Dealing With Laminitis

Horse Care

FEATURE

by HEATHER SMITH THOMAS

Laminitis simply means inflammation of the laminae—the tiny interlocking finger-like tissues that attach the coffin bone to the insensitive outer wall in the horse's foot. A common aftermath to laminitis is the breakdown of tissues that normally hold the bone suspended; then the weight of the horse forces the bone downward. Most cases of laminitis develop secondarily to an illness or injury such as colic, severe diarrhea, uterine infection, excessive trauma to the feet (road founder), abrupt changes in the digestive tract after grain overload or overeating on lush pasture. The trouble, in many instances is that by the time the horseman recognizes there's a problem (the horse becomes lame or uncomfortable), the damage is already occurring within the foot.

Scott Morrison (Rood and Riddle Equine Hospital, Lexington, Kentucky) says there are several theories on why laminitis occurs. One theory is the blood flow hypothesis—that decreased blood flow to the laminae may be a factor in causing the damage. Some recent studies have contradicted this, and researchers are still examining and measuring blood flow as a cause of laminitis.

There is also a theory that activation of certain enzymes within the laminae destroys the bond between the hoof wall and the coffin bone. Another theory is that an abnormality in which glucose can't be utilized by basal cells of the laminae affects some of the bonds, which are dependent upon glucose. These cells are unable to utilize glucose for some reason, as in horses with Cushings syndrome or diabetes-type syndromes (horses that are prone to founder), he says.

"There are also mechanical causes of laminitis, such as road founder, in which the laminae are over stressed. There are all these different theories about laminitis, and it's probably some degree of combination of several of these things that cause it. Every case is different," he says. A horse who gets laminitis from eating spring grass may have different factors than a horse with Cushing's disease, or a horse who develops road founder, or the mare with a retained placenta.

Treatment

"Usually by the time we see a laminitis case, the damage is already done. Much of the research is looking at ways to try to see it early and prevent it, but by the time a veterinarian sees a horse with lamintis, it's well into the acute or possibly the chronic stage; we are just assessing the damage and trying to find a medical and mechanical plan to keep it from happening again, and to repair the damage that has been done," says Morrison.

"We try to restructure these feet over time, and it can be complicated because every case is a little bit different. But there are several shoeing mechanics, surgeries and other things we can do to gradually realign the coffin bone," he says.

In the acute phase there is swelling and pain in the foot. "We try to keep the horse from entering the chronic phase. Once the damage in the foot has become significant enough that the laminar bond fails, the bone displaces or rotates—and the horse enters the chronic phase," he says.

"There are several ways the coffin bone can displace. Most common is that it rotates (front portion tips downward). It can also sink, which is more serious. Some sink straight down, but a few may sink on the lateral side (outside) or the medial side. Most of them (about 90 percent) rotate—so we treat them all in the acute phase to prevent this rotation, if possible," he says.

"The coffin bone is held in position in the hoof capsule with the laminae suspending most of the front region of the bone. The deep digital flexor tendon props up the back portion of the coffin bone. This region has a little more support. When the laminae are weakened, and the tendon continues to pull, this is what causes the coffin bone to rotate, with the front going down and the back being pulled up by the tendon," says Morrison.

"So we try to prevent the horse with weakened laminae from rotating. We do things to try to decrease the tension on the deep digital flexor tendon, such as using wedge pads in the early stages of laminitis. This lifts up the heel and takes tension off the tendon, so there is less pull at the back of the coffin bone (against the weakened laminae). We also use sole supports to load the sole, frog and bars and take the weight off the hoof wall and the laminar interface, to help protect the laminar bond."

While the horse is in the acute stage, all of these techniques should be done with temporary devices (things you can slip onto the foot), rather than permanent shoes. "There are shoes on the market that are helpful, such as a little wedged, cuffed shoe that can be taped on the foot. Everything you use should be put on as non-traumatically as possible. The hoof at this point is so unstable that often you may need to change what you've put on it. You don't want to be pulling nails out," he says.

You also want to do everything very quickly and efficiently. "The last thing you want to do is stress the horse during the acute phase; you need to keep him in a stall and not walk him around to a farrier. You want the farrier or the vet to come to the horse. Everything should be done quickly. You don't want the horse to be standing with his foot up for very long, or this will stress the opposite foot," he explains.

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Shoeing treatments must be done quickly, without moving the horse. A good analogy is that treating a horse with laminitis is like treating any other musculoskeletal injury. You want to immobilize the tissue (splint it and rest it) enough to prevent further damage so it can start to heal. "Our way of immobilizing the laminae is with sole supports and wedges to reduce movement, just like you would put a splint or a cast on a limb," he says.

