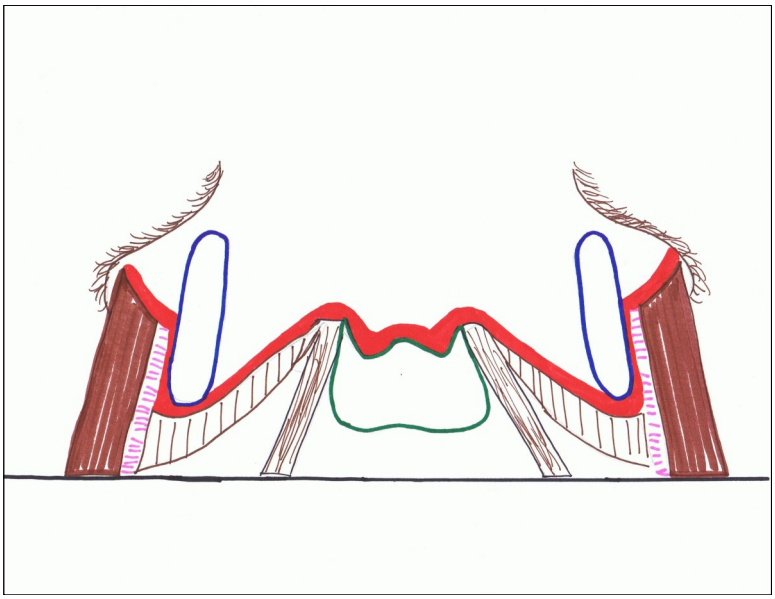
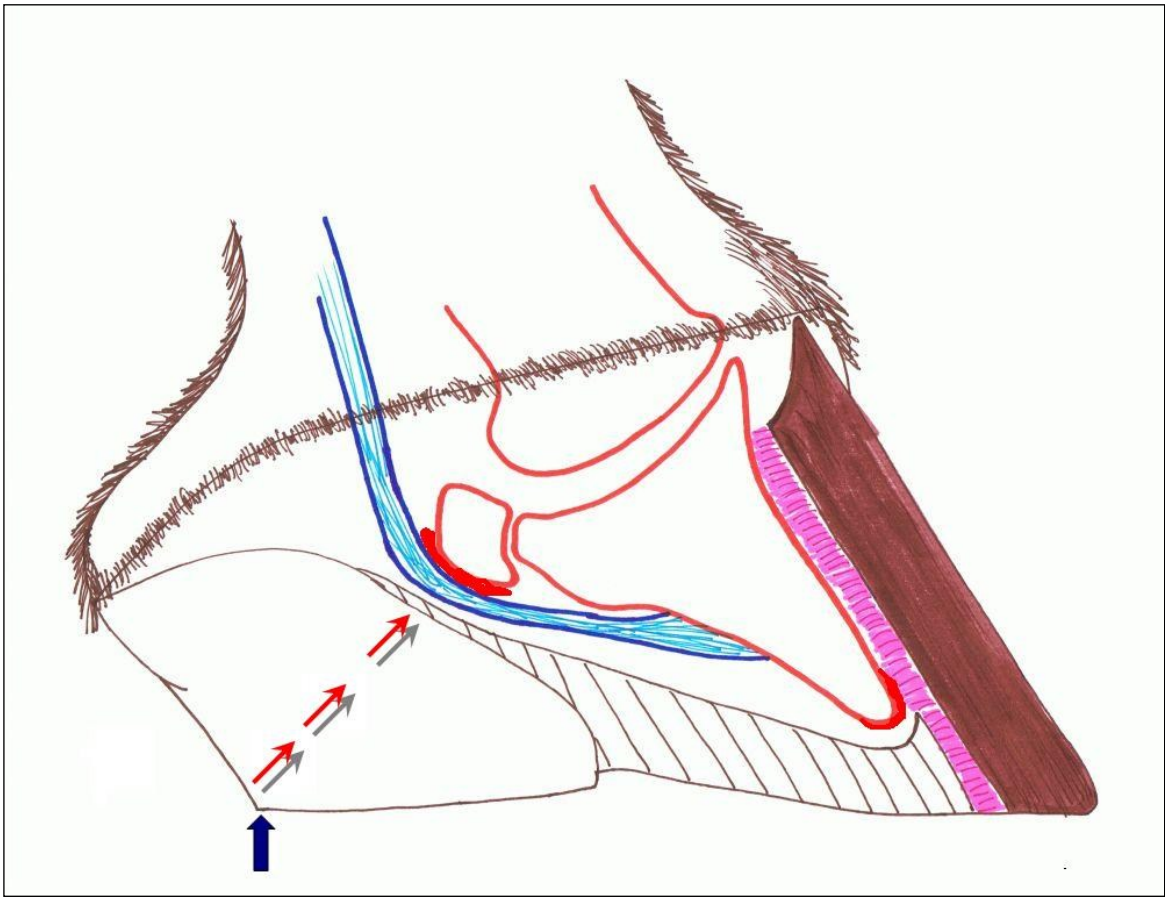
Bar Contraction (Navicular Syndrome)

