Animal Osteopathy Manual Therapy

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TOPIC: Effect of Osteopathic Manual Therapy on thoracic spine/vertebral dysfunctions

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QUESTION: Does using Osteopathic Manual Therapy help negate the need for kissing spine surgeries/treatment?

THESIS: Horses having regular Osteopathic Manual Therapy treatment throughout their ridden /working life have a reduced 'risk' of needing invasive treatment for kissing spine.

INTRODUCTION

Kissing Spines is now the most common cause of primary back pain (Jeffcott, 1989). Having said that, Kissing Spines can not only be symptom-free, but it can also be a secondary dysfunction rather than a primary source of pain.

Growing up in the Equine community and becoming a professional within it, the author observed that 'Kissing Spines' wasn't heard of a few decades ago. Horses were typically classified as lame or sound, and it was commonly believed that it would always be a hind or front limb issue. A sore back was often attributed to a badly behaved horse rather than one trying to show discomfort...

Horses have become more of a hobby animal or pet rather than merely for transport/work or for only the elite to enjoy. Riders have come to start being intuitive to issues and raising the question to their vet, instructor, or osteopath as to a back issue rather than a behavioural issue.

As diagnostic and imaging equipment has become more advanced (x-rays and bone scans), dysfunctions can be identified more easily. Horses have also become more expensive and less disposable, so people are wanting to 'treat' the horse rather than 'replace' him; they have also become 'pets' and part of the family.

Treatment, or even surgery for Kissing Spines is becoming more prevalent as it is often covered with insurance and therefore it becomes an option whereas it wouldn't have been previously, so potentially more common within the equine community. The prognosis for horses following treatment is also more positive, so the more horses receive surgery or treatment and so the cycle continues.

Kissing spine surgery currently costs £1700 - £2000 plus VAT for the less invasive Interspinous Ligament Desmotomy Surgery and £1200 - £1500 plus VAT (this price is based on the last procedure they did) for removing part of the spinous processes themselves – prices are dependent and on the number of vertebrae involved and are only for the surgery itself and don't include, livery and aftercare at the clinic or any additional costs or complications which may be incurred (Donnington Grove, 2023).

WHAT IS KISSING SPINE SYNDROME?

Biomechanics

The spine is made up of 7 cervical vertebrae (C1-7), 18 thoracic vertebrae (T1-18), 6 Lumbar vertebrae (L1-6), and 15-21 Coccygeal vertebrae. Each vertebra in the spine has a Dorsal Spinous Process (DSP) which arises from the body of the vertebra and points upwards, these range in height from 2-3 inches up to 9 inches depending on the area of the spine. In the healthy spine, it is thought that there should be approximately 3-6 millimetres between the tops (summit) of these DSPs. This gap is filled with a strong interspinous ligament. There is also an additional ligament that runs along the summit of the DSPs called the supraspinatus ligament.

The basic movements of the equine spine are 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) (Rene van Weeren, 2004).

Kissing Spines is Overriding or impinging Dorsal Spinous Processes (ORDSP) that occur when vertebrae in the spine are too close together rather than being spaced apart as in a healthy spine. This results in touching or overlapping of two or more of the DSP. Kissing Spines most commonly occurs between thoracic vertebrae T13 and T18 with T15 the most often affected – this is the site where the orientation of the spinous process changes orientation and where the rider sits (McGregor & Pechek, 2023). Kissing spines have also been noted to manifest in the cervical and lumbar vertebrae; however, occurrences of such instances are comparatively infrequent (Author's observation).

If musculoskeletal tissues become dysfunctional as a result of trauma, the result and function of the tissues will change. This causes compression of surrounding structures including blood vessels which can result in poor nutrition of surrounding tissues, poor waste removal, and ultimately the onset of disease.

Causes Of Kissing Spines

It is widely thought that Kissing Spines is more common in thoroughbreds and warmbloods – is this because Thoroughbreds are brought into work at an early age before their musculoskeletal systems are fully developed and matured?

It is not only racing Thoroughbreds that are brought into work too early. Many Warmbloods, Sports, and Performance horses are also not allowed to grow and mature before they are brought into work and are expected to be ridden in a way that their musculature isn't mature enough for. This can not only lead to primary dysfunctions involving the spinous processes as it is not strong enough to withstand the 'engagement' of the posture the horse is being asked

to maintain, but it is also potentially putting strain elsewhere on the body for example tendons and hocks, and thus leading to dysfunctions elsewhere and causing referred pain and disease. This then forces the horse to guard against the discomfort or pain thus creating a change in the horse's posture which will then lead to the secondary dysfunction of 'Kissing Spines'.

