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Overcoming Palmar Hoof Pain by Supporting and Stabilizing Collapsed Heels

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Typical palmar hoof pain localized to the hoof capsule will usually result from a combination of an inadequate hoof capsule, hoof wall failure, and continuous concussion on these compromised structures, leading to overload. Successful treatment and thus the elimination of pain are achieved by improving the palmar section of the hoof capsule. It is often necessary to artificially restructure the heels. Collapsed heels will often be the greatest challenge to hoof care providers. Author’s address: PO Box 66, South Amboy, New Jersey 08879; e-mail; ihmckinlay@gmail.com. © 2010 AAEP.

1. Introduction

Palmar hoof pain is a common occurrence in many horses that are required to perform daily in some type of rigorous activity. It is the author’s experience that this is often caused by poor hoof wall integrity, farriery practices, daily hoof care, and hard surfaces. In North America, the horse racing industry’s predominate choice is a stone dust–based race track, the show horses generally show in firm synthetic riding rings, and the western world has to deal with concrete show grounds, coining the term, “concreteitis.”

More problematic is the structure of the hoof wall itself. Thin walls through the quarters and heel section of the hoof capsule are commonly at fault. Complicating this problem is excessive use of water because of foot soaking, bathing, and packing the hoof daily with poultices, which makes the hoof wall soft and more pliable. Pliable thin walls often cause the heels to collapse under the horse’s own weight. As the heel collapses, the wall will usually fold under and forward. This decreases the ground surface of the foot and moves the point of contact with the ground forward. As the heel horn tubules collapse, their point of contact in the heel of the shoe moves forward leaving the bulbs with no support (Fig. 1). A collapsed heel should not be mistaken for a short or low heel because the horn tubules are not short in length but have lost their angle and become more parallel to the ground surface. The amount of hoof wall deterioration at the quarters of the hoof capsule and how much of the hoof wall rolls over onto the sole will dictate how much sole pressure there is. Collapsed heels will ultimately result in that hoof being short shod with a smaller shoe, which usually results in a long toe, low heel configuration frequently observed at the race track (Fig. 2). This stress to the hoof capsule may also cause the walls to flare out through the quarters of the hoof capsule. Once the structures in the heel are damaged and the hoof capsule is distorted, the approach to shoeing will generally determine the overall soundness of the horse. Trimming, shoe choice, structural adhesives, daily hoof care, and training schedule will all play a role in managing palmar hoof pain.
The amount of palmar hoof pain is often related to the conformation of the hoof capsule, thickness of the wall, amount of hoof growth, width of the shoe, overall weight of the horse/rider, and the speed that the horse travels over any firm surface. Any one or combination of these factors will usually result in excessive sole pressure that will cause inflammation throughout the heel area.

This paper describes a simple, consistent method of using a unique glue-on shoe¹ that, when fitted appropriately, will be centered under the distal phalanx. This method of farriery is used to relieve sole pressure, enhance wall thickness with the use of adhesives, and provide support to the bulbs of the heels.

2. Determining the Cause of Palmar Hoof Pain
To successfully reduce palmar hoof pain, the causes must be determined and eliminated where possible. It must be noted that not all palmer heel pain will originate from collapsed heels; there are many other causes. However, the cause can usually be localized to the hoof capsule by the farrier by simply removing the shoe and applying a homemade frog pressure bandage (Fig. 3). This type of bandage will elevate the sole off the ground and remove any pressure to the quarters of the hoof capsule. The other benefit of removing the shoes is that a complete inspection of hoof wall integrity and the sole wall junction can only be achieved with the shoes off.

If soundness is achieved by pulling the shoe and applying frog pressure, it is quite probable the cause will be a damaged hoof capsule, sole pressure, and the overlying shoe. The heel nails may also be the problem, but a close inspection of the sole and the use of hoof testers can confirm or eliminate the nails as the problem. It has been observed by this author that many horses will become sound because of the shoes being taken off and pressure removed from the sole. This also allows a hoof capsule to settle to a more natural position and inflammation to subside. The lameness will often improve if a horse is left barefoot for a few days, and this will also answer many other lameness questions.