Long bars, often at the same level as the walls are known as bar contraction. Long bars prevent the solar vault from drawing more flat during weight bearing. Bar and sole corium become bruised.

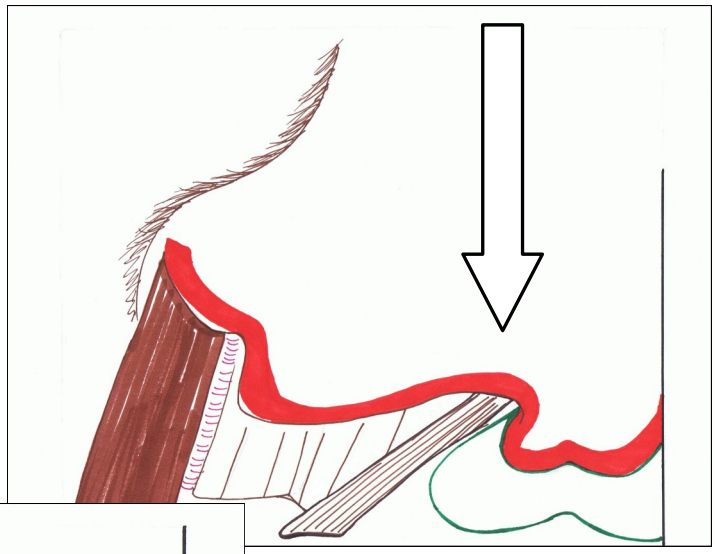


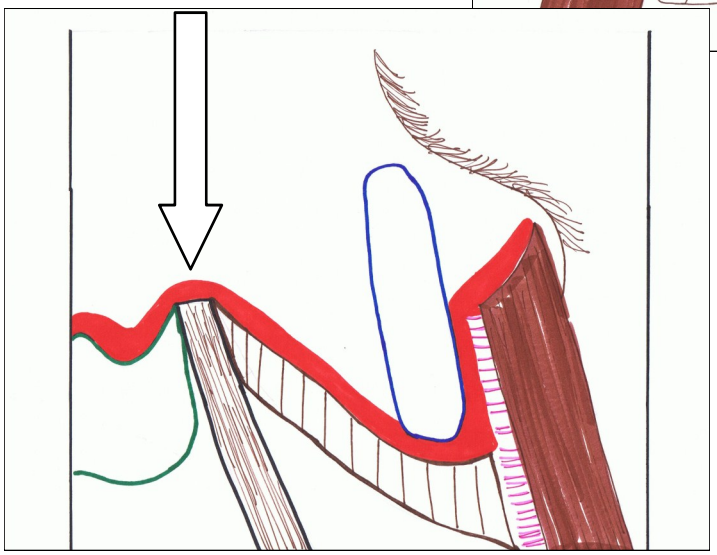


Unnatural forces apply pressure to the sole, frog and bar corium due to long heels and bars. The coronet is levered up.
High heels lever the bars and sole up into the foot. Areas of "navicular" pain and damage to the laminar and solar corium are shown in red.

Below: Solar view of hoof with high bars – bar contraction – and after trimming bars to correct height.

