

'Kissing spines' in the thoroughbred racehorse

'Kissing spines' is the commonly used term for a painful back condition called 'impinging dorsal spinous processes'. The dorsal spinous processes (DSPs or 'spines'), are the tall blades of bones which point upwards from each vertebra of the back. The DSPs are part of the skeleton which forms the horse's withers, back and loins and are therefore fundamental in supporting the weight and position of the rider and saddle. Important muscles and ligaments surround the DSPs and provide the strength and mobility required for the horse to carry the rider and use its back effectively during exercise.

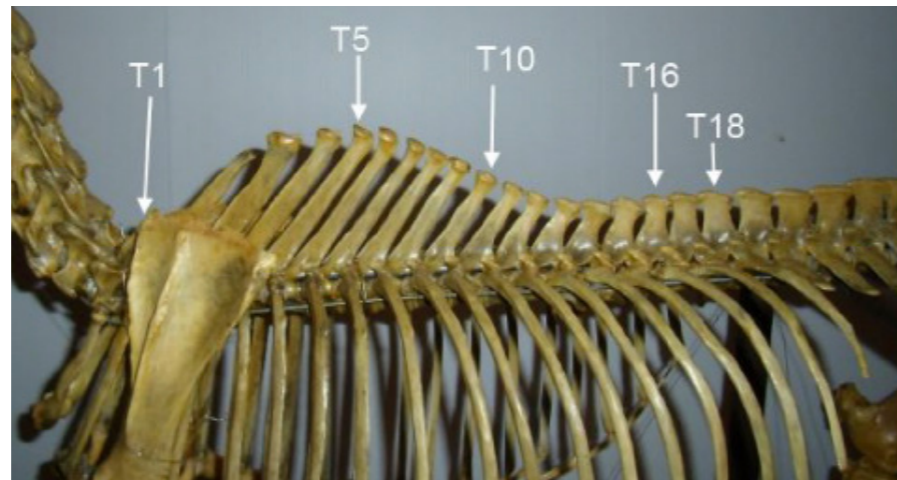
When we x-ray a normal horse we expect to see a healthy space, or gap, between each DSP which allows the back to move freely during exercise. However, it is not uncommon to find little or sometimes even no space between the DSPs, causing them to touch and sometimes eventually fuse together over time. What causes this change is still widely debated, but it is not seen in foals and therefore is assumed to develop with age and/or ridden exercise.

We have learnt over time that determining whether a horse has pain arising from 'kissing spines' is not as simple as x-raying the back to give a black or white answer. Some horses display signs of back pain but have a very normal appearance on x-ray, and conversely some horses with evidence of kissing spines on x-ray can seemingly show no evidence of back pain or poor performance at all. Clearly the condition is more complicated than it would first seem, so here is a summary of our current understanding at this time.

Anatomy of the equine back

Horses usually have 54 vertebrae (back bones), which extend from the poll to the tip of the dock. They are categorised into the following regions:

- the neck contains 7 'cervical' vertebrae (called C1-C7)
- the thoracic region (the 'upper' back where there are ribs attached to the spine) has 18 vertebrae (T1-T18)
- the lumbar region ('lower back'/loin) has 6 vertebrae (L1-L6)



A skeleton of the thoroughbred back with vertebrae labelled

- the sacrum, which forms the rump of the horse, consists of 5 vertebrae which are usually fused together (S1-S5)
- the tail consists of 18 'coccygeal' vertebrae (Co1-Co18)

It should be noted that breed variation can result in additional or missing vertebrae!

The DSPs sit at the top and in the middle of each vertebra and point upwards. They vary in size depending on location along the spine, with the tallest DSPs forming the withers and the shortest located in the mid-thoracic region (where the saddle sits).

So why do some horses get kissing spines?

Some horses may be predisposed to suffering from kissing spines due to conformation and other genetics, while others seem to develop it whilst in training. It has been suggested that poor riding, a rider who is too heavy for the horse and saddle fit, may all play a part in development of the condition.

