best therapy.”



# Structure and biomechanical approach of the equine back

The back is the centerpiece of the equine musculoskeletal system and hence of crucial importance for performance. There is an increase in reported back problems, but the difficult accessibility of the equine back makes diagnosis, therapeutic interventions and the evaluation of the effect of any such interventions into somewhat hazardous and very subjective procedures (René van Weeren, 2004).

*Knowledge of the normal functional behavior and mechanical properties of the vertebral column is important to understand the pathogenesis of back lesions, to identify the clinical manifestations of back pain, and to ensure a rational approach to physical therapy (Denoix, 1999).*

## **Bony structures:**

The spinal column of the horse starts at the occiput of the skull and ends approximately 50 elements later at the end of the tail. Like virtually all mammals, the horse has 7 cervical vertebrae (C1-C7). There are 18 thoracic vertebrae. The spinous processes of the thoracic vertebrae increase rapidly in size with Th2-Th9 forming the basis of the withers. Normally, the tip of Th5 or Th6 forms the highest point of the withers. *The spinous processes have a backward inclination from Th1-Th14. The 15th thoracic vertebra has an upright spinous process, and the processes of the remaining thoracic vertebrae and of the lumbar vertebrae have a forward inclination. The change in inclination of the spinous processes of the caudal thoracic is often the seat of the kissing spine that is therefore in relation to the anatomical conformation.* The thoracic vertebrae have many articulating surfaces. There are 6 lumbar vertebrae. Their vertebral bodies are longer than those of the thoracic vertebrae, and their spinous processes shorter. They are positioned very close to each other and the processes of L5 and L6 normally articulate, as do the processes of L6 with the wing of the ileum. The large transversal processes give this part of the spine little mobility. The sacrum is made up of 5 sacral vertebrae. The structure is completely rigid. The sacrum is connected to the ileal wings by the sacro-iliac joint. The number of coccygeal vertebrae is very variable, between 15 to 21.

## **Ligamentous structures:**

The ligamentous structures that form part of the back can be divided into short and long ligaments. The interarcual ligaments between the vertebral bodies belong to the short ligaments. The structure is fibrous. The short ligaments also comprise the interspinous ligaments that connect the spinous processes and the intertransverse ligaments between the transverse processes of the lumbar vertebrae. The interspinous ligaments are non elastic, except for those in the area of the withers where the spinous processes will make large excursions. The longitudinal dorsal ligament is one of the long ligaments. It runs over the bottom of the spinal canal, dorsal to the vertebral bodies, from C2 to the sacrum. The ventral longitudinal ligament runs ventrally to the vertebral bodies from Th8/9 until the sacrum. It is an heavy, elastic structure running from the occiput until the first sacral vertebrae.

## **Muscles:**

The M. multifidus forms part of the deep layer and has been designated as the longest muscle of the body. It consists of a long series of muscle bundles, reinforced with ligamentous strips, that run from the sacrum, the lateral sides of the spinous processes of the lumbar vertebrae and the transverse processes of the thoracic vertebrae to the spinous processes of the vertebrae. The origin are articular processes of the thoracic, lumbar and sacral vertebrae. The insertions are spinous processes of more cranial vertebrae. The function is to stabilize the vertebral column, spinal extension and lateral flexion. The innervation is dorsal branches of thoracic and lumbar nerves. This muscle is equipped with many proprioceptive receptors which make it very sensitive to postural variations, which allows them to permanently readjust the vertebrae to protect the spine from any improper movement (Burgeau, 2019). *Regarding this muscle, I wanted to bring its important role in relation to back pain, therefore in connection with the kissing spines syndrome.* Although there are many inciting causes of back pain, these often lead to a common pathway involving changes in neuromotor control and neurogenic atrophy of m. multifidi. The multi-layered and multi-directional fibers of this muscle stabilize the intervertebral joints in the face of bending and torsional moments. Inactivation and atrophy result in spinal instability and micromotion of the joints that predispose to further injury and degenerative changes, thus setting the scene for recurrent episodes of back pain (Clayton, 2012).

