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Weeks 5 and 6

What are five of the most common pathologies of the Equine foot? Tell me what the symptoms are of the particular pathology, how you would treat the pathology and how you would explain to the client how to prevent it from reoccurring. Use illustrations or photos to exhibit each particular pathological hoof with each disease. Mark the photos as to how you would trim them to correct/treat. Compare traditional farrier treatments of each disease with natural treatments and defend the natural treatment of the hooves.

I had a hard time deciding which pathologies to choose, as the most common in one part of the world is not necessarily the most common in another, and what is common in horses isn't necessarily the most common in donkeys. In the end I decided to go for what appear to me to be the most common pathologies in donkey feet in Western Europe, ie separation of the laminae leading to laminitis, abscesses, upright feet with flat soles, water damage and club feet. I appreciate that this list might not be quite what you were expecting, but I think they are the ones I am going to be facing most often so I'm going to go for them.

Club Feet – A Pathology Caused by Injury

Club feet in donkeys are mostly seen in elderly working donkeys in the southern parts of Europe, such as Portugal, Spain and Greece. They are often the result of ill-fitting working collars or being tethered by the pastern. Damage above the foot leads to a reduced range of motion, shortening the stride. The reduced stride length tends to be accompanied by a change to toe-first landing rather than heel first, which reduces wear at the heel and encourages the foot to become more upright. One foot thus becomes more upright than the other, which is basically the definition of 'club footed.' It is most often seen in one of the front feet.



I have so far not been able to source photos of donkey club feet (I'm working on it, and will add them later if they turn up in time!) so I'm using these pictures of horse feet taken from Peter Ramey's HoofRehab site.

The standard farrier teaching is to treat feet as pairs, either a front pair or a hind pair, and to make sure they match. The result is that flare is often left on the toe, as it appears to match the angle of the the normal foot. This brings the breakover point forward, further shortening the stride and encouraging the foot to remain upright. The only other way of making the feet 'match' is to lower the heels. If this is done too aggressively however, the live sole will be cut and the foot will respond by growing more heel as soon as possible, exasperating the problem.

The way out of this situation is to stop worrying about whether or not the feet match, and trim each one individually to it's best form. Reduce the heels to the level of the calloused sole (ultimately aiming at something like the black line in the photograph, but it will get there in it's own time!), remove the flare, as shown by the red line, and mustang roll the toe to encourage a better breakover point. The feet will not look such a perfect pair to begin with, but the stride will begin to lengthen, the sole will callous more, pushing up

the internal structures of the foot as it does so, and the heel will naturally lower itself as the sole hollows out.

If the source of the original injury can be found, this should be addressed. In this case the horse was diagnosed with suprascapular nerve damage and shoulder atrophy and a professional sports massage therapist was employed to stretch and massage the limb, helping resolve the original problem. Five months later, as the photo below shows, the foot is much more normal, the stride length has lengthened and the heels have lowered beautifully. By not insisting that the feet 'match', they have been allowed to 'match' themselves, naturally.



To prevent the condition recurring, the foot must be monitored and maintained at the correct angle, and the cause of the original injury considered. In a horse, rider imbalance or a badly fitting saddle may be the cause, so prevention will involve changing the saddle or a course of riding lessons. In elderly working donkeys, retirement may be in order, or changing the collar in a younger animal. Tethering by the pastern is simply asking for trouble, especially using a knotted rope or chain. Encourage as much movement as possible, with 24 hour turnout. Plenty of walking on hard ground will help the stride to develop and the muscles to rebuild as much as possible.

Diseases of Civilization

Club feet are the result of injury, but the four other pathologies I am going to discuss, ie water damage, upright feet with flat soles, separation of the laminae and abscesses, are normally the result of the way we keep our animals. They are essentially 'diseases of civilization', caused by removing animals from their natural environment and depriving them of the exercise they need to keep their feet healthy. The natural environment of the donkey is rocky, scrubby, semi-arid uplands. Their small, tough feet with thick walls and soles possess great traction. The hoof wall absorbs water more easily than a horse's, enabling it to maintain a suitable moisture level in its dry environment. Plenty of movement on the rocky terrain drives up the sole, which is naturally more concave than in their horse cousins. The toe becomes rounded in a similar fashion to the mustang roll – perhaps it's a burro roll?