Throughout the equine community, consensus dictates that horses should not be ridden in a 'hollow' manner without engaging their core as the horse must have this engagement to stabilise the musculoskeletal system and Multifidus muscles activated. However, if this was the case, every 'first ridden', every novice horse or pony in a riding school, and every horse that is ridden western style would be predisposed to Kissing Spines due to lack of core stability!

There is also, historical documentation stating that Kissing Spines has been observed before the modern ways of riding and saddling: In the 11th and 12 centuries, 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" (Makowiecki, 2022).

Modern breeding can also be a factor, breeding from a 'favourite mare' rather than conformation i.e., long back/bad posture, etc., will continue to 'skew' any data analysis unless breeding is controlled.

Horses have evolved to build, develop, and maintain their core muscles and stability over their backs so that they can survive in the wild. Only when an external factor such as an ill-fitting saddle, unbalanced rider, trauma, or a dysfunction elsewhere in the horse's body,

including an infection from a tooth or an unbalanced hoof, may then cause the cycle of events that cause disease in the horse's body which the horse cannot heal.

Kissing Spines can often be a secondary dysfunction to hind limb lameness, hock injuries, etc. or it can be a result of guarding and compensating for a primary dysfunction elsewhere, resulting in poor posture which in turn reduces the stability of the core and weakens the muscle structures through the back, reducing the flexibility and range of movement. This is also one of the reasons back pain is seen as a problem in rested horses who have lost this muscle mass. The first choice of treatment is an exercise program that builds up the correct muscular support (McGregor & Pechek, 2023).

The Role of the Rider

> “Competent equitation is the horse’s best therapy!” (Jean Luc Cornille 2011)
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> "I dream my painting and then I paint my dream." (Vincent van Gogh, 1853-1890) As well, the horse's education and nevertheless the horse's re-education, demands a sound vision of the horse's locomotor apparatus (I dream my painting) and an equitation refined to the subtlety of the horse's biological mechanism, (and then I paint my dream). Everyone wants a gymnastic exercise or postural alignment that would fix the problem. Event pretenders are selling miraculous postures or rein effects. The reality is that there is not any movement having any specific effect as long as the rider does not have a sound understanding of the horse's biological mechanism. For example, lateral bending of the horse's thoracolumbar spine demands knowledge and a sound understanding of the interactions between lateral bending and transversal rotations. (Jean Luc Cornille 2011)

"The claim 'Competent equitation is the horse's best therapy!' (Jean Luc Cornille, 2011) brings to mind a deep connection between equine well-being and effective horsemanship. This outlook resonates with Vincent van Gogh's artistic philosophy: 'I dream my painting and then I paint my dream' (1853-1890). In this light, the principle 'The body can only self-heal if it isn't already so dysfunctional that it is already diseased beyond repair – the dream can only be painted if the memory of the dream remains…' assumes a similar significance. The prospect of healing, like competent equitation, hinges upon an innate harmony within the subject—be it the horse's body itself or the artistic vision.

As Jean Luc Cornille suggests, there exists a notable prevalence of both amateur and even professional riders and owners independently engaging with their horses, often in the absence of readily available knowledgeable advice, while attempting to imitate their idols from afar.

This can result in young horses developing the wrong muscle patterns as they are backed and initiated into their working careers. As a result, they may appear to resemble the top competition horses in appearance but lack spinal mobility and core stabilization. These horses may have never been taught how to engage their hindquarters, as they have only experienced excessive pressure on their reins from overly strong bits, overly tight rein control, or the use of gadgets that promise great results. As a result of well-intentioned yet often misinformed practices, these horses remain weaker and less stable in the Multifidus muscle group and Longissimus Dorsi muscles.

Given these factors, riders may find it easier to 'hold the horse' in to make it look pretty without developing the muscles to support the back and the hind limb. Then it is only a matter of time until the weak multifidus muscles become too weak to support the Thoracic spine in its healthy posture. Add to this, a lack of knowledge as to how and how long to correctly warm up and cool down a horse and the number of injuries due to lack of warm-up, etc., which can then lead to the secondary issue of Kissing Spines.