The M. spinalis dorsi is another part of the deep layer running from the spinous processes of the lumbar and the last thoracic vertebrae to the spinous processes of the first thoracic and last cervical vertebrae, thus in the same craniodorsal direction as the M. multifidus. M. longissimus dorsi, in a superficial layer, is in volume one of the largest muscles of the body. The muscle origin are spinous processes of lumbar and last 6 thoracic vertebrae. The insertions are spinous processes of the 1st 6-7 thoracic vertebrae and last 5 cervical vertebrae. The functions are stabilizing the back and neck. But also elevating the neck and flexing laterally. The innervation is dorsal branches of the cervical thoracic and lumbar nerves.

M. iliocostalis dorsi, a smaller muscle that runs from the transverse processes of the lumbar vertebrae and the ribs to attach some segments further on the caudal edges of ribs 1-15. The fiber direction of this muscle is cranioventral, so opposes the deep layer. It should be noted that almost all epaxial musculature is located dorsal to the spinal column. The origin are cranial and lateral surfaces of the 3-18 th ribs, thoracolumbar fascia and transverse processes of lumbar vertebrae as far back as L4. The insertions are caudal borders of the ribs and transverse process of C7 and caudal margin of the ilium. The functions are extending and bending the back laterally. Other functions are to retract the ribs, to stabilize the vertebral column and to assist expiration. The innervation are the dorsal thoracic nerves

## **Innervation:**

As far as the innervation is concerned, it is developed above in connection with each muscle. I wanted to add that there is the spinal cord. It is surrounded and protected by the meninges and is located inside the vertebral canal. Nerves from the spinal cord and segmental spinal nerves innervate the limbs. There are also many nociceptive receptors located in the fascial structures of the horse's back.

**Biomechanical:**

The basic movements of the equine spine are ventro and dorsiflexion (or extension and flexion in the sagittal plane), lateroflexion or lateral bending, and axial rotation. These movements can be translated at the level of the individual vertebra into 3 rotations in an orthogonal coordinate system: one around the X-axis (flexion-extension), one around the Z-axis (lateroflexion), and one around the Y-axis (axial rotation) ((René van Weeren, 2004).

The walk involves the most complex movements of the vertebrae. Engaging the deep muscles closest to the vertebrae on either side of the spine. The walk is a very beneficial aid to proprioception.

At the trot, the movements of flexion and extension of the spine are passive. This is due to the inertia of the intestinal mass. It is the limbs hitting the ground that are involved in repercussion back movements. When the feet are on the ground, the back arches since the intestinal mass pulls the spine down. The back stiffens thanks to the abdominal muscles which resist the accelerating force of the intestines. When the feet are off the ground, the back lifts, as the bowel mass pushes the spine upwards. The back stiffens this time thanks to the muscles of the dorsal chain in order to avoid excessive bending of the back.

The back muscles are very active at a canter. These are indeed the muscles that will mobilize the horse's back. The intestinal mass is passive in this gait and follows the movements of the back.

# Osteopathic approach of the equine back

Regarding the specific approach to the horse's back, he first comes back to a global approach with regard to different axes: pain, muscle spasm and autonomic changes.

Pain sensation is an obvious effect of injury but is difficult to quantify in animals. Due to the nature and origins of the horse, the primary interest of the horse is to make adjustments and carry on moving. The horse's ability to compensate is recognized as important. Although there may be acute pain in one region, there will often be order areas of long standing dysfunction, apparent on observation and palpation, with which the horse has coped by making adjustments to the way it moves (Pusey, 2007). The problem interferes with performance when the horse can no longer make adequate adjustments. This is seen first in the history made by the owner of the horse when there is significance of minor asymmetry and imperfections for a rather long period. This leads to a particularly painful area without necessarily knowing the cause. There is also the possibility that the area has been treated but the treatment is only effective for a short time, and the problem returns becoming persistent with an increase in frequency, intensity and duration. This is very present in the pains observed next to the horse's back. Both perceptible in the history of the owner in connection with a loss of performance, discomfort with grooming, refusal to work (installation of the saddle is difficult or is not accepted)... But also with different compensations observable over time in gaze from areas farther from the equine's back. Such as forelimbs that have retraction restrictions or lateroflexion of the neck with permanent restrictions.

