

Laminitis in the horse: part I

Laminitis in the horse is one of the most common cases presented in mixed and equine practices and yet there are few papers published which distinctly cover the nursing care of these horses. This article will review papers and concentrate on the scientific advances and the role of the veterinary nurse in long-term management of the laminitic horse, writes Laura Ann McDonnell RVN



In the UK, it is estimated that approximately 8,000 horses experience laminitis each year. A survey, completed in the US, confirmed that, save for colic, laminitis was the most common reason for presentation of a horse or pony for veterinary treatment. Another survey, undertaken in the 1990s in the UK, confirmed that 61% of affected animals were out at grass before developing the condition (Harris P et al, 2006).

It might, therefore, be assumed that the best route to prevent laminitis, or to treat affected animals, would be to keep them off pasture. However, for the majority of horses, total restriction is not a viable option for reasons including cost of feed, welfare and other health concerns. Nursing and long-term care of affected animals has received little attention in literature, yet at any time, there is a horse with laminitis that needs long-term management (Wrigley, 2011). This article will look at the scientific advances in the diagnosis and treatment of laminitis and the role of the veterinary nurse in the long-term management of the condition. It will also address perceived deficiencies in communication with owners regarding the disease itself, its treatment options and the prognosis following types of treatment. In order to explain the process of the disease to horse owners, diagrams differentiating between a healthy hoof and one with laminitis may be a useful tool.

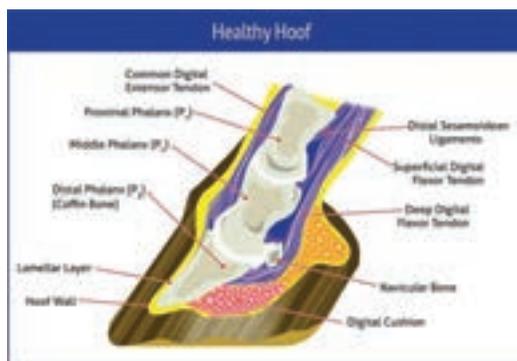


Figure 1(a).

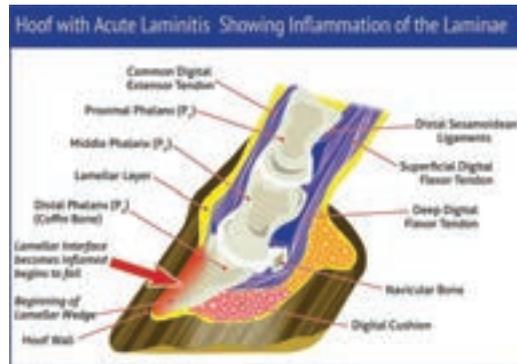


Figure 1(b).

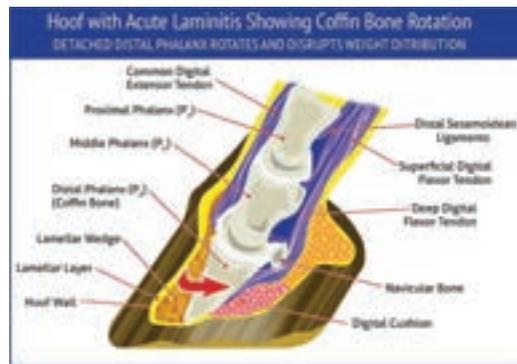


Figure 1(c).

Figure 1: Overview of horse's laminae in healthy and diseased shows: (a) Healthy hoof, (b) inflammation of laminae, (c) coffin bone rotation. Hoof illustrations: Canadian Horse Journal.

DIAGNOSIS, DIFFERENTIATION AND COMMUNICATION

It is important to differentiate between foot pain due to the displacement of the third phalanx (P3) and due to other conditions, such as poorly regulated pituitary pars intermedia dysfunction (PPID) or hyperinsulinaemia associated with obesity (Wrigley, 2011). Laminitis can also be caused by conditions such as pleuropneumonia, enterocolitis, peritonitis and endometritis. Endotoxaemia was long considered to be the common denominator and a laminitis trigger: however, experimental endotoxaemia to healthy horses does not always cause laminitis (Orsini et al, 2009). Correct diagnosis of the cause of laminitis is essential for the development of an appropriate treatment plan (Wrigley, 2011).

