

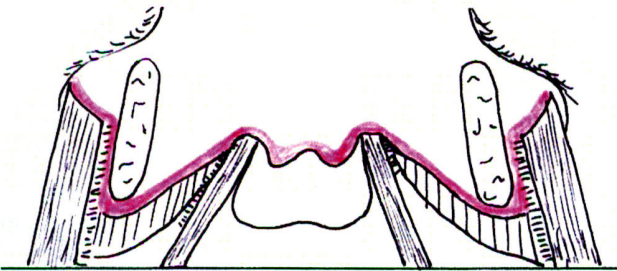
BAR CONTRACTION ("NAVICULAR SYNDROME")

*From "The Hoofcare Specialist's Handbook:
Hoof Orthopedics & Holistic Lameness Rehabilitation"
by Dr. Hiltrud Strasser and Sabine Kells*



If the bars are very long, especially if they are on the same level as the wall even when the hoof is non-weight-bearing, they prevent the solar vault from drawing flat during weight-bearing, like pillars or a wall carrying a roof. As such, the bars bear weight long before they are meant to, and this damaging pressure is directed into the hoof, bruising bar and sole corium. The situation

is compounded if the heels are long, and lever the bars up into the interior of the hoof. The hard edge of the bars forces the sole upward against the area between the frog and sole corium (the inward-turned coronary corium, which forms the bars) even more.

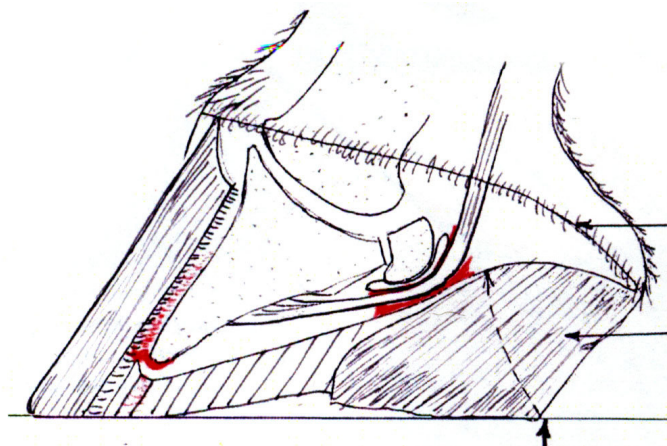


Long bars prevent solar concavity from decreasing on weight-bearing, reducing hoof mechanism and bruising the corium above them.

When the hoof bears weight, the deep flexor tendon and navicular bone region descend against this area (which can no longer draw flat because the bars keep the solar vault high). As a result,

the corium here is pinched between the sharp edge of the sole pushed high by the bars, and the deep flexor tendon and navicular bone, and may become inflamed. The resulting pressure also pinches shut the arteries supplying the frog, and irritates the flexor tendon, navicular bursa, etc. This is similar to the bruising of the sole by the descending coffin bone when the sole cannot draw flat. The pain from inflammation in this region is usually diagnosed as "navicular syndrome". If the heels are high enough, the digital arteries are also pinched shut due to the excessively steep alignment of the foot bones.

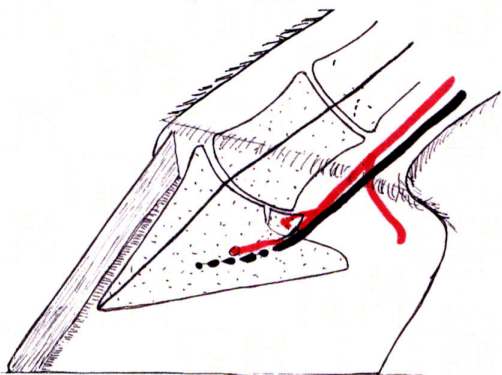
The congestion which results from the digital arteries being pinched shut causes the blood vessels above the constricted place to enlarge, and the bone around them is destroyed (bone responds quickly to pressure). Even though it has been known for twenty years that the enlargement of the cavities in the navicular bone has nothing to do with "navicular pain" (the deconstruction of bone is not painful, whether navicular bone, coffin bone, or human bone), these enlargements are still being cited as the causes for lameness in "navicular" horses, and not infrequently a horse is condemned to death for such bone changes. Sometimes these are even misdiagnosed as mysterious cysts



Unnatural forces on sole:

- *Frog and bar corium due to long heels and bars:*
- *The coronet is levered up;*
- *Long heels lever the bars and sole up into the foot;*
- *Contusions at the tip of the coffin bone due to overloading from excessive steepness become visible in the sole horn as bruising.*

inside the bone, and thus take the blame for the lameness. Or, alternately, the navicular bursa is considered to have dried out or worn away, or the tendon to have become ruptured or attached to the navicular bone. The imagination at work in finding a cause for navicular pain is seemingly limitless, and new theories are brought forth every day, only to be contradicted by the next one.