Muscle spasm is another common finding on palpation and causes a number of problems. One result is that it will restrict movement, and the owner may report signs ranging from short striding to general stiffness (Pusey, 2007). In the particular case of the horse's back, restrictions of the spine may appear. A study was carried out to compare back mobility in a group of horses attending an osteopathy clinic (Livingstone, 2001). With markers at the withers and on the lumbosacral junction it was possible to measure the movements of flexion and extension of the spine. Horses that have been followed in osteopathy show a larger area of extension compared to the flexion phase. Muscular stretching in addition to its mechanical action has an endocrine action. Muscle stretching stimulates the local release of hormones allied to the insulin related growth factor. The result is an increase in the number and length of the sarcomeres which form the building blocks of the muscle fibers (Goldspink, 2022). Thus the restoration of the topline allows a time off work for the equine and it is observable a better mobility of the horse's back in freedom in the meadow. Muscles are not only involved in producing motion. They also have an important sensory function (Pusey 2007). This is all the more remarkable with regard to the horse's back. Especially with regard to M. Multifidus where its function in terms of proprioception has been demonstrated in addition to its function in terms of locomotion. Movements are made by a complex interaction of agonist and antagonist muscles. This interaction is unconscious and orchestrated by patterns of neuronal activity from the spinal cord called central pattern generators (Pusey, 2007). For optimum function, this neural activity needs to be modified in response to environmental changes. It is a constant stream of proprioception information from sensors found in muscles and joints.

Along with pain and muscle spasms are the autonomic changes that are associated with injury. A painful stimulus is related to the activation of the parasympathetic system. The central response gradually recedes but increased sympathetic activity may persist on a segmental spinal cord level alongside pain and muscle spasms (Pusey, 2007). This is related to the diffusion and distribution of blood. The answer is that the vascular wall drives the blood from the skin to the muscles. This can be observed with the help of thermography. On a normal horse a reproducible thermography pattern is observed (Turner, 1986). Thus a change or variation in surface temperature shows metabolic activity in a specific area, and therefore the presence of a malfunction. Thermography (used correctly and in a specific context) makes it possible to show dysfunctions in specific areas. In the case of the horse's back area, thermography is an excellent indicator that can be coupled with X-rays with regard to areas of dysfunction such as the kissing spines syndrome.

*Osteopathy can have an effect on pain, muscle spasms and autonomic changes. Osteopathic treatment aims to increase mobility which increases afferent input from proprioceptors of muscles and joints which act to inhibit or 'gate' pain pathways (Pusey, 2007).*

# **Conformation of the horse during work and position of the sacrum**

The horse is predisposed to back injury by virtue of the type of work and intensity of competition to which it is subjected nowadays (Jeffcott, 1979).

It is experienced that the conformation of the back and therefore the posture of the horse is essential. In the sense that certain postures are more at risk with regard to a possible aggravation of the kissing spines. There is an essential role of the placement of the sacrum in relation to the back. It is necessary to differentiate the axis of the cranial zone mainly with the risk of a sacrum too high or too low compared to the horizontal axis. Visual observation and then palpation can determine the position. Also in the history provided by the owner, it is important for me to make links with the horse at work and not just in observation without a rider in the saddle. When a rider has an easy seat and light hand, and the horse has his neck in front of the vertical, with the feet balanced and the saddle shaped to allow the back to flex and lift, the spine should come into flexion and the sacrum should move so that the cranial portion of the sacrum is slightly higher than the caudal portion. In these cases, the horse's back lifts and the tail lowers. Conversely, in the case of a rider with a driving seat or heavy hand, a horse with his neck behind the vertical, a banana-shaped saddle that puts pressure on the back preventing a rounded flexion, or a horse with negative palmar angles (especially in hind end), the opposite sacral position may occur. Some of the common osteopathic immobilities are associated including a depression or lack of motion in the cranial aspect of the sacrum, and in L4, L5 or L6. Often, the pelvic portion of the sacroiliac joint will lack full motion and be unable to move dorsally and medially (IVCJ, 2022).

