

Explaining Laminitis and its Prevention



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Chapter 5 - The Causes of Laminitis

None of the following are really causes, as we do not exactly know what precisely causes an animal to suffer from laminitis. We do know that there is a number of situations which commonly predispose animals to suffer the disease. These predisposing factors I have listed below; they can occur singly or in combination.

1) Obesity / Overeating

This is responsible for most of the cases of laminitis and founder seen in the UK. They are all due to managemental errors. It must be remembered that most of the native ponies were bred in regions where the available vegetation is sparse. Bringing such ponies down onto lowland grasses which have been selectively bred for their nutritional value and which are usually chemically fertilized, is to court disaster. In addition, most native ponies are greedy and few are asked to do any work; put these things together and you have a recipe for laminitis. Many horses and ponies first suffer an attack of laminitis or founder when they are away at stud. Mares at stud are managed on a group or herd basis rather than individually. The statement that native ponies cannot tolerate modern grass pastures has been shown to be due to a metabolic difference between ponies and horses. Ponies and cobs use their feed more efficiently, the food being stored as fat for harder times. This metabolic difference is in part due to insulin insensitivity in ponies. The pony's muscle and liver tending to convert the glucose absorbed from the gut to fat rather than use it immediately for energy or store it as glycogen. This syndrome is not new but has a new name Metabolic Syndrome. The innate resistance to the action of insulin is also thought to contribute to constriction of the arteries in the feet by encouraging the formation of vasoactive compounds. From what has been discussed so far it can be appreciated that prevention of laminitis is much easier than cure. Allowing ponies free range on cattle pasture is asking for trouble. It is not a question of too much protein or too much carbohydrate, protein will be used as an energy source if there is insufficient carbohydrate in the diet. As a rough rule of thumb native ponies and most horse's can live and perform all but hard work when fed a forage based diet. This means hay and alfalfa, no cereals, no cooling mixes, no herbal mixes, no cereal containing nuts, just good straightforward forage.

2) Toxaemia

Any animal which suffers toxaemia is predisposed to laminitis and founder. Toxaemia means the circulation of toxins, be they chemical, viral or bacterial, in the blood stream. Such conditions as pleurisy, pneumonia, diarrhoea, retained foetal membranes after foaling are all common causes of equine toxaemia. Peritonitis associated with colic is a common cause of toxaemia. Overeating of rich food whether it be grass or grains can result in a form of toxaemia. When an excess of rich food is consumed, as it is digested, the acidity of the bowel contents increases. Above a certain acidity the normal bacterial population of the bowel are killed and replaced by bacteria which can survive in the changed conditions. The cells of the original bacteria contain toxins which are released when they die and are absorbed through the bowel wall into the horse's circulation. Toxins in the blood stream under certain conditions and in combination with changes in the animal's hormones can lead to the closing down of the arterial supply to the laminae which has been shown to be the first change of laminitis.

Mares with a uterine infection at or soon after foaling often founder and founder badly. This is usually associated with a retained placenta (cleansing). Very often the bulk of the cleansing comes away but a small piece from within the tip of the empty horn remains attached and sets up a toxaemia. This is why it is so important to lay out the cleansing from mares after foaling and make sure no bits are missing. If part of the cleansing is retained the mare should receive antibiotic treatment by injection. In addition the uterus should be pumped full of hot water and then siphoned empty repeatedly until the effluent is clear. The offending piece of cleansing can often be removed during this procedure. This uterine lavage should be done twice daily until the infection is overcome.

3) Mechanical / Trauma

In this group are included all conditions which lead to a period of abnormally high or protracted weight bearing. A common scenario would be if a horse was very lame on its right fore leg, for example due to infection or a fracture; it might well founder on the left fore due to the increased weight bearing. It is not just stationary weight bearing which may cause the problem. It is not uncommon for hunters in winter, hammering along the roads, or jumping ponies on the hard summer show grounds to develop laminitis.

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The mechanism in the latter cases is unlikely to be quite the same as the toxæmia cases. The recurrent trauma may result in direct constriction of the digital arteries or formation of excessive oedema fluid.

4) Bad or irregular foot dressing

The former is the fault of the farrier, the latter the fault of the owner. By bad foot dressing I am particularly referring to chronic founder cases in which it is so important to keep the front walls of the feet rasped back and the heels lowered to the correct height. Failure to do this can lead to recurrent bouts of lameness. The same argument applies to feet if they are neglected for more than 6 weeks. Failure to dress the feet forwards can result in a build up of pressure due to excessive (hyperplastic) laminar horn. Failure to keep the heels at a correct height will allow the phalangeal axis to become broken forward leading to lameness. It is hard work dressing feet forwards and awkward work when dealing with Shetland ponies unless the farrier is a dwarf! Over-trimming feet or fitting shoes which cause sole pressure can also cause laminitis.

5) Drug related

Some drugs, in particular the corticosteroid group of compounds, are known to cause laminitis, particularly in high risk animals. Corticosteroids have been shown to increase the tendency of the arteries in the foot to constrict, thus cutting down the blood flow. The classic case is the administration of long acting preparations to fat ponies at grass suffering from sweetitch. The corticosteroid will probably give some relief from the irritation of midge bites (the cause of sweetitch) but it might make all the ponies feet founder to the stage of solar prolapse within 48 hours! Sweetitch should be controlled by removing the animal from the midges, stabling at dawn and dusk, and using one of the effective insect killer / repellents which are now available.