It is not uncommon for horses with lameness or poor performance issues to be found to have back pain when examined clinically. Of these, only around two-thirds have x-rays showing kissing spines. And even more confusing, of the horses that do not show any signs of back pain, over a third of them have evidence

of kissing spines on x-ray. So what do we make of this? Clearly we cannot rely on either of these findings in isolation to definitively diagnose kissing spines as the cause of back pain or poor performance in a horse.

The most common sites to see kissing spines on x-ray are the lower thoracic vertebrae. This is the area where the saddle transfers a majority of the rider's weight to the horse's back in walk and trot. The DSPs in this area are also the most vertical, whereas those in front of this area are naturally angled back, and those behind are angled slightly forward.

Diagnosing kissing spines

Back pain can be quite difficult to diagnose reliably, as mentioned above. The horse's response to palpation can vary from hour to hour and day to day. It is also difficult to localise the exact point of pain because the back is such a large, complex structure in the horse. It is fairly common for a trainer or rider to complain that the horse's behaviour has changed or is affecting its performance, sometimes noting the horse to be 'cold-backed', bucking, rearing or reluctant to go forward at times (e.g. 'jibbing' at the bottom of the canter).

Affected horses sometimes carry their head in an awkward fashion, they may feel 'wooden' or tense and unresponsive to the rider's attempts to alter these things. These horses often

have poor musculature along the back due to the pain and abnormal use of the muscles preventing normal building up of the musculature. This can eventually lead to poor muscling elsewhere in the body and therefore, unsurprisingly, poor performance overall.

These symptoms are sometimes recognised early on by trainers, riders, staff, vets or physiotherapists, however it is not uncommon for these horses to be branded as difficult rides, tricky characters, lazy or nappy, without consideration of a painful cause for these behaviours.

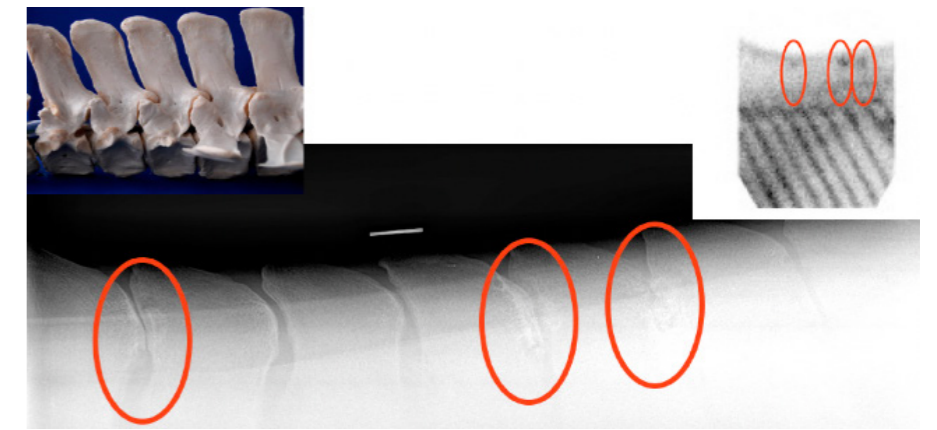
Where kissing spines may be suspected after a thorough consideration of the history and a clinical examination, it is common to then take x-rays of the back to assess the position of the DSPs in relation to each other. X-rays alone are not sufficient to diagnose kissing spines however, as studies have shown there is a poor correlation between pain and what we see on x-rays.

It has been shown that anything in the region of two-thirds of thoroughbreds may have changes on x-ray yet not all of those will be in pain or suffering poor performance as a result. This realisation led to the Federation of European Equine Veterinary Associations (FEEVA) to release the following position statement in 2018, which advises against using x-rays as part of a 'vetting' examination in order to assess a horse's risk of developing back pain due to kissing spines:

FEEVA considers that there is no evidence of a correlation between radiographic appearance of the dorsal spinous processes of the back and future risk of disease in asymptomatic horses; FEEVA does not recommend that such radiography is included in a standard pre-purchase radiographic protocol.