"In cases where we're talking about the normal flexibility of the spine occasionally resulting in the edges of the bones 'kissing', it is easy to see how increased muscle tone as a result of physiotherapy and a change in work, might prevent this." (Bladon, 2023).

Symptoms, Diagnosis, and Treatment

Symptoms of Kissing Spines:

There can be many on none at all. Kissing Spines does not always present problems or clinical symptoms:

Poor or reduced performance

Occasionally low-grade hind limb lameness

Some horses can have consistent, low-grade pain.

Irritability when grooming

Behavioural issues

Issues when tacking up or girthing.

Muscle spasms

Tripping/stumbling

(McGregor & Pechek, 2023).

Horses are very stoic animals, and most will try not to show discomfort or pain until they have to so they will put up with having their girth done up, they will put their ears back, they will hump slightly rather than buck you off until the discomfort or pain is unbearable, and their discomfort needs to be taken seriously. If the horse is in discomfort or pain he may change his posture to guard against the discomfort, compensating to try and alleviate the discomfort and therefore 'load' some limbs and muscles more than others, eventually over-

emphasising the change in the posture and also the dysfunction of the spinous processes, to minimise his discomfort.

The tricky aspect of diagnosing kissing spines is that researchers have shown that 39% of horses have changes on their back X-rays consistent with kissing spines, yet they show no signs of back pain. Similarly, the angle from which the veterinarian takes the X-rays can influence the apparent spacing between processes and might result in overdiagnosis (Hill, 2023).

Diagnosing Kissing Spines can be very difficult as the horse may be anything from asymptomatic to showing a range of symptoms (Hill 2003), many of which are behavioural and/or subtle in changes within the gait or refusing to pick up the correct canter lead etc. and sometimes the 'one-horse owner' will be the best person to pick up these anomalies as they are in tune with the horse that they ride and handle.

Diagnosis starts with palpation, several tests in hand and under saddle, and on various surfaces, all depending on what the presenting symptoms are. X-rays can then confirm a diagnosis of Kissing Spines, along with History and Clinical signs, and often ultrasound is the next stage as this will then give additional information about the bone surface, the tissues attached to the bones, and surrounding them. The epaxial muscles and their levels of atrophy or irritation in their tendon attachments to the Dorsal Spinous Processes can all be seen in an ultrasound which can then also show joint issues in the spine which could also be causing back pain.

X-rays may show extreme forms of Kissing Spines where the bones have begun to fuse and little to no motion remains – this is called Ankylosis (Bernstein, 2020).

Treatments:

Muscle relaxants

Chiropractic

Acupuncture

Shockwave

Mesotherapy

Laser (newer Class IV Lasers working with better penetration)

Corticosteroid injections – and newer drugs such as Tildren/Osphos (bisphosphonates)

Surgery – either cutting the ligament that runs between each affected spinous process to allow more space between them or removing part of the spinous process to create more space.

(Coumbe, 2023).

Most horses diagnosed with kissing spines can return to ridden work after appropriate veterinary treatment and a recommended rehab program is completed. In some cases, they may be unable to return to the same level of work as before but are comfortable when working at a lower level. Research from a 2019 study of 71 cases dating from 2012 to 2017 undertaken in the US found 91.1% of horses successfully returned to work after Interspinous Ligament Desmotomy surgery, with 52.9% returning to the same or a higher level of performance than before surgery (Prisk/Garcia-Lopez 2019).

The Role of Osteopathy

> Pain sensation is an obvious effect of injury but is difficult to quantify in animals. Due to the nature and origin of the horse, the primary interest of the horse is to make adjustments and carry on moving. The horse's ability to compensate is recognised as important. Although there may be acute pain in one region, there will often be other areas of long-standing dysfunction, apparent on observation and palpation, which the horse has coped by making adjustments to the way it moves. (Pusey, 2007)

The Osteopath seeks to restore the structure and function of the primary dysfunctional tissues before the dysfunction has caused poor nutrition etc and disease and ultimately the secondary dysfunction of Kissing Spines.

By actively addressing primary dysfunctional issues before they lead to complications such as poor nutrition and disease, Osteopaths work to pre-empt the potential development of secondary dysfunctions like Kissing Spines. This proactive approach highlights the significance of early intervention in maintaining equine health. However, recognising that the body's ability to self-heal is contingent on its overall functionality, it becomes apparent that the concept of self-healing thrives most effectively when the body remains within a state of viable function.