# **Osteopathic manual therapy treatment regarding horses suffering from kissing spines syndrome**

There are different approaches and different treatments because the horse suffering from the kissing spine syndrome can induce other problems.

I think it is also interesting to make links with areas of frequent pain. The kissing spine syndrome is frequently found in thoroughbreds. And ulcers are often observed in thoroughbreds suffering from the kissing spine syndrome. Also I think it is interesting to make links with the behavior of the animal. The behavior when it is handled but also the behavior when the horse is in the box or free to move in the field.

Most of the time the owner will involve the osteopath after the passage of a veterinarian. The visit of the veterinarian will be carried out because the owner is in front of a horse which has a drop in performance and sometimes defensive behavior when it touches its back or puts down the saddle.

It should also be noted that horses have different feelings of pain. Some are very sensitive, others are very stoic. I believe it depends on the breed of animal, age, and working habits. It is obvious that this must be taken into account. A young 4-year-old thoroughbred risks overreacting compared to a 14-year-old school horse in an equestrian center.

There is first a static observation allowing the osteopath to look at the conformation of the equine, the skeletal proportion and the regional structures. Regarding the back, a muscular symmetry will be observed. The back should be straight. The length of the back will also be scrutinized because of the mobility coming from the conformation. Regarding the kissing spine syndrome, asymmetry and loss of muscle development can be sought.

Then the dynamic observation. From the back there is a search for symmetry and fluidity of movement, oriented in the case of a horse suffering from kissing spine in relation to the pelvis and hips with an appreciation of the sacroiliac and the lumbar region mainly. During the long turn the lateral flexibility will be observed with regard to the back more specifically. Spinal mobility is scrutinized. From the front, movements and possible restrictions of the neckline will be observed. In side view the stretching of the thoracic spine will be specifically observed. As well as possible restriction with regard to the lumbar spine and pelvic. It will also be noted the muscular contraction of the back in dynamics if observable.

At the trot it will be more difficult to have a specific approach with regard to the back because the spine is held in a straight line. It is also obvious that the kissing spine will influence the general musculoskeletal examination. Nevertheless, the trot being a specific pace with regard to the muscular contraction of the muscles of the back, it will be possible to observe differences in terms of action.

Then the palpation examination of the horse. It will obviously be global addressing the horse in its entirety. But concerning the kissing spine it could be more specific or pushed in the thoraco-lumbar area. It will be necessary to pay attention to the reactions of the horse especially if the kissing spine can be diagnosed as severe. I also make the link with an apprehension of the horse contracting certain muscles as it approaches palpation, which can either indicate painful areas or skew the observations. With regard to the spinous process, a search for mobility will be observed. Pain during palpation, especially in the caudal thoracic region, will undoubtedly be a marker of kissing spine syndrome. It is important to check this area because it can also be sensitive in the event of poor adjustment of the saddle. During the palpation of the back, it is necessary to keep an eye on the reaction of the horse. For example if approaching the caudal thoracic the horse brings and lowers its ears firmly behind.

Then we will observe if there are restrictions in thoracolumbar flexion and extension. Restrictions in extension or flexion movements are an additional clue to a horse suffering from kissing spine syndrome. We will also observe the possible restrictions in thoracolumbar lateroflexion and lumbosacral flexion.

In the case of the kissing spine syndrome, it is common to observe significant densities of the erector spinae. Sometimes bilateral, sometimes unilateral. Also by experience in connection with the natural conformation of the horse on certain severe or untreated kissing spine, it is possible to observe a loss of stability during the active retraction of one or both forelimbs.

The treatment techniques will vary according to the acceptance of the horse. During the application of the techniques it will be essential to keep an eye on the reactions of the horse to avoid increasing the pain in an involuntary way. In the case of the first consultation and if on palpation of the spinous processes and adjacent tissues the horse has strong reactions, I think it is preferable to work on areas related to the mobility of the back, of course, but in a more cranial or caudal to the overreaction zone. The horse's back is complex and difficult to handle. For this, if the zone itself is not possible, it is possible by creating links to approach other zones.