X-rays can be useful if there are changes observed which correspond to an area deemed painful on clinical examination, but further information is still often required to build evidence for a diagnosis. Carrying out diagnostic analgesia, or 'nerve blocking', of the area where kissing spines have been seen on x-ray, is a further step in trying to confirm whether the site is responsible for any pain.

If the horse responds to having the region 'blocked' then this may indicate a need for yet further imaging or perhaps trial medication. Ultrasound can be used to assess the soft tissues surrounding the kissing spines, whereas nuclear scintigraphy ('bone scan') can assess how much the condition is affecting the bone of the DSPs themselves. Treatment can



Anatomy and what the different imaging modalities show

then be tailored to that individual in order to try to achieve the best outcome.

Treatment and management of kissing spines

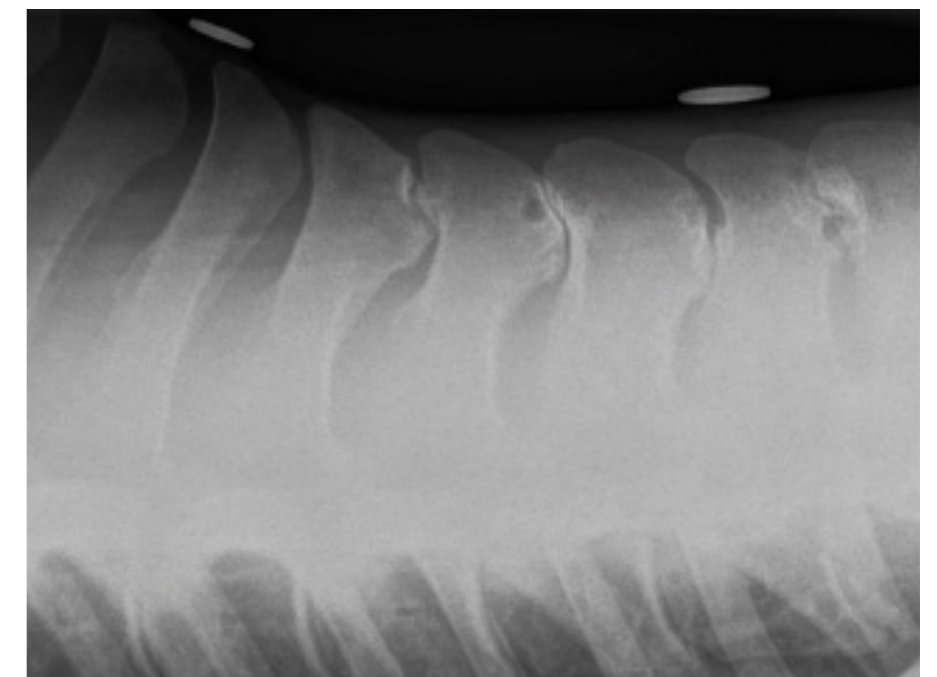
The success of treatment relies on a holistic approach that may involve addressing any lameness (even very low-grade lameness), the horse's tack, the rider and way it is ridden, the way it is trained, involvement of a qualified physiotherapist, etc. Treating only one of what may be multiple contributing issues is likely to result in a poor response and is therefore potentially a waste of time and money.

There are different treatment options available for this condition and each case will require a tailored approach:

Conservative management: rest, followed by a progressive rehabilitation

programme, usually requiring a change in tack/rider/training. This usually requires significant time and therefore is often used in conjunction with other treatment options below.

- **Oral medications:** anti-inflammatories and pain-relieving medications, such as phenylbutazone ('bute'), can help in some cases. Sometimes muscle relaxants are also prescribed.
- **Injectable medications:** injecting the painful region with anti-inflammatories, such as corticosteroids, often yields a successful but short-lived response. If the appropriate changes to management, riding and training are not implemented effectively the pain frequently recurs. Medication such as this should be viewed not as a treatment in isolation, but more as creating a window of opportunity whereby the horse is in less (or no) >>

