



HEALTH ZONE

Chronic Founder

BY HEATHER SMITH THOMAS

Laminitis, Part II

(part I appeared in the Aug. 8 issue)

Dr. Scott Morrison, a veterinarian/farrier at Rood & Riddle Equine Hospital in Lexington, is often called upon to care for and shoe foundered horses.

“The ones I generally see are horses that have been chronically foundered for a long time and the owner wants to know how best to shoe the horse to get the coffin bone back into normal position again,” he said. “The ones that have rotated but are still growing sole and wall can be helped over time by getting the bone back into position and normal alignment. Normal alignment is about 0 to 5 degrees—the angle the coffin bone makes with the ground. Our goal is to get the horse back to a normal angle and normal amount of sole depth.”

With many chronic founder cases, the horse’s heel grows faster than the toe. (For a look at early treatment of laminitis and the acute phase, see the Aug. 8 issue of *Blood-Horse*.)

“That is probably the hoof’s way to try to fix the imbalance between the health of the laminae and the pull from the deep flexor tendon,” said Morrison. “It’s almost like the foot is making itself a little wedge by growing more heel.”

Many horses get around all right but are still a little sore because the coffin bone is out of alignment. They often have a very thin sole, and the front of the coffin bone is right above the sole with very little cushion between it and the ground. These horses may do fine on soft footing, but they quickly bruise and go lame on hard or rocky ground.

TRIMMING AND SHOEING

“There are different ways to help these horses,” said Morrison. “Often it’s a balancing game, decreasing tension on the deep digital flexor tendon. When you look at the foot, your logical reaction would be to trim down the long heel. You look at the radiograph and foot and want to trim the heel, and take some of the front of the toe off, where it’s not parallel to the bone. But if you trim the heel too much, this puts more tension on the tendon and makes the coffin bone rotate more.

“Our rule is to trim for balance, shoe the

horse to decrease tension on the tendon, and provide support. We do trim the heel a little, but whatever we take off with the trim, we usually replace with a wedge on the shoe. It seems redundant—to replace what we take off. But what this accomplishes, rather than having the weight right on the tip of the coffin bone, is having more shared weight distribution along the whole bottom part of the coffin bone.”

An analogy would be like a person standing on tiptoe.

No One Shoe Fixes Everything

“The angle of the bottom of the foot to the ground would be about 45 degrees, and all the weight is concentrated on the toe,” said Morrison. “If you place that person’s foot on a board, then tip the whole board 45 degrees, the foot is still 45 degrees to the ground, but the weight is along the whole bottom of the foot, relieving pressure on the toe. So you trim the heel down, but replace it with a wedge. Also, when you trim the heel, the foot can bear weight farther back.

“We trim the heel, then design a shoe with a heel wedge or elevation that provides at least as much or slightly more than what we took off. We also try to get the horse to breakover fairly far back. Looking at the foot from the side, I drop a plumb line from the front of the coronary band to the ground, and try to get the breakover right there—which is near or slightly behind the apex of the frog. You want the breakover to be behind the diseased tissue at the toe, to put less stress on the laminae.

“That point—the line down from the front of the coronary band to the ground—is also the horse’s center of pressure. When you put a horse on a force plate, it will show that this is where the most pressure is, on the foot. If you can get the foot to break over there, you take a lot of stress off the foot.

“We roll the sides of the shoe as well, so the foot can breakover to either side easier when turning. We add support material under a pad or a heart bar or a plate in the

bottom of the shoe so we can fill the back half of the foot with silicone or putty to take stress off the laminae.

“You must be careful which structures you load. Sometimes a horse will be sore in the toe, and you don’t want to load a structure that’s sore.”

The shoe can be made out of anything and doesn’t need to be fancy.

“You can use an aluminum shoe with a wedge pad and a rocker toe,” said Morrison. “Some people use a wooden clog shoe. You can cut a piece of wood and trim it to meet your requirements, then glue it onto the foot. This is easy and cheap. When you know the basic mechanics needed, you can use any shoe or whatever is available and modify it to treat the foot.

“You generally want something relatively soft on the bottom that won’t generate a lot of vibration. Wood is good for this purpose because it absorbs a lot of concussion. Before any of these new shoes were available and before we had the idea of using wood, I’d cut up rubber stall mats and rivet or screw those pads onto the bottom of an aluminum plate. This created a plate shoe with a rubber bottom, and horses really liked that.”

No one shoe fixes everything.

“The important thing is to understand the mechanics of the foot and the forces at play that you need to combat,” said Morrison. “Then you can create something that will work for that particular horse.

“You are trying to increase sole growth and sole depth under the tip of the coffin bone. I radiograph the horse every time I shoe him, every five to six weeks, to check progress. We also look for new growth rings coming down from the coronary band. You know a foundered foot is balanced when it grows an even hoof wall and the new set of growth rings are parallel and not wider at the heel than at the toe.”

Not everyone has access to radiographs, so it’s good to read the growth rings. Hoof growth and sole depth usually go hand in hand. Once the sole grows enough to protect the foot, the horse is more likely to stay sound.

The special shoes help change the growth pattern of the foot.

“You are speeding up toe growth and

slowing down heel growth—taking a lot of stress off the tendon,” said Morrison. “Over time, as sole depth increases, the sole at the toe will match the sole depth in the heel area. Then the coffin bone is realigned and parallel to the ground again.”

You don’t force the realignment by trimming. Instead, you realign it by changing the way the hoof grows.

“You can trim the heel back and take a radiograph and say it’s fixed, but the horse will just get more sore,” said Morrison. “If the foot grows that way by itself, however, then you know the foot is truly balanced and rehabilitated.