Osteopathy and Self-Healing

> The Osteopathic philosophy focuses on the interrelationship and unity of structure (anatomy) and function (physiology). (Chila, 2011)

Despite the various treatments available, surely for the sake of horse welfare and owners' time and finances the answer is to prevent the Kissing Spines diagnosis, rather than treat it.

The Rule of Artery is Supreme – Tenet 4

The Body can heal itself and maintain homeostasis. Homeostasis can only be maintained if the body is healthy enough to heal itself (McGregor & Pechek, 2023). If dysfunction is left untreated, the body will compensate for the loss of function, and other systems – circulatory, digestive, and lymphatic nervous systems - will have to work harder to compensate for that loss of function, which will lead to the onset of disease rather than homeostasis. With the input of an osteopath, whose goal is to Restore Function, the body can return to its optimal state of health.

So, from the time he is bought (or bred), it is surely more cost-effective (and less stressful) to keep him healthy; The horse can self-heal as long as he is kept in a healthy enough state that he can restore his own body so, with regular treatment from the osteopath, the horse can be kept healthy and the osteopath can help the horse with any dysfunctions he may find on regular visits. As these visits are regular, these dysfunctions should be primary and very easy to remedy.

Osteopathic treatments can positively impact the nervous, circulatory, and lymphatic systems, to improve body function and overall health. Some osteopathic techniques may enhance lymphatic health and bring about internal improvements in the body without needing invasive surgical treatment. (Felman, 2017)

How Osteopathy May Prevent Invasive Treatment

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).

As Pusey (2007) suggests, through early-stage Osteopathic Manual Therapy treatment, the horse's entire body can be nurtured and aligned, enabling the horse to naturally regain a healthy balance. This approach may aid the horse in self-correction at the earliest indication of any dysfunction.

There are two primary goals in the short- and long-term treatment of Kissing Spines and any primary back problems: increase the back musculature and reduce pain. By increasing the musculature along the back, or top line, there is increased support for the underlying bony structures (Contino 2020).

Quote from Animal Osteopathy Worldwide (FB) “A happy back leads to a happy horse, and a happy horse is a high-performing horse! By addressing the back pain through osteopathy, we not only ensure your equine companion’s comfort, but we’re also helping them reach their full potential in various equestrian activities, from dressage to show jumping to reining to trail riding.” LCAO

By regularly having the musculoskeletal system articulated through its full range of motion (ROM), we are not only ensuring that the joints and muscles are moving correctly and being maintained but are also ensuring correct flow of fluids throughout the body (McGregor & Pechek, 2023).

The assertion made by McGregor and Pechek in 2023, highlighting the significance of regularly ensuring the full articulation of the musculoskeletal system through its entire range of motion (ROM), supports the argument that osteopathic therapy may enhance the outcomes of Kissing Spines in horses. This is because such therapy not only fosters proper joint and muscle movement and maintenance but also the appropriate circulation of bodily fluids, which can play a pivotal role in addressing this condition.

We are also ensuring that as the horse progresses in his training and/or growth, his limbs, muscles, ligaments, etc. all form correctly as the body will be circulating fluids and nutrients at optimum levels. With regular OMT, the practitioner can get to know the ‘norm’ for that particular horse – what their particular fascia feels like, what the tension of their muscle is normally like, and any Somatic Dysfunction.

Assessing "Tissue texture change Asymmetry Restriction Tenderness (T.A.R.T.) (Chila, 2011)" in a specific animal, serves as an early warning system, enabling the identification of minor dysfunctions well in advance. This proactive approach helps address issues before they escalate into significant problems or develop into more serious conditions. Osteopathic treatment also encourages the use of stretching to achieve general and specific mobilisation of the spine and other joints of the body, detoxification, and strengthening of the immune system.

In the absence of continuous osteopathic care, one would find themselves in a state of anticipation for unforeseen ailments, often with multiple symptoms and many differential diagnoses, it becomes challenging to pinpoint specific issues. Consequently, such an indefinite scenario requires potentially multiple, expensive veterinary interventions. These visits, along with their consequent expenses, include the processes of diagnosis, consideration

of treatment alternatives, assessment of prognosis, potential surgical interventions, periods of convalescence, and the persistent outlays associated with ongoing rehabilitation efforts.