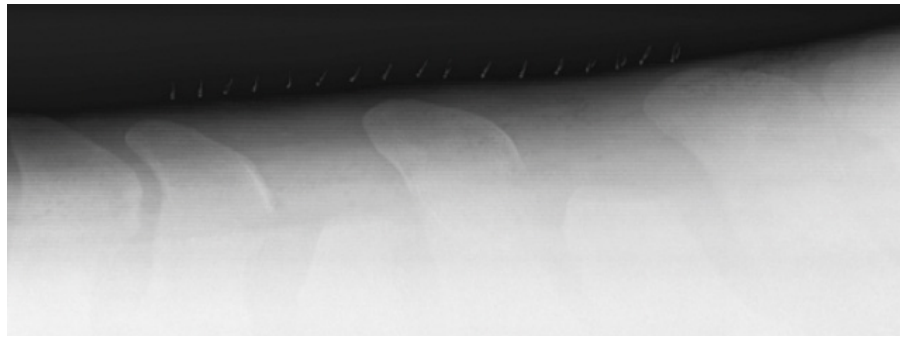


Severe 'kissing spines' on x-ray and 'hot spots' on bone scan

» pain, which then allows the other management, ridden and training changes to be implemented. Treatment may need to be repeated in order to see the rehabilitation/retraining programme through, but persistently repeated medications should not be relied upon in isolation, otherwise the condition will progress regardless and may reach a point of no return. It must be noted that some corticosteroid medications have a prolonged detection time for racing and competition.

- **Extracorporeal shockwave therapy:** this therapy seems to offer temporary pain relief in some cases but, again, will not provide treatment in isolation.
- **Mesotherapy, acupuncture, chiropractic and other musculoskeletal therapies:** these are anecdotally reported to have variable success.
- **Surgical resection (removal) of the affected DSPs:** while this can be a successful treatment option it requires a significant time out of training. This can often be performed in the standing, sedated horse which removes the need for general anaesthetic but does not reduce the rehabilitation time required.
- **Surgical cutting of the ligaments between the DSPs (interspinous ligament desmotomy):** this increases the space between the DSPs and is believed to relieve the pressure, tension and so hopefully the pain associated with kissing spines. This option requires less time out of training than a full resection but still a significant period.

Perhaps the most forgotten aspect of managing (or perhaps even preventing)



X-ray of a back after having surgery to remove the DSPs which were 'kissing'

a horse with kissing spines is the way the horse works and carries himself. The pure biomechanics of the horse's back at rest and exercise should be addressed in order to protect back pain from recurring or indeed occurring in the first place. In order to avoid back pain from the outset, close attention should be paid to rider and tack. Physiotherapy can help manage horses through training and certainly throughout treatment and rehabilitation, but prevention is always better than cure.

The more skilled, balanced and sympathetic the rider, contacting the horse through well-fitted tack, the better chance the horse has of avoiding painful back conditions and, where they occur, being rehabilitated to work in a way that goes on to protect it from further injury.

Conclusion

Where back pain is suspected in a horse, it is important to not assume that a definitive diagnosis can be reached easily – the process is often more complicated than many would prefer to believe, and opinion varies widely, which brings a need for caution when interpreting findings.

A single treatment will rarely, if ever, 'cure' or 'fix' the problem. The

issue presenting as 'back pain' is often multifactorial and therefore requires a multi-pronged approach, otherwise treatment is likely to be temporary or may simply fail altogether. X-rays alone are not enough to confirm kissing spines as the sole cause of back pain, although they are an important part of the armoury in assessing these horses when the information gained is used appropriately.

With these horses there must be a relatively long-term commitment to reaching a successful outcome and shortcuts are unlikely to be beneficial.

The effect of a good rider and well-fitting tack should never be underestimated in preventing and treating back pain. It is important to consider these factors and address them early on in order to keep horses comfortable, working correctly and achieving their maximum performance potential.

Images courtesy of Sarah Boys Smith, Rosssdales Diagnostic Centre, Newmarket

References

Denoix JM, Dyson SJ. Thoracolumbar spine. In: Diagnosis and management of lameness in the horse (2nd edition). Ross MW, Dyson S