“Once the bone is back into alignment and the growth rings show this, I usually keep the horse in that kind of shoe until the new growth has come at least halfway down the wall before I try to scale down the mechanics.”

At that point he uses a little less wedge.

“Usually, those horses always need to stay in some kind of shoe or trim that eases breakover. If the horse is barefoot, you have to keep trimming so the break-over is right under the coronary band. Even though the horse grows a whole new

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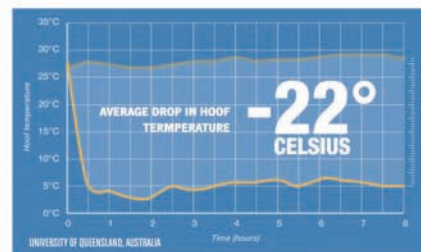


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foot and the coffin bone is back in alignment, the laminae are never quite as strong again. You need to baby that foot, easing the breakover to reduce the stress.”

Morrison suggests having radiographs taken a couple of times a year to check sole depth and to make sure the coffin bone stays in alignment.

“If it starts getting out of whack, you may have to go back to adding slightly more mechanics to the shoe in the form of a little wedge or more support,” he said.

“A lot of these horses will go back to high levels of athletic competition, even though the laminae remain somewhat compromised forever. I’ve had racehorses that have gone back to winning races and some hunter/jumpers, dressage horses, and polo ponies that go back to their previous level of work. You just need to watch them and keep them shod properly—and pick up on little things before they become big problems.”

CHRONIC UNCOMPENSATED FOUNDERED FEET

Some of the more serious cases require tenotomies, where the deep digital tendon must be cut.

“Some horses’ feet have the wall completely separated and pinching the coronary band,” said Morrison. “These need part of the wall resected.

“Tenotomies have gotten a bad name in the literature over the past years. A lot of the studies, when they do deep digital tenotomy, never mention how the horse was shod or trimmed afterward. The shoeing is crucial to make a tenotomy work.

Statistics on horses’ recovery in cases where the coffin bone comes through the sole have been poor. Most people say that a horse whose bone comes through the bottom of the foot has no hope for recovery.

“We have done more than 300 tenotomies in our practice. Looking at all our cases for a study, we put them into categories—the ones in which the coffin bones had penetrated the sole, and the ones that didn’t, and the amount of bone disease they had.

“We followed these horses for a couple of years, and they had to be at least pasture sound for a year before we consider it a success. Eighty-eight percent of our cases that had penetrated the sole became pasture sound after a tenotomy, with special shoeing. So our statistics are a lot different than some of the other studies.

“We shoe them a certain way, after we cut the tendon. The biggest limiting factor for long-term soundness on a foundered horse is health of the coffin bone. If the coffin bone stays healthy, most of these horses do well, long term, even after a tenotomy.

“In a foundered horse, if the bone is left out of position and the foot is not growing sole, the tip of the coffin bone starts eroding away, suffering bone damage. Once the horse starts losing the tip of the coffin bone, this becomes a continual source of pain.

“As long as the coffin bone stays healthy and well padded with enough sole, these horses can usually be rehabilitated—even the ones where the bone has come through the bottom of the hoof. If we can get to them quickly and treat them before the bone be-

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comes eroded, they do fairly well. We've had some recover enough to go back into work and lower-impact athletic careers.

"Bone damage is what you want to prevent. The coffin bone is the foundation for the whole hoof. If the horse doesn't have a good foundation, he can't grow a good hoof.

"When we did our tenotomy study, of the ones that had badly damaged coffin bones, only 44% of those horses did well—becoming pasture sound or better after a year. But as long as the coffin bone was still healthy, our success rate with tenotomy was around 85%—for all uncompensated cases that were unresponsive to shoeing alone.

"After we cut the tendon, we glue a shoe on that's perfectly parallel to the bottom of the bone (for sole support). So it involves wedging up the toe. After cutting the tendon, you don't have to worry about putting more tension on the tendon while you are putting the coffin bone back into normal alignment because it's been transected. The cut ends of the tendon will heal over three to four months. There will be a little scar tissue, but it can be quite functional."

Some horses' coffin bones sink rather than rotate—the whole bone drops, or sinks, on one side or the other.

"The horses that sink need a different type of shoeing," said Morrison. "Instead of wedging them up, we keep the coffin bone flat and use a foot cast. This helps decrease the shear force on the laminae in the heel and quarter on the side that dropped."

Sometimes Morrison will make a horizontal groove in the wall beneath the coronary band on the side that sinks and then put the hoof in a foot cast.

"If you palpate the coronary band on that side, it will have a cavity where the bone has sunk under the hoof capsule and pulled on the skin. Once there's a depression, it damages the coronary band in that region and it won't grow hoof wall on that side."

The grooving will often restore hoof-wall growth.

"Sinkers have a poor prognosis," said Morrison. "In horses we've followed at our clinic, only 18% were successful. Most studies show only five to 10% success. If they rotate, you can always try to do things to shift the weight to the heel with wedges, or cut the tendon. But when the bone sinks or goes down on one side, it's more difficult because there's no way to shift the weight—you are trying to fight

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The many ways to deal with laminitis and founder give horses more hope

today than they had 20 years ago. Many people still think that once a horse's coffin bone has penetrated the sole, they have to put the horse down. But this is no longer true.

"The horse may not be an athlete again but has a good chance to recover well enough for breeding or good quality of life at pasture," said Morrison. "The owner needs to get a specialist involved, however, to make sure there will be good chance for success." 

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