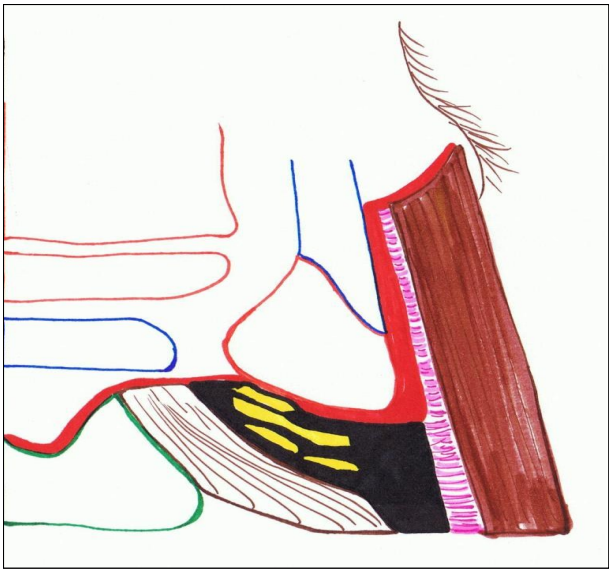
Long bars push and pull on the bar/sole/frog corium and cause bruising and even tears in the corium resulting in pain and inflammation. This can occur when the bars are lying down



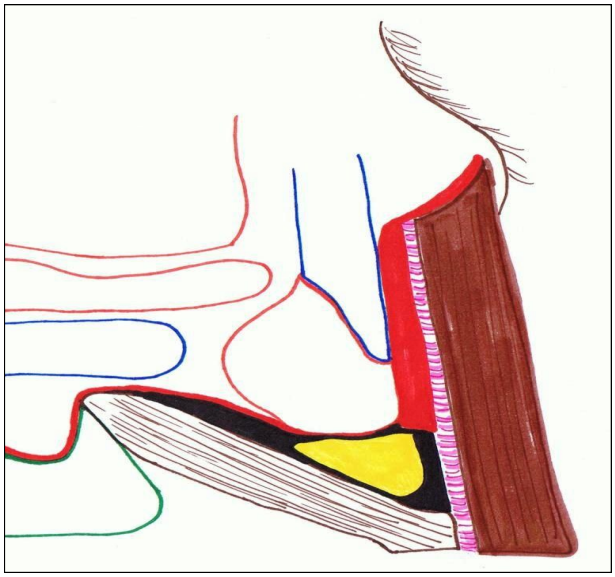


or when the bars are upright.

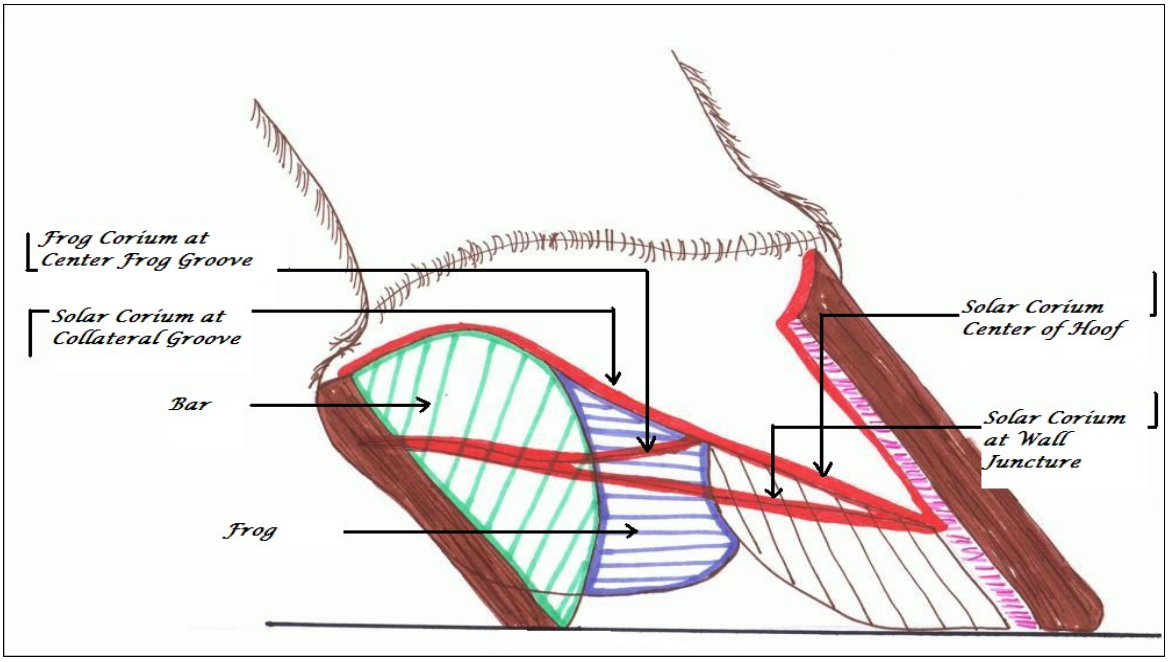
Full sole and high bars cause painful bruising of the solar corium. Parts of the solar corium die off.