Here are some feral donkey feet taken from Cindy Sullivan's site tribeequus.com. The burros roam free around Oatman, Arizona. These are, presumably, what donkey feet *should* look like, and therefore what we should be aiming at with our donkeys' hooves.

Just in case you can't believe that those are donkey feet, here's a photo of the whole animal.



Upright Feet, Flat Soles

As soon as a donkey is placed on soft ground, even plenty of exercise is not sufficient to drive the mechanism which concaves the sole and keeps the internal structures of the hoof high within the hoof capsule.



These feet look wonderfully strong and healthy, and are maintained that way by regular exercise rather than trimming, but the ground is not hard enough to produce a mustang roll and despite the fact that the exercise is obviously quite sufficient to keep the feet well trimmed and the frog well developed, the sole is very flat and the foot is starting to look a little upright. Many people consider that donkeys' feet are 'supposed' to be upright, but the feral donkey's feet and the photograph below of a naturally worn donkey's foot do not support this view.

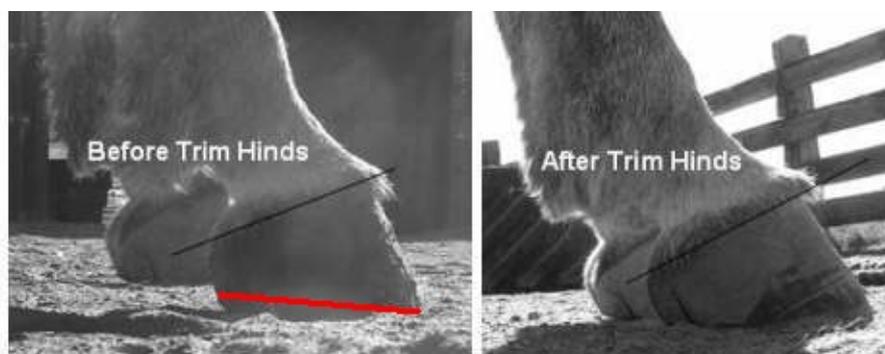
Naturally Worn Donkey Hoof

The naturally worn Donkey hoof with enough mileage or rugged terrain will wear their hooves in a similar low heeled short toed fashion as does the horse.



The only problems I foresee in the flat soled donkey pictured above is that if the upright foot shortens the stride then the foot might become more and more upright as the heels are used less and less. Also, without enough exercise on hard ground to tamp down and round off the wall, it may be liable to 'unravel' and the white line may stretch, possibly allowing infection to enter. Perhaps an area of hard-standing would help

prevent this. A farrier may be tempted to 'scoop out' the sole, making it appear more 'natural'. If the inner structures of the foot are not well driven up inside the foot, however, this may make the sole too thin and render the donkey susceptible to abscesses and bruising.



A farrier who recognized that a donkey hoof such as the one shown above was too upright might trim along the line shown in red above, but as the flat soled donkey shows, this is not always possible without cutting into live sole. Regular exercise on hard ground not only drives up the sole in a beautiful concavity, in upright footed donkeys it also drives it up more at the heels, allowing the heels to be trimmed back without cutting into the sole.



