The increased fetlock joint extension and ligament loading of movements such as piaffe and canter pirouette account for the increased vulnerability of dressage horses to PSD

Suspension trouble

Suspensory desmitis is a condition often seen in sport horses, dressage horses in particular. *Matt Smith MRCVS* explains how the causes, severity, treatment and prognoses vary

CHRONIC proximal suspensory desmitis (PSD) is an all-too-common cause of lameness in horses from a range of disciplines. Horses typically present with low-grade to moderate bilateral (both legs) hindlimb lameness, but lameness may be unilateral (affecting only one leg). PSD usually occurs in the hindlimbs, but forelimbs are still affected reasonably often.

The lameness may be subtle and horses presented because of ridden performance complaints, such as a lack of impulsion, struggling at canter or switching lead limb, or more general signs of discomfort in work. Lameness is often more apparent when the horse is lunged, and usually is worse on the outside limb. Sometimes it is more obvious during a ridden examination.

The condition is particularly common in dressage horses, because of the strain placed on the suspensory apparatus by the work asked for in that discipline (see box, overleaf). But it is seen in horses from all disciplines and is often identified in recreational sports horses. Examination of the limb is often unremarkable – external swelling or heat is uncommon because the affected part of the ligament sits deep beneath the flexor tendons

"Horses may present with ridden performance complaints"

and between the splint bones and cannon bone. Some horses may react to squeezing around the upper cannon region, and flexion tests may exacerbate lameness.

With an acute (severe and sudden-onset) injury to the origin of the suspensory ligament, lameness is the main feature and is usually moderate or severe. Swelling may be seen despite the depth of the injured ligament.

Suspensory branch desmitis more commonly occurs as an acute injury, but can also be seen as an ongoing, chronic condition in which multiple branches in more than one limb may be involved. If the injury is acute, the horse presents with sudden-onset lameness, and it is usually moderately severe initially. Heat and pain are often evident when the injured branch is palpated.

In horses with chronic desmitis, the onset of lameness has often been insidious – gradual, but damaging nonetheless – and the affected branches are usually thickened with a build-up of scar tissue around the ligament. This may indicate a degenerative condition, and other signs of suspensory ligament failure such as over-extension of the affected fetlock, or fetlocks, may be seen.

Right: degenerative suspensory desmitis is typically seen in horses with straight hocks and over-extending fetlocks

Pictures by Azahara Perez/Alamy, Zoonar GmbH/Alamy and Matt Smith

PINPOINTING THE PROBLEM

CHRONIC proximal suspensory desmitis usually requires a combination of nerve blocks, X-rays and ultrasound to diagnose as a cause of lameness. When investigating lameness with nerve blocks, horses are examined trotting in-hand, on the lunge, and sometimes ridden, before and after nerve blocks to determine the source of pain and lameness.

A horse with proximal suspensory desmitis will not improve with nerve blocks of the lower limb, but when the suspensory ligament origin is "blocked" an improvement is seen. There are a few different nerve blocks that will desensitise the suspensory ligament, but blocking the deep branch of the lateral plantar nerve (in hindlimbs) is most commonly performed.

Once lameness has been localised to the upper cannon region, X-rays and ultrasound are used. Often little or no abnormalities are seen on X-ray, and ultrasound is most useful to identify ligament damage and determine severity.

There is some variation in the normal ultrasound appearance of the suspensory ligament origin, due to variable amounts of fat and muscular tissue, and care is needed not to misinterpret this as an injury. In a small number of cases, more advanced imaging with MRI is necessary to make a diagnosis. Examination of both legs should always be performed, as bilateral disease is common.

Acute injuries, particularly of the suspensory ligament branches, can usually be diagnosed from careful clinical examination. The injury is then better defined by ultrasound examination. X-rays are usually taken to determine if there is concurrent injury to the bone where the ligament attaches.

HEALING POSSIBILITIES

THE best treatment for suspensory desmitis depends on the cause of the injury – is it acute or chronic – its location and, more specifically, the type and severity of the injury. Ideally, treatment promotes healing of the injured ligament.

- Surgery may provide the optimum chance of healing for some specific types of injury. For example, healing of acute tears of the suspensory ligament branches can be helped by surgical debridement (cleaning and removal of damaged tissue) of torn fibres and the removal of small fragments of bone pulled off the sesamoid attachments.
- Shock-wave therapy is of most use for treatment of injuries at the bone-ligament interface, and is used for treatment of both proximal suspensory desmitis and suspensory branch desmitis. The shock waves are targeted to the injured site and release energy that stimulates cellular and growth factor responses, which in turn aids healing.
- Regenerative treatments are best used by implantation into well-defined "core lesions" (a hole in the centre of a tendon or ligament where fibres have been

Ultrasound is more reliable than X-ray as a method of imaging and identifying ligament damage to determine the severity of an injury