Underneath the overlaid bar no more sole horn is being formed. With a correct trim one will only find corium or very thin sole in this area.



Here pockets of destroyed solar corium can be seen. The solar horn cannot grow out to be worn away.

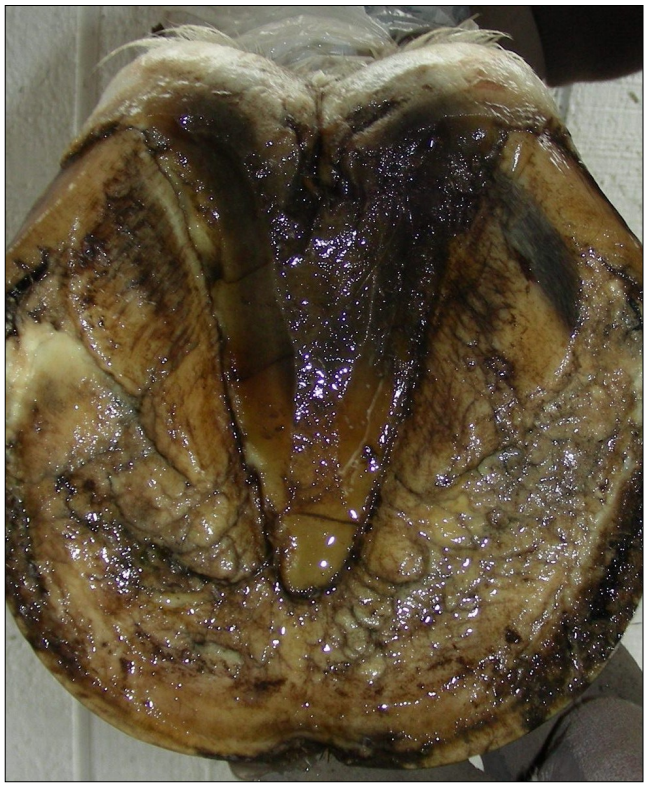


When the hoof becomes weight bearing the high bar pushes against the solar corium, the deep digital flexor tendon, the navicular bursa and the navicular bone, causing inflammation and pain in that area = navicular syndrome.

Above: Schematic side view. Frog is shortened because the sole is levered up. On weight bearing the sole gets further levered up. This is a painful situation in which the horse will seek relief by bearing weight primarily on the toe. If the bars are left at the level of the walls, this may result in "navicular" pain.

Very upright bars left at sole level (in conjunction with high and contracted heels)

Bars left long enough to cover part or all of the sole, resulting in a "double sole".



Causes for Bar Contraction

High heels allow the bars to grow too long
The sole is too full

Physiologically incorrect trimming
Terrain to soft
Insufficient movement

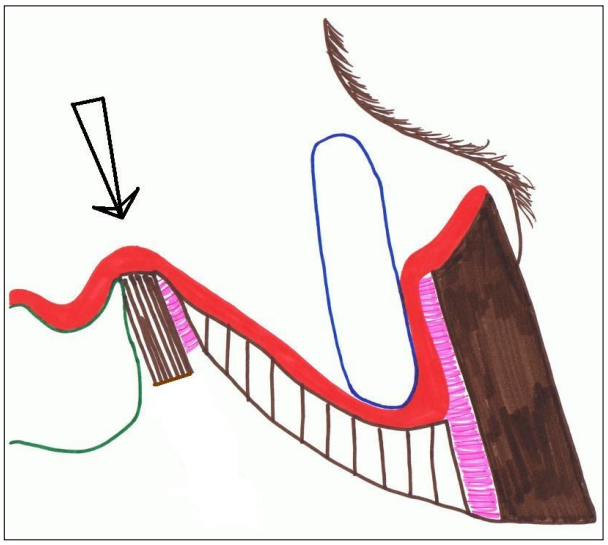
Trimming for Bar Contraction

Repetition: From the apex of the frog go back to about half the length of the frog. This is where the bar should start. Do not trim in the crevice between the bar and the frog. This would weaken the bar. The volar concavity does not only diminish towards the sides during weight bearing, but also to the front and back. The whole hoof becomes flatter. This is important to remember when we trim the bars. In a hoof with bar contraction the bar-producing corium is inflamed as a result of too much pressure. Inflammation leads to increased circulation and increased horn production.