The donkey shown above still has very upright feet and is currently 'in rehab.' Four months previously her soles were 'live' right down to the floor. She is walked in hand for an hour a day on hard ground. The photo of her soles shows that although the sole still goes right down to the floor at the toe, it has started to 'rise' at the heels – there is a small rim of hoof wall ready to be rasped or worn away. A few days after these photos were taken the wall in these areas started to chip away quite quickly and noticeably and rather than allow nature to take it's course I rasped them down, lowering the heels as I did so. Astonishingly, the lowered heels seemed to allow the whole process to speed up, and two weeks later exactly the same effect was seen and I was able to lower the heels further still. The concavity in the sole had also deepened quite noticeably over the same two week period. The lowered heels allow the hoof mechanism which pumps blood around the foot during exercise to function more efficiently, supplying more nutrients and removing waste products more quickly. The 'ripples' in the hoof wall also appeared to fade considerably, though I am not a hundred percent certain if this is due to the extra blood supply allowing more hoof matrix to be produced from the lamellar corium, filling out the hoof wall, as it may also be due to wear in the dusty and sandy tracks we walk.

I would advise any owner of a donkey with upright feet and flat soles to ensure that the donkey gets sufficient exercise on hard ground. Exercise by itself does not appear to be sufficient to ensure ideal foot health in donkeys. Their feet are adapted to cope with hours of daily exercise on dry, rocky terrain to the extent that they don't seem to function correctly without it. An area of hard standing might help. Donkey owners have noticed that their animals' feet need trimming much more frequently after they have covered their concrete floored stalls with rubber mats. I haven't yet been able to ascertain what effect this had on the concavity of the soles, but every little helps.

In extreme cases, drastic action may be taken to get the animal off to a good start.



This photo, taken from Pete Ramey's website, shows some serious removal of a donkey's surplus sole. The frog is very high up within the capsule, showing that it is 'safe' to trim off a good thickness of sole as all the internal structures are well out of the way. If the frog were lower, it would not be possible to do this. I'm not sure I would like to do this to an animal, but much as I enjoy walking with a little donkey companion by my side, I think I might have to undertake a World Tour to get this foot into shape just by taking him for walks!

Water Damage

Another problem related to keeping donkeys on soft ground, especially in the wetter parts of Western Europe like the United Kingdom and France, is their susceptibility to water damage. Donkey hoof wall is adapted to dry, rocky terrain and absorbs water more easily than horse hoof. Soft ground does not 'tamp down' the horn into a hard, dense mass and makes it even more likely to absorb excess water. The result is water damage, as shown in the photo below.



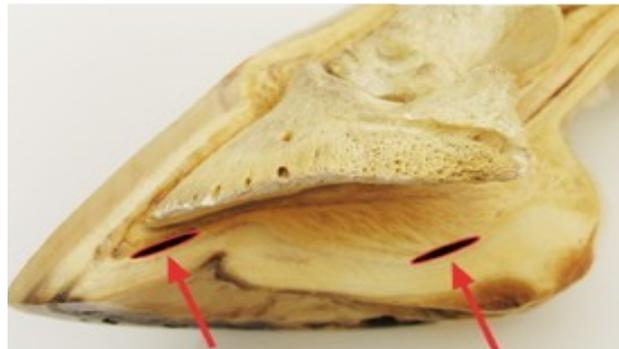
The main problem with this is that owners and farriers alike take one look at the wall and decide that it looks too dry, and proceed to soak the feet and then oil them to hold the moisture in. This is not exactly going to help the situation! The hooves need a chance to dry themselves out. Once again, an area of hard standing, preferably either under cover or at least very well drained, should be provided in an area where the donkey will choose to use it, possibly where hay is provided, or in his favorite resting area in his paddock. Oiling feet has gone out of favor recently as it tends to soften the hoof wall, but it may be beneficial to apply oil to *dry* feet to prevent any more moisture soaking into the foot, maybe if the donkey is stalled overnight before being turned out into sodden pasture for the day.

I have experimented with dried up curls of horse hoof trimmings and found that ones that have been soaked in oil will almost never uncurl, even when later immersed in water, suggesting that the oil effectively seals out

the water. Curls of horse hoof trimmings that were soaked in water to uncurl them remained uncurled for several days after removing them from the water if they were dunked in oil before being given a chance to dry out. Ones which were not oiled started to curl back up within a few hours. The most important thing then is to ensure that the hooves have a chance to dry out. After they are thoroughly dry, oil may help to prevent moisture being absorbed into the hoof wall. Oiling wet hooves is simply sealing the water in.