THE VET

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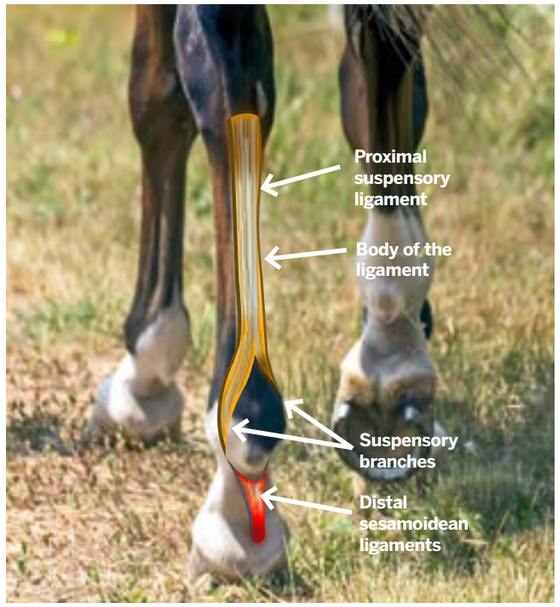
The anatomy

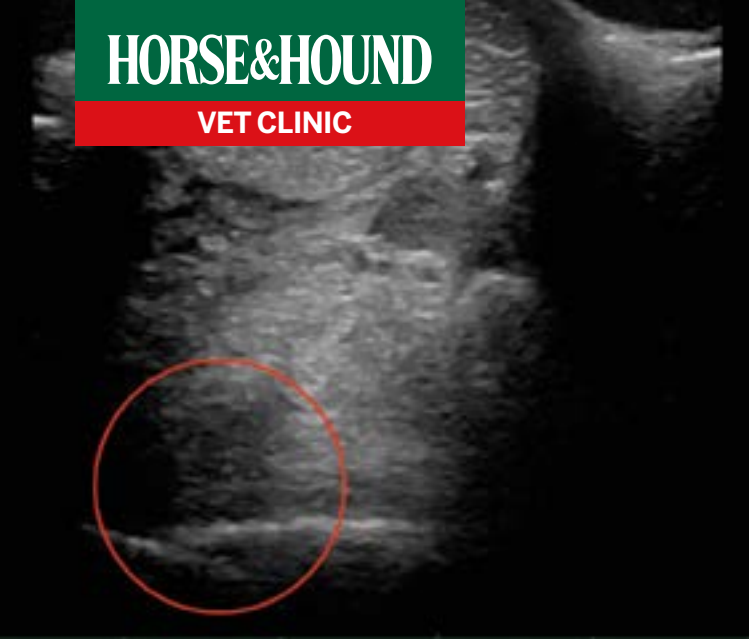
THE suspensory ligament is a strong band of tissue that supports a horse's fetlock joints. It extends from the back of the upper cannon and knee (in forelimbs) or hock (in hindlimbs), to its attachments to the sesamoid bones at the level of the fetlock.

In the lower cannon region, it divides into inside and outside branches, which attach to the sesamoid bones. The distal sesamoidean ligaments then extend as a functional continuation of the suspensory ligament, from the sesamoids to the pastern.

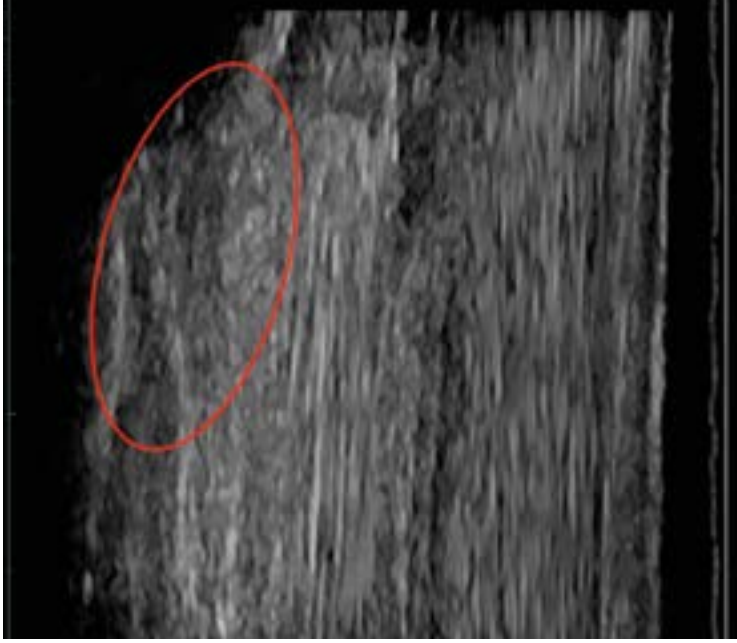
The suspensory ligament can be injured anywhere along its length: the origin (proximal suspensory desmitis), the body of the ligament, or the branches (suspensory branch desmitis).