Unlike in a physiologically shaped hoof, in a high-heeled hoof, especially one with long bars, the digital arteries are pinched shut between the deep flexor tendon and the palmar processes and the descending navicular bone even with moderate weight-bearing (such as standing); a normal situation is not even possible. Blood supply to the frontal lamellar corium is disrupted, which is why the horse cannot feel the damage done in it from overloading due to excess heel height (rotation) or incipient separation. However, the branch of the digital arteries supplying the bulb/frog/bar region is not affected by this, so a horse even with high heels can very clearly feel the pain from bruising in the bar or navicular region.

In reality, the matter is quite simple. The pain is due to the bruising and inflammation of the corium as a result of the unnatural forces exerted on it by long bars, especially when levered inward by long heels, in other words: bar contraction.

Long bars pull on the solar corium and may even tear it away from the bar corium as the bar is pushed upward and inward toward the midline of the frog. Hoof canker can occur at this stressed corium area, but in any case there is bruising, inflammation, and pain (“navicular syndrome”).

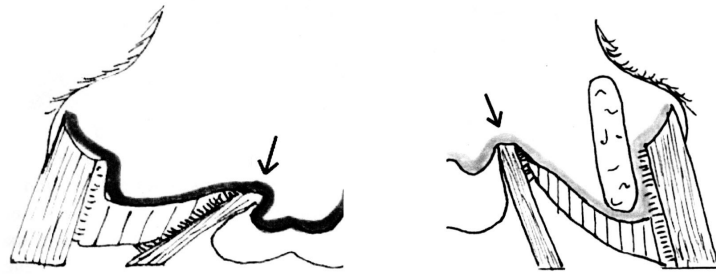
This pain is present even while the horse is “pointing”, ie. when the navicular bone/deep flexor tendon is not sinking down toward the inflamed region, though the horse may not feel the pain for some time until the damage has progressed to an area with sufficient blood supply (from a higher branch of the digital artery).

The damage can occur when the bars are standing upright, or lying flat on the sole. If they are flat, they force the sole toward the frog, and often into and under it, contracting the frog without actually increasing the solar vault. Rather, the sole is flattened out, while being deformed toward the midline, and the frog is often far narrower at its base than the volar surface.

If the bars are standing upright, or are levered into the hoof through high heels, they force the entire solar vault higher. It is important to realize that the bars do not have to have ground contact: they can be forced into the interior of the hoof by the lever of long heels, and thus do the same damage.

Obviously, the damage by excessively long bars is somewhat decreased when the horse lives on very soft ground, where the bars can sink into it rather than be forced up into the hoof. Conversely, the situation is aggravated if the horse is moved on hard ground, for then the movement of the sole is restricted even more, and the bruising of the solar corium is greater. If the bars are left too long, especially if lying on the sole, areas of solar corium can become necrotic and abscessing results to remove the dead tissue. A similar situation of corium damage and bar contraction exists if part of the bars contacts the shoe (as, for example, with eggbar shoes, or even with shoes whose heels are turned in to prevent the horse from stepping into the shoe and pulling it off). If this is the case, movement of the sole is also restricted more, and less circulation makes for less sensation in the foot, which is why “navicular” horses seem to improve for a while when shod with bar shoes. (In the old days, a shoe was made wider than the hoof in the area of the heels, and the bars did not touch the shoe).

Bar contraction is also the cause for thrush. Since the arteries and veins supplying the frog with blood are located on top of the edge of the bars, and are pinched shut by long bars, frog horn quality and quantity is reduced. The decomposition of frog horn through dryness and bacteria, a steady rate, then exceeds the (decreased) rate of horn production. Since the sweat glands are also located in the frog corium above the edge of the bars/sole, they, too are unable to function properly (or not at all). The acidic environment cannot be maintained, so bacteria, which live in an alkaline environment, can take over and decompose the frog. The result is thrush.



Long bars pull on the bar/sole/frog corium and cause bruising and even tears in the corium, resulting in pain and inflammation. This can occur when the bars are upright (right) or lying down (left), when they have ground (or shoe) contact, or are "only" levered upward by high heels. Tears between bar and frog corium are more common if the bars are upright; if they are lying down, the tear is more likely to occur between bar and sole corium.

If this is treated conventionally, with desiccating and toxic substances for a long time, the frog becomes dry and brittle and can easily crack. Bacteria can then enter into the corium, and an infectious abscess can result. Hoof canker is also a possibility at this stage.

A frog well supplied with blood is not harmed by wet conditions (the conventionally believed causes of thrush); neither can thrush be permanently healed in any way but by trimming the bars to their proper place, widening the contracted hoof, and restoring normal blood supply to the frog corium. Ideal living conditions, including movement on appropriate terrain, are as vital as correct trimming.

Similarly, there is a connection between a condition similar in appearance to "mud fever" or "scratches" and circulation in the hoof, where the thrush seems to have crept up past the bulbs. This, too, is caused by a lack in circulation as a result of insufficient hoof mechanism.

Due to the common misconceptions about bars, they are often left far too long, even to the point where they grow to cover part or all of the sole. The pain from bar contraction is a common culprit when an owner decides to remove the shoes because he or she realizes that it is healthier for the horse to go barefoot. However, because the bars are frequently not shortened sufficiently during the trim (especially since most farriers believe they must leave "more" foot on a horse that is to go barefoot), the horse, as a result of the ensuing corium bruising and pain, "can't walk" without the shoes, or is lame on hard ground. Improper bar length is, of course, only one possible reason why the horse might be tender, but it is one of the most common reasons why horses are deemed to be unable to get along without shoes.