Ideally a *team* of people working from the start of the horse's life or at least 'working' life to ensure that the owner/rider has the support around him or her to ensure that the horse gets the correct trimming and/or shoeing to ensure the feet are balanced; the correct tack to ensure it is appropriate and is correctly fitted; is ridden and lunged in such a way that the muscles are developed in the correct way, ground work and pole work is essential for balancing and strengthening the muscle chains, maintaining and improving posture and core stability, increasing rotation through the back and improving musculoskeletal health and performance; a well-balanced diet to not only ensure that he is getting the nutrition he needs but that he is not carrying too much or too little weight; and correct and regular dental care to ensure that the teeth and gums are healthy, correctly aligned, with no sharp edges and that any bits used are able to sit comfortably in the mouth (McGregor & Pechek, 2023).

The Limitations of Osteopathy

There are other circumstances where no amount of Osteopathic Manual Therapy would prevent issues arising – birth defects, either from malnutrition, other neonatal issues or genetics (Christa Lesté-Lasserre 2022), ill-fitting tack and overweight or unbalanced riders - polo, polo cross, horse ball, and barrel racing are examples where the rider is leaning off to the sagittal plane of the horse, (and taking their body weight with them) rather than being 'unbalanced' to the median plane of the horse as is the 'amateur/unbalanced' rider.

Conclusion

While writing this thesis, the author reached out to Donnington Grove Equine Veterinary Hospital to obtain insights into their current pricing structure (aforementioned in the 'Introduction'). This inquiry revealed that the hospital continues to offer less invasive Interspinous Ligament Desmotomy (ILDS) procedures. However, it was noted that there is a lack of specific pricing information available for the more intrusive surgical option involving the removal, or partial removal, of spinous processes. This observation prompted an intriguing question that has underpinned the academic and practical question: Could this absence of a set price range for the more invasive surgeries demonstrate a growing emphasis on a holistic approach within the equine medical community? This inquiry underscores the need for a comprehensive examination of evolving perspectives on equine treatment methods (and their corresponding financial considerations!).

Without Osteopathic Manual Therapy, small issues – an irritated muscle or nerve - leading to a minor dysfunction and the horse compensating and loading elsewhere can escalate into the

horse having a reduced range of motion and not being *able* to extend his spine and this long-term may cause Kissing Spines.

The horse serves dual roles as a leisure companion and a performance animal, allowing for varying levels of expertise and knowledge regarding equine management and certainly biomechanics, amongst the enthusiasts. The importance of a competent and knowledgeable support system for horse owners and riders is underscored throughout this paper by both the author and various experts in the equitation and osteopathic fields. This support system is crucial to prevent minor dysfunctions from escalating into more significant issues, which may arise when individuals inadvertently exacerbate equine health problems through well-intentioned but uninformed care practices. Such situations include overfeeding horses, neglecting changes in posture, and misinterpreting behavioural cues, ultimately requiring the need for informed supervision and care.

Keep the spine mobile!

Equine physiotherapist Gillian Tabor recently quoted in H&H;

> "If you allow the horse's posture to return to something that isn't optimal for carrying a rider, the pain will return. We've got to do all we can to help lift the back and get the horse strong enough to maintain a lifted spine with spaces between the spinous processes" (Tabor 2023).

Her quote was actually about Kissing Spines *surgery* but emphasised the need for ongoing rehabilitation to strengthen the back and keep it strong. Rehabilitation isn't a case of 'ticking the box' to say it is 'job done' it is a life-long commitment to keep the spine lifted between those spinous processes! Rehabilitating a horse with Kissing Spines, or preferably preventing

a horse from developing Kissing Spines in the first place, is achievable through maintaining spinal mobility, engaging in pole work, performing stretches, and, when permissible, incorporating exercises post-surgery. A horse that is rehabilitated and then goes back to a sedentary life is more likely to have a reoccurrence of the same or other back pain due to weakness of the back muscles and core structures and then if he is not brought back into work slowly and correctly, a sore back is going to be an issue again regardless of the approach of treatment.

Kissing Spines encompasses numerous factors within the prevention, diagnosis, treatment, and rehabilitation phases. Osteopathy can play a pivotal role in these processes by facilitating regular visits, monitoring, providing support, and offering advice, particularly for equestrians of varying experience levels. Moreover, osteopaths may refer riders to other professionals as needed, all while assisting the horse's natural healing processes. While some riders, including amateurs, might inadvertently contribute to certain predisposing factors such as overfeeding or inadequate exercise, a well-trained osteopath can often mitigate these aspects that potentially contribute to the prevention of Kissing Spines.

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