Each case of laminitis is different and in mild cases some horses return to work within a few weeks. In other cases, treatment and recovery may take months. Outcomes can be total or partial recovery or euthanasia. The successful outcome of a case is dependent on good communication between the veterinarian team, owner and farrier (Walsh, 2004). The nurse's role can include assisting with queries and clarifications in relation to the condition, causes, available

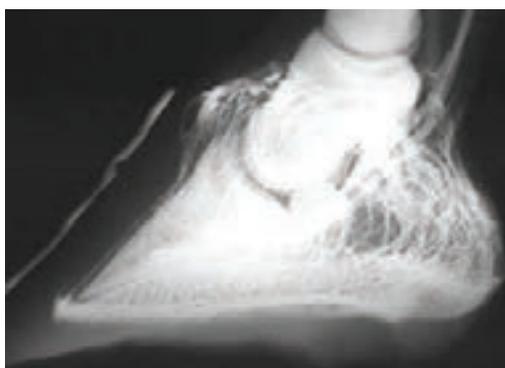


Figure 2(a):
Normal
venogram.

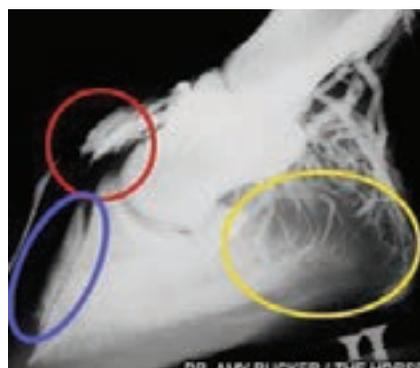


Figure 2(b) (top right) shows high-scale laminitis. Blue oval – dorsal laminae compromised; yellow oval – excessive loading on heels; red oval – blood vessels are truncated.

diagnostic tests, nursing and treatment plans, further treatment options and possible outcomes (Walsh, 2004).

DIAGNOSTIC TESTS

Radiographs can be used to diagnose laminitis; however, with scientific advances, venograms are becoming more widely used in the area (see Figure 2). According to Eastman et al (2012), the use of a venogram is an extremely useful tool and is especially useful at the onset of the disease as, in addition to baseline measurements, it can also show the level of damage that has already occurred within the hoof. Early use facilitates timely or prompt decisions, as venograms can assess existing hoof damage which may not be visible in radiographic detail.

After the initial venogram, a follow-up venogram is recommended three to 14 days later. When used during a long-term treatment plan, it can indicate whether the blood supply to the hoof is deteriorating; it can also show progress after the hoof is in recovery. Once a diagnosis is made, foot management should be agreed and implemented in order to prevent further deterioration and pain.

ACUTE LAMINITIS

Many horses requiring long-term management often have acute but periodic laminitic episodes. The acute stage of laminitis usually lasts up to 72 hours. Approximately 80% of horses are nursed successfully with conservative treatment, immobilisation and rest, together with anti-inflammatory medication (Morrison, 2004). Clinical signs will be an increased respiratory rate and heart rate, the horse may also have an elevated temperature. A horse's hoof temperature will change naturally throughout the day, depending on ambient conditions, but in cases of laminitis the hoof should be monitored closely for any sustained periods of increased temperature. The horse may also show the typical 'sawhorse stance' where it is trying to shift the weight from front limbs onto hind limbs (van Eps, 2010).

Movement should be restricted immediately, the horse should be confined to a stable and not walked unnecessarily until a veterinary surgeon has been called. Deep comfortable bedding should be provided, preferably of sand which is more comfortable for the foot (see Figure 3). Some horses may be reluctant to lie down in sand: in this case, a thin layer of straw may be put on the sand or a blanket/rug fitted on the horse. If the horse is recumbent for a long period, he should be monitored for decubital sores.

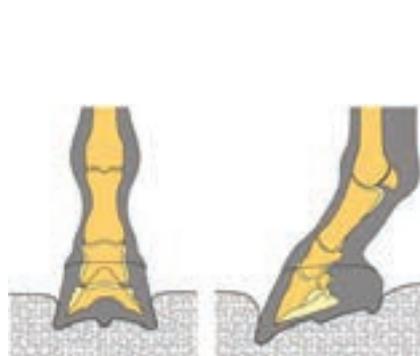


Figure 3: Illustration of the how the properties of sand contour to the solar surface of the foot and allow the horse's toe to sink in the sand and elevate the heel. Illustration: Institute of Applied Equine Podiatry.

Sores can be prevented by applying a foam donut bandage to the tuber coxae. Faecal and urine output should also be monitored (van Eps, 2010). The behaviour of the horse will also be an indication of pain.