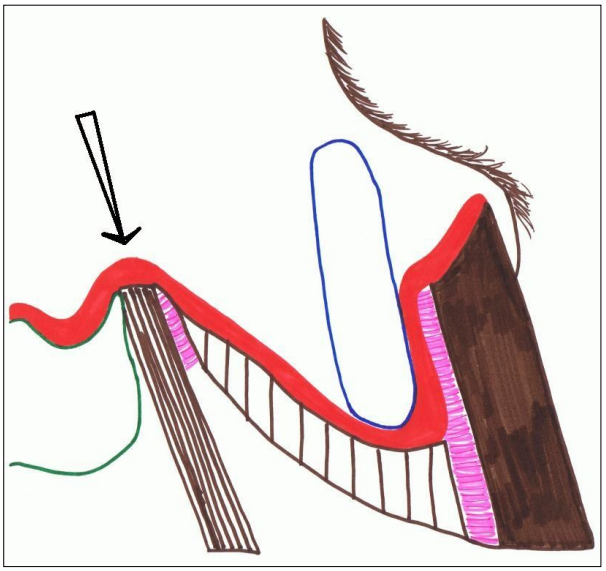
So in the beginning the bar grows much faster than in a healthy hoof. Check after 2 -3 days again and shorten the bar again. Horn growth does not occur evenly in all parts of the hoof.

Bar Contraction is not only responsible for "navicular syndrome", but also for "thrush", as it diminishes the healthy circulation to the frog.

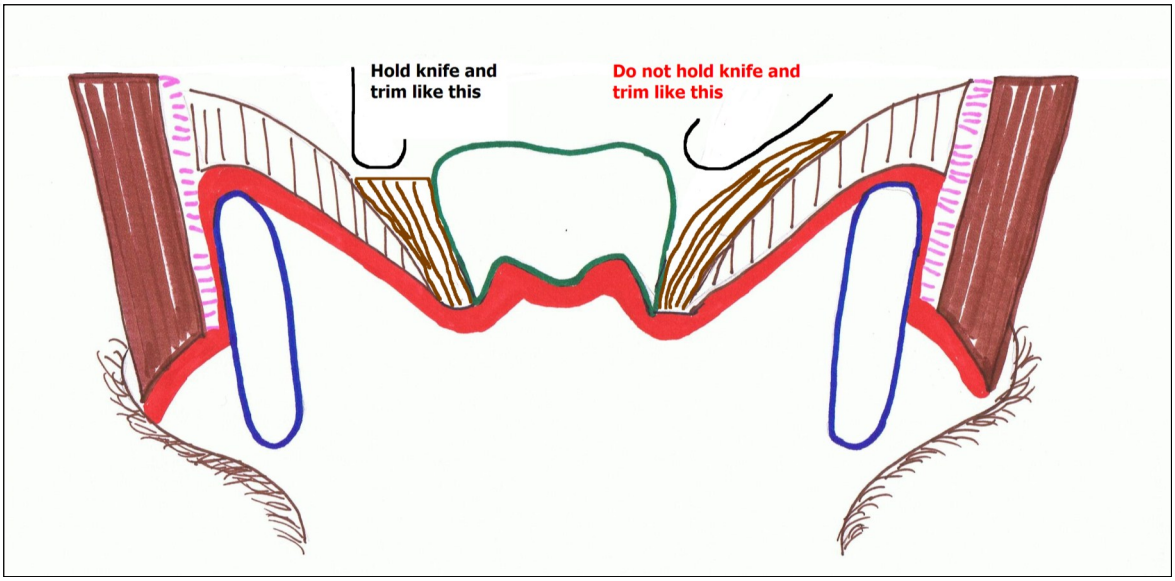
Make sure that you trim the top edge of the bar so that it will meet the ground flat during weight bearing.