The suspensory ligament runs along the back of the cannon bones



This transverse scan of a proximal suspensory injury shows the area of damage – the darker patch is the injured part of the ligament



On this longitudinal scan the normal long fibre pattern of the ligament can be seen lower down the leg, but not within the circle

damaged and there has been bleeding and fluid accumulation). This enables them to be better targeted, and for the injured tissue to retain the benefit of the treatment more effectively. Platelet-rich plasma, BMAC (bone marrow aspirate concentrate) and stem cells are all options. They act to promote healing by stimulating formation of new tendon or ligament tissue.

- Neurectomy (a type of nerve block involving the severing and removal of a nerve) of the deep branch of the lateral plantar nerve and fasciotomy (in which the fascia – connective tissue – is cut) is an alternative treatment for chronic hindlimb proximal suspensory desmitis. The aim of surgery is twofold – to relieve pressure on the ligament, and to desensitise it.

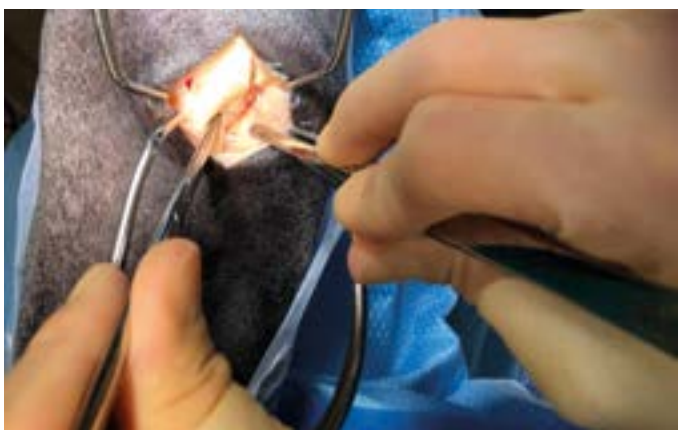
The origin of the suspensory ligament origin sits in a closed space between the cannon and splint bones and a band of fascia. It is thought that pain and lameness may in part be a result of pressure on the ligament and the deep branch of the lateral plantar nerve, which runs through and provides sensation to the suspensory ligament. Cutting the restrictive band of fascia relieves pressure and removing the nerve desensitises the ligament.

This is unsurprisingly effective in providing pain relief and improvement of lameness, but does nothing to aid healing of the ligament. Despite this, it is not common to see exacerbation of the injury following surgery and when the horse returns to work, but this is a risk. Therefore, not all horses are considered good "surgical candidates".

"Regenerative treatments act by stimulating formation of new tissue"

Horses not considered good candidates for this surgery include those with acute injuries, extensive ligament damage, or poor conformation such as straight hocks and over-extending fetlocks that place added strain on the suspensory ligament.

It is important to note that horses with limb hyposensitivity (decreased sensitivity), as is the case following such treatment, may not compete under FEI regulations. British Dressage, British Eventing and British Showjumping are all members of British Equestrian, which has adopted the FEI code of conduct for the welfare of the horse, and also do not allow horses with limb hyposensivity to compete (see news, 24 February). This is clearly a vital consideration for owners before deciding on this treatment.



Surgery can be the optimum treatment option in certain cases, such as acute tears of the suspensory ligament branches

FUTURE PROSPECTS

THE success of treatment of suspensory ligament injuries very much depends on the cause, location, and severity of injury. In general, more severe injuries and chronic disease carry a more guarded prognosis, and the prognosis for degenerative suspensory disease is poor. Acute injuries can respond better to treatment, but outcome will still be dependent on severity.

Acute suspensory branch injuries have a fair to good prognosis, and favourable results have been seen in cases that are suitable for surgical treatment. Results with regenerative treatments for suspensory desmitis have been mixed, although reported case numbers are small so this inconclusive. Cases of chronic proximal suspensory desmitis managed conservatively have a guarded to poor prognosis.

Shock-wave therapy has been used with fair success, but still approximately half of reported horses remained lame or developed recurrent lameness. Better results have been seen with neurectomy and fasciotomy, as should be expected given the nature of the surgery. **H&H**

NEXT WEEK **Equine obesity: predisposing factors and management**

Risk factors for PSD

PROXIMAL SUSPENSORY DESMITIS (PSD) can affect horses of all ages and disciplines, but it is a particularly common problem in dressage horses. Dressage movements such as piaffe and canter pirouette result in increased extension of the hind fetlock joints and increase loading of the hind suspensory ligaments.

Other factors are also in play, such as the horse's conformation – horses with straight hocks often also hyperextend their hind fetlock joints, and there is an association with PSD. Fitness has an influence too – an unfit horse will develop muscular fatigue more quickly than a fit individual, and this may in turn lead to incoordination and predispose the animal to injury.

Once a horse has reached skeletal maturity, training only increases wear and tear on tendons and ligaments, so it is sensible to do the fewest repetitions necessary of movements loading the suspensory ligament, in order to minimise injury risk.

The surfaces that the horse works on will also play a role in fetlock extension, but predicting mechanical properties of surfaces is difficult, and will depend not just on the surface material, but also the base layer, drainage and maintenance.

Pictures by Matt Smith