*Thoracic spine, the techniques are:*

- Lateral mobilization of the thoracic spine. This technique will start with the withers and then progression in a caudal direction. During pushing and pulling the tips of the spinous process around T14 and then caudally until the lumbar, it will be necessary to be very careful that this is the most common site of kissing spines. Both this can indicate and confirm a lack of mobility but also it is quite possible to have a reaction on the part of the horse.
- Springing technique. Again, special attention will be paid around T14.
- Push and pull technique. Again, special attention will be paid around T14 then caudally. It would be normal to note a significant lack of mobility of the thoracic at the level of the kissing spines. Knowing that this technique will be performed on both sides, it is very likely that one side in terms of palpation of muscle tissue offers a slight better mobility of the thoracic that can either be biased by the asymmetrical feeling described above, or real thanks to lower muscle density providing better access to thoracic spines.
- Mobilization using the tail as a lever. Technique far from the possibly sensitive area of the kissing spines, it allows flexing and stretching the thoracic spine.



### *Spinal reflexes:*

- Thoracolumbar spinal flexion. This technique makes it possible to test and increase the mobility in flexion of the spine. This is relatively in the cranial area of the possible kissing spine area. It is nevertheless important to verify the abdominal muscles by palpation, as these can lead to restrictions.
- Lumbosacral spinal flexion. This technique makes it possible to test and increase the mobility in flexion of the spine. This is relatively in the cranial area of the possible kissing spine. It is nevertheless important to verify the abdominal muscles by palpation, as these can lead to restrictions.
- Thoracolumbar spine extension. This technique makes it possible to observe the mobility which should be restricted in the case of a kissing spine. Also it is close to the area that may present a particular sensitivity.
- Thoracolumbar spine flexion and extension. I differentiate this technique because it is an act close to the stretching of the vertebral column performed in physiotherapy. It is a question of acting by reflex on the sternum and on the point of the buttocks allowing to have a back in flexion extension. The advantage is that at the same time it allows to test the global mobility of the back and to be able to stretch in the search to improve the amplitude of movement by gradient applying gestures far from the sensitive zone of the kissing spine.

The techniques I have just mentioned are very localized in relation to the horse's back. Horses suffering from kissing spines will have functional links with other anatomical areas. The latter can also show restrictions. Also if the area next to the horse's back is very sensitive, too painful and causing behavior that can be dangerous for the practitioner, the owner and the horse, it is interesting to consider a more peripheral approach.

### *Cervicals:*

- Cervical exercises and tests. Cervical lateroflexion on the left and on the right allows a better mobility of the cervical obviously but also can also stretch the cranial thoracic spine. It is possible to stretch the cervical and the dorsal chain as a result, by realizing an extension of the horse's head towards the ground. And also by bending the horse's head by bringing it between the forelimbs.

### *Lumbar spine:*

- Functional technique. This technique makes it possible to stretch the erector spinae, a muscle mass grouping together the different extensors of the back. These muscles can show significant densities in the case of a kissing spine.
- Lumbar spine springing. This technique corresponds to thoracic springing but applied to the lumbar spine with the same effects. Even if far from the sensitive area of the kissing spine, it is observed in many horses a significant sensitivity with regard to the thoracic but also often the lumbar so it is important to take measures concerning a risk of pain that may appear.

- Rocking the lumbar spine. This technique, by producing an oscillation through the entire spine, allows the muscle chain to be released and stretched.

#### *Lumbosacral junction*

- Lumbosacral flexion. This technique makes it possible to work on the lumbosacral junction directly and acts on the spinal spine in its length.

#### *Sacrum*

- Mobilization and soft tissue. This technique makes it possible to work on the soft tissues making them more tender and associated with the mobilization to act on the positions of flexion and extension of the sacrum.