Foot Abscesses

Damp conditions which render the wall and sole of the hoof soft and permeable and soft conditions which do not pack the sole down hard, hollowing out the sole and driving the inner structures of the foot high up into the hoof capsule, predispose the donkey's foot to another problem – abscesses. If any 'live' part of the foot, in particular the corium from which the horn of the wall, frog and sole grow, becomes damaged or infected, circulation within the foot is often not sufficient to allow the affected tissue to be removed by normal means and a pocket of dead or damaged tissue will build up, as shown in the photograph below, indicated by the red arrows.



Sometimes the damage is caused by an injury, such as a nail or thorn entering the foot through the sole or the coronary band, but a thick, hard sole is less likely to permit such an injury. A very upright foot, as is so common in donkeys, concentrates the weight of the animal onto a small area at the tip of the pedal bone. An upright foot is likely to be accompanied by a toe-first landing, putting yet more pressure on this area. Compression of the corium here is likely to lead to damage, especially if the white line is stretched and soft, allowing infectious agents to enter and travel up towards the compressed area. Sometimes the upright heels will be contracted and circulation in the area of the lateral cartilages will be impaired. Some of the tissue will die off, and ultimately an abscess will form.

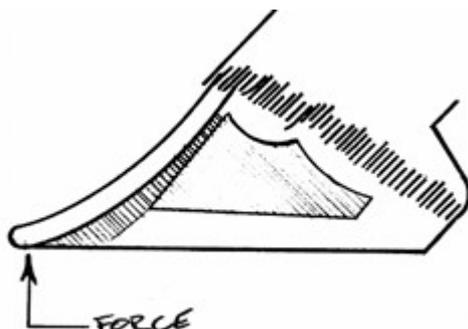
The hoof is a rigid structure and any inflammation will cause intense pain, so a donkey with an abscess is likely to become lame quite suddenly and noticeably. There may be heat in the foot, and usually only one foot at a time is affected. As the pressure builds up, the abscess will start to spread along the weakest route it can find. Usually it will travel down through the sole, sometimes it will find it's way down the white line, and sometimes it will travel up the white line and finally burst it's way out at the coronary band.

Traditional treatments tend to involve digging into the sole and soaking the foot to soften the sole still further and encourage the abscess to burst by allowing it an easy 'short cut' to the outside world. This is tantamount to surgery in my opinion, and many farriers and natural hoof care providers alike now prefer to allow nature to take it's course, possibly aided by soaking the foot in a solution of vinegar.



Once the abscess has found it's way out, the pain should subside. The foot should be kept clean, and the wound can be soaked or syringed out. The most important part of the treatment, however, is exercise. Plenty of gently exercise will increase the circulation in the foot, allowing toxins and waste products to be removed and nutrients and oxygen to be supplied to the regenerating tissues in the foot.

The best way to treat abscesses is to prevent them. Hooves that are kept dry and exercised on hard ground will be tough and hard, packed into a solid callous that resists penetration by water, dirt, bacteria and rusty nails! The sole will be thicker, and also more concave, giving extra protection. Hooves that are not too upright and do not land toe-first during exercise will not compress the corium and the toe. Hooves that are not too long at the toe and have a naturally shaped mustang-roll will not flare and pull at the white line and will not easily permit bacteria to work their way up inside the hoof wall.



Which brings me to the final hoof pathology I want to discuss – separation of the laminae caused by overlong toes.

Separation of the Laminae

The laminae, which bind the hoof wall to the pedal bone, are complex and highly susceptible to damage, but in this essay I am going to concentrate on the damage caused by overlong toes, as this is the most common form of laminitis in donkeys.