Dealing With Chronic Laminitis

Once the horse enters the chronic phase, the veterinarian or farrier might use a number of ways to aid the foot, with different types of shoes. "Gluing them on is the best, since you don't want to drive nails into an inflamed hoof. We glue shoes on that give a lot of support—either a heart bar or sole support. We use a shoe that keeps the break over point very far back," says Morrison.

"My general guideline is that I keep the breakover behind the diseased laminae. If the laminae in the toe area are diseased, I try to keep the breakover behind the toe region. Looking at the foot from the side, I drop a plumb line from the very front part of the coronary band down to the ground, and try to keep the breakover at that point. If you keep the breakover back there, you've unloaded the majority of the diseased laminae," he explains.

"In most glue-on shoes, breakover is an important feature of the shoe, along with sole support. A third feature of the shoe is some type of heel elevation, such as a small wedge or something else—to decrease the pull of the tendon," he says.

"If there is a lot of coffin bone rotation, sometimes the shoeing mechanics are not enough to resolve it, especially in horses where the tip of the coffin bone has penetrated the sole, or a horse who just doesn't respond to the shoeing. With some of those, we go in and cut the deep digital flexor tendon (tenotomy), to take most of the rotational force off the coffin bone," he says.

Whether these methods work will depend on a lot of things, such as how long the bone has been rotated. "If the coffin bone has been left rotated and out of position for a long time, the tip of the bone may be damaged and infected. If there is a lot of infection or bone damage, the prognosis is poor for getting that horse walking sound again. But if we get to that horse early and the coffin bone is still healthy, prognosis is good for getting the horse pasture sound or ready for light use. I've had a lot of horses in which the bone had penetrated the sole, that we've seen early (and used the tenotomy) that people are riding again." Getting to them early and treating them effectively can make a big difference in the outcome. Once they get a lot of bone disease or bone damage, this is a chronic source of pain.

"In chronic cases, in which the coffin bone has rotated out of position, in our shoeing mechanics and tendon treatments our goal is to relieve compression of the sole beneath the coffin bone and get the horse to grow more sole in that region. The sole tissue in the toe region becomes very thin where the

bone is compressing it, so this needs to be resolved. We can eventually get the horse to grow more sole in the toe region and get the coffin bone back into its normal relationship with the ground. We monitor these horses with radiographs at each shoeing to make sure we are gaining sole and decompressing that tissue," says Morrison.

"Once a horse has had chronic laminitis, the laminae are never as strong as they were in a healthy foot. They are compromised, so for the rest of the horse's life you may have to use some kind of special shoeing to give him easy breakover or sole support."

If laminitis was caused by a digestive tract problem (grass founder, grain overload) you need to be careful in how the horse is fed. If a horse is an easy keeper you must be careful at certain times of year if he's at pasture. Spring grass should be avoided, or any fresh grass that regrows after a drought or fall rains. Anything lush and tender, or stressed grass (after a frost) may have a higher sugar content, and can be dangerous.

"Someone told me that when they are picking grapes for wine, if they want it to be very sweet, they pick at times of the year such as after a frost or when it's been stressed, to get that high sugar content. Grass is the same. We recommend people keep their horses off pasture at those times, especially if a horse has had problems in the past," he says.

"Some grass hays can be very high in carbohydrates. There can be differences, depending on species of grass, the time of year (or stage of maturity) in which it was cut, growing conditions, etc. Recent studies have shown you can decrease the carbohydrate levels in some hays just by soaking them in water, because the sugar is soluble in water. So if you have a horse who has a problem with sugars, this can help. Soaking the hay can decrease the sugar by a significant amount. Just looking at the hay or smelling it won't give you a clue as to its sugar content. If there is any question about it, the cheapest and easiest thing to do (rather than have it tested) is to soak it in water before feeding it," he says.

A horse who is prone to founder should be fed little or no grain. At the same time, you want to make sure they get all the minerals and vitamins they need. "Sometimes we recommend feeding a vitamin/mineral mix along with the hay ration, to make up for what they are missing in grain, and use hay that's been soaked in water. Some feed companies have specially formulated feeds for these horses. Purina has a product that addresses these problems—a feed that's low in carbohydrates but still has all the vitamins and minerals the horse needs. This can be an option if your horse needs the extra calories. Some horses, like those with Cushings disease, have a hard time maintaining body weight," he explains.

If a horse is hard keeper, a feed that has more calories in the form of fats or oils may be helpful. Feeding fat supplements can be an option for horses who are at risk for laminitis, providing the extra calories in a safer form than sugar. "It's the soluble carbohydrates that are really dangerous (in grain or lush grass)," he concludes.