Finally, it is important that the horse has no restrictions in terms of protraction of the hind limbs. Because if the horse engages correctly, this will allow a back in a frame that brings comfort to horses suffering from kissing spines syndrome. This is why different techniques related to the protraction of the hind limbs can be performed. Especially if during the dynamic observation when restrictions are found. Finally during the test phase, the horse's loss of stability with a retracted foreleg is a clinical sign of a possible kissing spines syndrome. It would therefore be interesting to work on the retraction of the forelimbs. In addition to improving comfort and locomotion, improving the limbs will be an important benefit when the horse is taken care of by the farrier. Horses suffering from kissing spines syndrome may have loss of stability or difficulty presenting the front or rear limbs when being picked up by the farrier.

# Other Osteopathic connection

Above I mentioned very sectorized osteopathic techniques with regard to the thoracolumbar area. However, it is possible to make other osteopathic connections with regard to the treatment session. The diaphragm and psoas are intimately interwoven and connected right at Th17, Th18, L1 and maybe all the way to L3. (IVC, 2022) This area is often where the back of the saddle rests. Often the saddle does not balance properly. Also the saddle can exert excessive pressure on this area. It is also advisable to check the saddle or to call a saddle fitter in case of doubt.

One side of the diaphragm is attached at the underside of the spine and transverse processes and the other side attaches to the edges of the ribs and also to the caudal portion of the sternum (IVC, 2022). Restrictions in the sternum, ribs and wide area behind the withers may be present. The mobilization of the ribs and sternum would be interesting to explore.

Finally, in practical observation, it is important not to limit a horse to a targeted problem such as kissing spines syndrome. First, there is a frequent link between kissing spines and the presence of ulcers, especially in thoroughbreds, for example. Also there may be other associated problems where osteopathy can have an action. And problems without any link with the horse back which can be treated in a well separated way without forgetting that even discreet links can always exist.

# Equine behavior and kissing spines

The relationship between the osteopath and the horse is extremely important. In the context of horses suffering from the kissing spines syndrome, there are different medical gradients but also different pain bearing gradients for the animal. All animals are not equal regarding pain, its acceptance. Some horses are stoic while others are extremely sensitive to even the slightest pressure of the hand in palpation for example.

Equine osteopathy offers pain relief and rebalances the body through a series of specific actions. But it is nevertheless interesting to know how to observe the pain in a general way. And above all, it is interesting to link the real pain, the apprehension of the pain and the behavior of the horse during treatment. Knowing all the more that for horses suffering from the syndrome of the kissing spines the pain can be real and localized at the level of the back. Pain behavior can also be an apprehension of the human because by linking with the pose of the equipment (the saddle for example), and therefore in connection with the work in which the horse will feel pain. It is important in my opinion to analyze the compensation scheme of the horse. Because the latter appears over time and can be a sign of pain but also bad information from the sensory sensors can be a sign of an apprehension of pain or ghost pain.

The behavior of the horse can thus be synonymous with defiance. It is quite obvious that the pain expressed or the behavior, especially its abrupt change will be part of the story brought by the owner. And this starts with poor performance or reduced performance that can evolve into behavioral problems during work. Many horses will feel disconnected from front to back, or have a short stride gait. Discomfort when grooming or at the slightest pressure on the back. A sudden change in the horse's reaction can be an indicator of back pain. Saddle resistance, increased girth or abnormal gait after being saddled will confirm this. Quite common in the case of kissing spines, the horse tries to bite when the owner tries to put the saddle down... Obviously and again it depends on the horse because some will remain stoic and in this case the approach of the osteopath can be biased by adding bad indications by the owner, especially if the owner acquired the horse late and therefore does not know him very well...

# Post treatment and exercises

Once the passage of the osteopath is made it is interesting to provide advice in terms of daily monitoring by the owner. Obviously you must first find out if the veterinarian surgeon has not requested specific exercises, or if he has not left specific instructions. If so, the prescription from the veterinary surgeon will be at the top of the list in terms of importance. It is also important to collaborate with the team who can provide care and comfort to the horse. Thus check the balance sheet of the farrier, the saddler, the dentist, the nutritionist... I think that the more the osteopath can communicate within the team that surrounds the horse, the more efficiency will be important in the comfort and locomotion of the animal.

Another collaboration can be essential especially concerning the horses which suffer from the syndrome of the kissing spine. This is the coach or riding teacher. He can help the owner to work on his horse according to the different recommendations of the different health professionals.