Neurectomy and/or Euthanasia

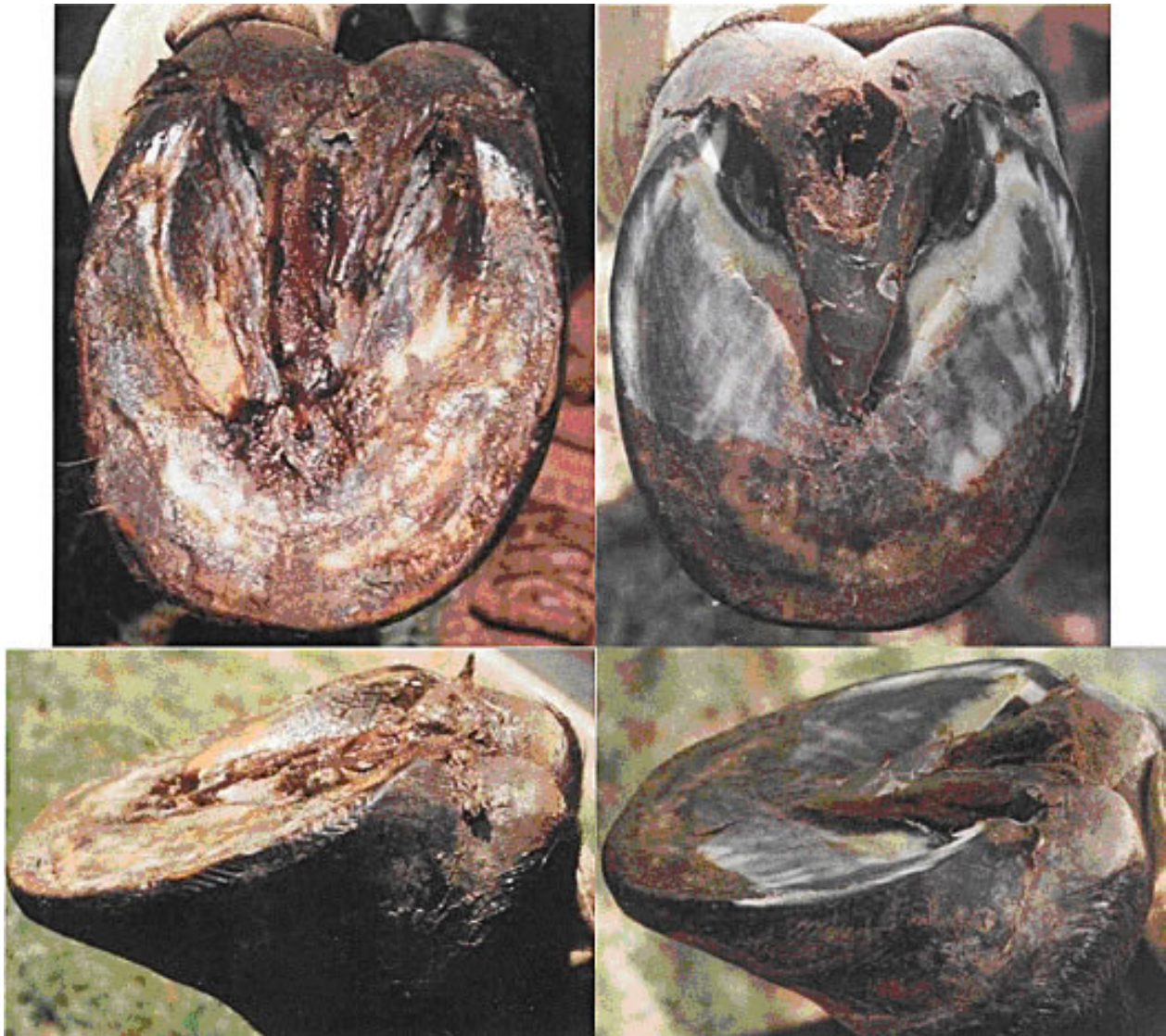
In conventional circles, nerving is a common last resort for "navicular" horses to restore them to usability for a little while longer after every other treatment has failed. Sometimes, this procedure is effective in achieving its goal for some time; other times, it is not. In any case, it is a temporary solution, since once the severed nerves into the foot regrow, it is conventionally accepted that the horse must be put down.

Widespread misunderstanding and/or complete ignorance of the causes and effects of contraction lead to an inability of conventional veterinary and farrier sciences to heal problems such as “navicular syndrome,” poor hoof quality, extreme white line problems, chronic founder, coffin bone rotation and protrusion, etc. After often long-term (and expensive) conventional treatment has failed, the horse is pronounced incurable and is put down.

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Left: farrier-type trim for barefootedness. The horse is unable to trot on hard ground (such as pavement) due to pain from the excessively full sole and long bars, which are level with the wall and have reached the tip of the frog.

Right: same hoof, correctly trimmed, with a properly concaved sole, and bars ending at the midpoint of the frog and well below wall level.