CHRONIC STAGE: COMPENSATED VERSUS UNCOMPENSATED LAMINITIS

In the chronic stage, where long-term management will be necessary, the displacement can either be in terms of rotation, medial, lateral sinking or vertical sinking. The degree of damage can then be further classified as compensated (stable) or uncompensated (unstable), (Morrison, 2011).

In compensated cases, the coffin bone is still to some degree stable but out of alignment. The foot is still able to grow and regenerate the hoof wall and sole in all areas of the foot (Morrison, 2011). The foot may also have a high heel or increased growth in the toe region. This irregular growth pattern is the foot's way of compensating for the imbalance between the rotational forces on the coffin bone and the lamellar strength. The goal in these cases is to restructure the compensated foot over time (Morrison, 2004).

In uncompensated cases, the coffin bone is actively displacing, the laminae are tearing and the sole corium is being compressed. Sole tissue cannot be produced or regenerated in the parts of the foot. As a consequence, these horses and ponies suffer chronic pain and are prone to infections (Morrison, 2004).

FOOT MANAGEMENT IN COMPENSATED LAMINITIS

In order to achieve a balance between the rotational forces on the coffin bone and the lamellar attachments, a combination of heel elevation, axial sole/frog support and improved breakover is needed (Morrison, 2004). The first

step in rebalancing the foot is foot trimming and the second is shoeing.

FOOT MANAGEMENT IN UNCOMPENSATED LAMINITIS

Morrison (2004) advises using the same trimming and shoeing techniques as in the chronic compensated case. Uncompensated cases are more prone to secondary complications such as bruising, osteomyelitis, abscessation, seroma formation and coronary band shearing. However, if the foot does not show any continuous improvement with shoeing, or if the coffin bone has penetrated the sole corium, he recommends that a deep digital flexor tenotomy (DDFT) may also be needed at this point.

DEEP DIGITAL FLEXOR TENOTOMY

According to Morrison (2011), transection of the DDFT is a controversial treatment for chronic laminitis. In a retrospective study of 245 chronic cases of laminitis it was shown that with realignment shoeing and a DDFT, 51% of the cases were considered a success. In each case, realignment shoeing was completed first and then the DDFT was performed. This was a retrospective study so there were a lot of variation in the age and breed of horses, which gave a more balanced result. In each case, a shoe made at the proper angle was applied and radiographs were taken to ensure correct placement:

the shoe was then glued in place. The toe of the foot was left open to minimise the chances of abscesses forming. After both procedures, shoeing and the DDFT radiographs were taken again to ensure ideal alignment. Each case was then re-shod in the same way at five to six-week intervals. Success was classified on the grounds that the animal survived for a minimum of one year post surgery, maintained a good body condition and had no more than an Obel grade 2 lameness (see Table 1). The cases which had the highest level of success rate were those with mechanical failure which was isolated to the toe only and had no radiographic evidence of sinking. The results are summarised in Table 2.

Grade 1	At rest the horse will alternately and incessantly lift the feet. Lameness is not evident at the walk, but a short, stilted gait is noted at the trot.
Grade 2	The horse moves willingly at a walk, but the gait is characteristic of laminitis. A hoof can be lifted off the ground without difficulty.
Grade 3	The horse moves reluctantly and vigorously resists attempts to lift a forefoot.
Grade 4	The horse must be forced to move and may be recumbent.

Table 1: Obel's degree of lameness. Data from Obel N. Studies of the histopathology of acute laminitis. In: Almgvist and Wilc-sells Bottrykeri Ab Uppsala (thesis); 1948. Van Eps, 2010.

Table 2	Success rate
Moderate bone disease, no sinking or penetration	93%
Penetration and no sinking	88%
Cases with no bone disease, no signs of sinking or penetration	83%
No sign of sinking	71%
One limb affected	52%
Front limb affected	51%
Two limbs affected	50%
Four limbs affected	50%
Hind limbs	50%
Severe bone disease, no sinking or penetration	44%
Penetration and sinking	25%
Signs of sinking	18%

Following surgery, a controlled exercise programme was followed. This involved either walking-in-hand or limited turnout in a small paddock to allow physiological loading of the limb. If the horse remained on strict box rest for an extended period, there was the potential for contracture of the deep digital flexor tendon. If this occurred, any benefit of the surgery would have been lost.

He concluded that performing the deep digital flexor tendon without applying the re-alignment shoeing, only produced short-term clinical improvements and rarely improved the prognosis, and that the most critical part of the protocol is managing the foot.

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