A work of lunging or even long reining can be put in place. This can help in the musculation of the back of the animal but also in the stretching of the back. In the case of the kissing spine, it is often advisable to work short and frequently on the lunge. This work consists of working on a form of roundness so called in riding. This involves placing the horse upside down in extension and engaging the hind limbs as much as possible. There are also possible aids. I am thinking of the Equibands System mats. Physiological elastic bands cling to the mat. One band will pass at the level of the abdominals and another at the back of the hind limbs. The band at the level of the abdominals will make it possible to lift the back and therefore possibly crush the spinous processes. But also to work the extensor muscles of the back. The band passing behind the hind limbs by pressing without strong restriction on the caudal muscles of the leg will allow the horse to engage, and also to work on the extensor muscles of the back.

Regarding the exercises that can help the horse in terms of pain, proprioception and ridden muscle strengthening, greater collaboration will be requested with the riding instructor to improve or guide the rider according to his abilities. There is a site [physiotec.ca](http://physiotec.ca) which allows, according to the different problems expressed by the horse, to send the owner a large number of exercises aimed at improving the comfort and the locomotion of the animal. These exercises can be carried out on the ground, at the lunge or ridden.

I, personally, attach great importance to the recommended exercises and I think that providing the owner with realistic exercises is synonymous with improving the horse over time. Especially when it comes to horses suffering from kissing spine syndrome.

# Conclusion

It is not easy to find studies demonstrating in a scientific way coherent results concerning the action of manual therapies on the syndrome of kissing spines in horses. Most scientific studies or research show very heterogeneous results. Back pain is a common ailment in animals. While there are medical and surgical treatment options available for select patients, conservative care is the most common form of management of pain, stiffness and muscle spasms. Physical therapists, osteopaths and chiropractors use mobilization and manipulation techniques to evaluate and treat muscle and joint problems in both humans and animals, but there seems to be little scientific evidence available to support their use in veterinary medicine (Haussler,2021).

Nevertheless it is obvious by crossing a maximum of data that: manual therapies including osteopathy in first intention (at least in Europe) brings comfort and help to the locomotion (after treatment by the veterinarian surgeon) to the horse suffering from the kissing spines syndrome. This can be demonstrated with surveys like the one I conducted in partnership with IAAT. But also through other tools such as sensors or thermography that I detail in a chapter above.

Osteopathy had better results with increased nociception. So, all nociception changes indicate that directly or indirectly targeting various anatomical structures can influence biomechanical, neurophysiological, and psychological factors as treatment mediators. Manual therapy may be effective by eliciting an analgesic effect. The results showed that a change in the nociception value could be visible immediately after the first osteopathic treatment session. Osteopathic therapy can be an excellent primary or complementary treatment or prevention for functional disorders in horse backs. It is a non-invasive method that does not require additional medications or equipment, can be easily performed in stables, and positive results can be seen immediately (Vokietyte, 2022).

*The kissing spine syndrome is anatomically irreversible but osteopathic treatments can be put in place to bring comfort to the horse but also to increase its performance through better locomotion. It should also be noted that prevention has a key role in relation to the kissing spine syndrome. It is therefore relevant to consider osteopathic treatments in terms of prevention in the mobility of the horse's back.*

# Sources

The surveys are on panels of 100 people questioned online via different platforms. A majority of respondents live in France (50%), then in Europe (40% Germany, Hungary, United Kingdom, Belgium) and mainly in Australia (10%). The surveys took place between May and August 2022. Regarding health equine professionals, the survey was conducted in partnership with the IAAT.

The online discussion groups are: Horses With Kissing Spine and Equine Biomechanics, Massage & Chiropractic.

The descriptions and anatomical observation come from Muscles FlashCards, Equine In Prime for physiotherapists.

The osteopathy manual therapy techniques come from the London College of Animal Osteopathy lectures, Osteopathy and the Treatment of Horses by Pusey, Guide Pratique d'Ostéopathie Équine by Bouquet and Ostéopathie et Rééducation Équestre by Pradier. (full details in the bibliography below).

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