The administration of wormers is soon followed by laminitis on relatively rare occasions.

6) Stress

Any form of stress may predispose animals to develop laminitis. The most common would be long journeys, particularly in hot summer or cold winter conditions. When animals are stressed they respond by releasing higher than normal levels of their own corticosteroid hormones from their adrenal glands. This presumably mimics the effects of artificially administered steroid drugs and increases the tendency of the digital arteries to constrict. Vaccination sometimes precedes an attack of laminitis. The loss of a long time companion has also been known to precede laminitis.

7) Pituitary cancer

The pituitary gland is a small but very important gland which is found just under the horse's brain (Fig 47) . The pituitary secretes hormones which control all the other endocrine glands in the body and thus the general metabolism. It is unfortunately not uncommon for elderly animals to develop a benign cancer of this gland. The gland starts to enlarge and part of it (the pars intermedia) secretes abnormally high doses of hormones which particularly affect the adrenal gland (situated near the kidneys). The animals tend to become Cushingoid; this means they lose condition, drink excessively and may become diabetic. The animals are more prone to secondary infections than normal. If they live long enough all these cases will develop laminitis and founder. The first change seen is a failure to shed their winter coat, the coat then becomes abnormally long or matted (Fig 48 & 49) . The animals then tend to sweat more than normal. The change in hair coat may at first be slight and not involving the entire body, for example an Arab developing feather more fitting for a cob. Many of these cases seem to suffer a severe attack of laminitis in the Autumn. (I personally believe that Equine Cushing's disease is due to a dysfunction in the pineal gland and that the changes in the pituitary gland are secondary). The cancer does not spread and some animals may live into their twenties with such a condition without it making their lives unbearable.

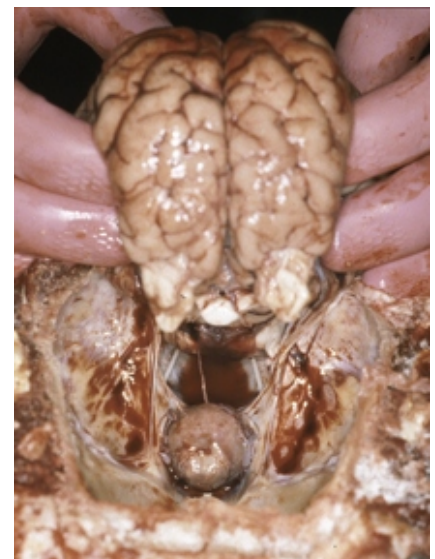


Figure 47. An old pony with a pituitary tumour. The pituitary gland is the spherical tissue in the centre of the picture tucked away beneath the brain. The pituitary gland is abnormally enlarged due to the tumour.

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Younger animals seem to be increasingly affected. I have had 8 years old ponies with Cushing's disease. There are treatments which control many of the side effects of Cushing's disease. Should these treatments not work or stop working, the quality of life deteriorates and euthanasia is the best decision. There is a confirmatory laboratory test which can be made. This involves the measurement of endogenous ACTH, insulin, cortisol and glucose. I do not recommend the use of ACTH stimulation nor dexamethasone suppression tests as these can sometimes induce or exacerbate laminitis.

Laminitis mythology

Drinking cold water after exercise may cause colic but not laminitis.

Allergies; There is no scientific evidence to support the role of allergy as a cause of laminitis.

Pregnancy; Pregnant animals can develop laminitis just as easily as barren animals.

Oestrus; A few mares have been reported to show laminitis-like symptoms in association with the onset of oestrus (when they come into season). Similarly these signs are reported to disappear when the mare finishes her season. These cases are no doubt related to the hormonal status of the mare. These cases can be difficult to manage. Vitex seems to be helpful in modulating the hormonal balance.

Heat in the feet; Foot temperature normally varies throughout the day. Feeling for the temperature of the feet to diagnose laminitis only demonstrates lack of knowledge of the condition.

Standing in streams or cold hosing; Any benefit the animal may have felt from the cold immersion was probably more than cancelled by having to walk to get there! Cold water tends to both numb the feet and cause the arteries in the feet to constrict. Pain relief can be effectively achieved by means of drugs and vasoconstriction is the opposite of what is needed in a laminitic foot. Hot water treatments and poulticing have also been tried. Heat will cause beneficial vasodilation; however this dilation is likely to be very weak and short lasting. Much more effective vasodilation can be achieved by phenoxybenzamine.

Bleeding; It used to be a popular treatment to make a cut in a jugular vein and remove about a gallon of blood. There was some rationale for this in that this did drop the blood pressure which is abnormally high in laminitis cases. This effect was not long lasting and did weaken the animal albeit temporarily. Drug treatments have now superseded the need for this procedure which was known as jugular phlebotomy.

Laminitis does not just affect the front feet, although the front feet are the more commonly affected. One, two, three or all four feet may be involved, and in any combination.



Figure 48. A typical example of the changes in hair coat of a Cushing's disease case.



Fig 49. All Cushing's cases develop swellings above the eyes, in the supra-orbital fossae. These are abnormal fat depots. Abnormal distribution of fat depots, i.e. thick crest, fat over loins, tail head and around the sheath or udder, are typical of Cushingoid horses and ponies.