Here the bar is so long that it pushes the solar corium onto the deep digital flexor tendon, the navicular bursa and the navicular bone, causing inflammation and pain in that area = navicular syndrome. In order to relieve this pressure and facilitate hoof mechanism, you may have to do more than shorten the bar. You may have to over-shorten it.
Over-shortening does not mean "digging it out". Just trim it a little (2 -3 mm) shorter than you usually would and then check on the progress soon again. Remember, you want to keep the overall structure of the hoof intact to avoid unnecessary pain through over-shortening.

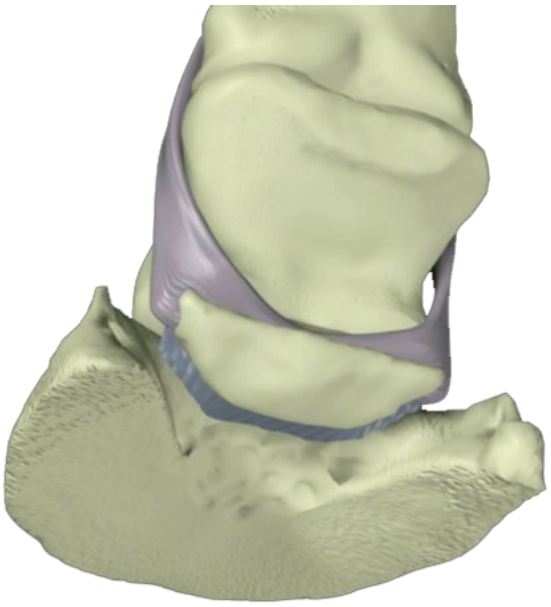


It is usually the upright bar that causes the pain associated with “navicular syndrome” or “caudal heel pain”.



When trimming the bar off the sole, use the hook of your knife to peel the bar back from the sole, careful to trim the bar always from the sole side.

Once you have trimmed the bars, heels and sole correctly, the inner structures of the hoof can relax again, the hairline will straighten out and the hoof capsule will be able to flex again. The horse will start putting weight onto heel area again after the inflammation has subsided. This may take a while, maybe even more than one trim, depending on the severity of the previous contraction.

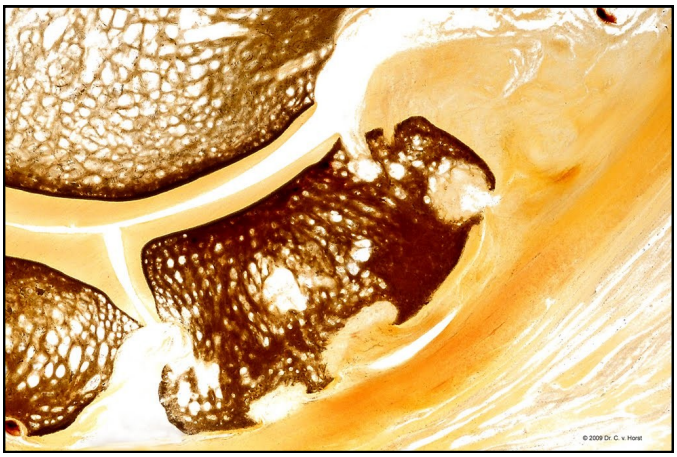


No matter how well you trim, you may not always be successful with this application. If the bar contraction has existed for a long time and the inflammation has been masked with pain killers and/or "specialized" shoeing in order to "use" the horse, there may be adhesions in the ligamentous area of the navicular bone that have progressed too far to be remedied with trimming. In such a case it may be impossible to return the horse to full performance. He may however live a reasonably good life in the pasture. As so often, acupuncture, bodywork and other complimentary modalities may help greatly to improve the horse's comfort.

In this empty hoof capsule you can clearly see the high pushed bars on both sides of the frog. Lowering the bars allows the corium to regenerate and heal – provided there is enough movement and therefore circulation.

Here you can see how far reaching a high bar really is. The frog was removed in this cadaver foot. Showing the bar pressing onto the deep digital flexor tendon.

Over time the navicular bone will become porous, decalcified, due to diminished blood supply to the navicular region, caused by high bars.



Pictures courtesy of The Glass Horse-Distal Limb, Dr. Hiltrud Strasser, Dr.vonHorst, Dr. John Stewart, Anne Coley. Drawings r.j photography