Many donkeys' hooves grow very upright, with long heels and short toes, but many manage to grow their toes long enough that they start to pull away from the pedal bone. The laminae can be likened to an array of 'zip locks', like those found on resealable plastic bags, running up and down the inside of the hoof wall joining the pedal bone to the hoof. The zip-locks on the pedal bone stay put, but the ones on the inside of the hoof grow downwards from the coronary corium and slide down as the hoof grows, but staying 'locked into' their counterparts on the hoof wall. If the toe is kept short and rounded by exercise on hard ground, then these zip-locks stay zipped up all the way to the ground, but if the toe is long, force is applied to them as the donkey walks, pulling the zip-locks apart, but unlike plastic zip-locks, they do not reseal. Once they have been pulled apart, they not only stay apart, but they also encourage the zip-lock further up to peel apart. This can start quite insidiously, as in the slightly stretched white line visible in the flat soled donkey shown on page 3. The white line is the visible ends of the laminae, or 'ziplocks' – they look stretched when they have started to peel apart.



If the toes are allowed to grow longer, then the separation will become apparent by looking at the hoof wall in profile, as shown in the photo above – note the concavity in the red line. This foot needs to be trimmed back, removing all wall lower than the sole and the flare on the toe needs to be removed (as shown by the red line in the photograph below) possibly backing up the toe to the white line.

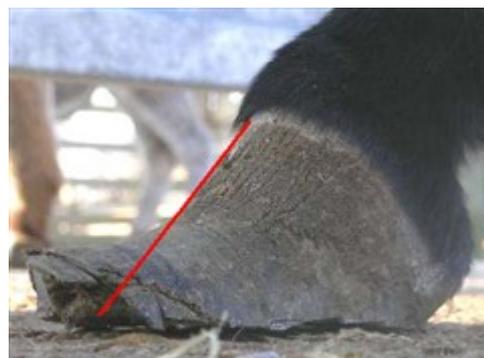


As the toe grows, less weight will be placed on the toe and more on the heel. This slows down the rate of hoof growth at the toe, so any growth rings visible will be more closely spaced at the toe than at the heel. This is already evident in the photograph on the right above.

If the situation is allowed to continue, the feet may eventually become shaped like the one shown below, taken from the Donkey Sanctuary's website.



The x-ray shows that in this hoof only the very top section of the hoof is still 'zip-locked' to the pedal bone. The lamellar separation is almost complete. Initial treatment is much the same for traditional and natural hoofcare providers and consists of removing the extreme flare and completely remodeling the foot.



The photograph on the left shows how much surplus wall can be cut away. First, the worst of the toe is cut off, then the worst of the flare removed, approximately following the red line. The wall is trimmed back using the sole as a guide, removing flare where appropriate. At the end of the trim, this is how the foot looks.



So long as the toe is kept short and rounded, the zip-locked laminae at the top of the hoof will stay locked together as the wall grows down from the coronary band. Plenty of exercise will increase blood supply, allowing the laminae to stay healthy and strong, discouraging them from giving up and 'letting go'. Exercise on hard ground will encourage the heels to stay low and keep the toes rounded, preventing too much force pulling the laminae apart as the donkey walks.

Summary

It seems that most of the problems donkeys experience with their feet are the direct result of human intervention – either directly as a result of injury, or indirectly, resulting from failing to provide them with the environment they need to keep their feet, not to mention their minds and bodies, healthy. Perhaps it is time donkey owners led the way forward and take it upon themselves to step beyond traditional 'pasture maintenance' to something more like 'habitat creation' or 'adventure playgrounds' for their animals. If pastures were ploughed up and reseeded with 'low-quality' native grasses, fences replaced with hedges or stone walls, areas of hard-standing provided, possibly even 'climbing areas' planted up with native, non-toxic herbs, and thought given to layout so that the donkeys are encouraged to continuously play and explore their environment, surely we could teach the horse owners a thing or two? Perhaps a fenced off strip in the middle would encourage a 'track' to develop around it, and within the strip an area could be set aside for herbs, wildflowers and a small pond, providing an enhanced environment for wildlife, donkey and owner alike. Having taken donkeys from their natural environment and subjected them to the perils of civilization, surely it behooves us to do what we can to restore a suitable environment for them, and for us all!