Thin walls in the heel area are a major reason why horses become foot sore. When the hoof wall is thin, a high percentage of the web of the shoe ends, causing pressure on the sole (Fig. 4). It should be considered ideal when a thick healthy hoof wall and healthy frog are the main components to absorb the concussion to the foot.

Open shoes with a rim pad or a wedge in the heel area are often used to improve the angle of foot sore
horses, but this generally amplifies the problem. This is because of elevating the frog even further off the ground, which causes more pressure to the heel area. Even an inappropriately applied bar shoe can amplify palmar hoof pain because of sole pressure if there is inadequate hoof wall to support the weight of the horse.

Short shoes will leave the bulbs unsupported and puts excessive pressure to the heel area. It is thought that this type of hoof will have a delayed breakover. Because of the pain in the palmar foot, many horses will have a very short, stilted stride and will stumble quite often because they are trying to land on their toes.

Horses with thin walls, collapsed heels, flares, and poor growth will benefit from the addition of structural adhesives. Some horses with this type of hoof capsule can only be improved minimally, but the reduction of palmar heel pain can be reduced greatly if not completely eliminated.

It is important to remember that all new hoof wall growth will follow the old growth; therefore, the challenge is to redirect the growth pattern. Flared walls are the simplest to redirect, and this can be easily accomplished with glue on shoes. This process generally takes a few months depending on the amount of hoof growth achieved per month. The elimination of flares will greatly increase the strength of a hoof capsule. Collapsed heels will generally never be corrected because it is difficult to redirect the horn tubules to a more vertical state, but support under the bulbs can be restored artificially. Sole pressure can be reduced greatly if not totally eliminated immediately through the use of specially designed glue-on shoes. These shoes are designed to keep any of the rigid structural adhesive away from the sole and restrict it to the hoof wall.

Glue-on shoes can also be used very effectively to reverse the long toe/low heel configuration. The landing pattern of the hoof striking the ground will also improve because of easier breakover due to shortening of the toe (Fig. 5).

3. Method of Application

The method of glue-on shoe application described in this paper will differ from previous types primarily because of the shoe itself. This glue-on shoe uses a polyurethane pad placed on the outer edge of the shoe and a softer pad in the heel area. This shoe is designed to remove all sole pressure by providing a channel so that a soft rubber shoe liner can be placed into the channel to prevent any hardened adhesive from coming into contact with the sole (Fig. 6). The shoe liner will also remain soft and retain its original placement throughout the shoeing cycle. The soft padded heels will allow the placement of the shoe directly under the bulbs to give support and eliminate the downward flexing of these structures. The adhesive used is a polymethylmethacrylate (PMMA) composite that bonds the shoe to the hoof.

Palpation of the bulbs is an excellent indicator as to when the glue-on shoe should be applied. Any tenderness will be an indication of inflammation and/or an underlying abscess. If all tenderness is gone from the bulbs but some lameness is still present, hoof testers should be used to determine...
whether this is caused by thin soles. Horses with thin soles can be shod because the main benefit of this type of glue-on shoe is the elimination of sole pressure. Total soundness in these cases can take several weeks depending on growth rate of the hoof, which will produce depth of sole.

To successfully eliminate palmar heel pain, a good trim will be necessary first and foremost. The farrier should have a vision of what the final goal should be, which should hopefully be a hoof that looks comfortable to the size and conformation of the animal standing over it. Some horses will need many trims to balance the hoof capsule; some will never become completely balanced. This author considers that a balanced hoof should meet these criteria. A hoof capsule should be observed standing on a flat surface. Both bulbs should be of equal length in height from the ground. The frog is a perfect guideline to fit the shoe because it will indicate where the center of the hoof capsule is located. The end result should be a symmetrical fitting shoe around the frog. Many times this can only be achieved by creating artificial hoof wall with adhesives. The coronet band should be uniform in length from a side-to-side comparison. The front of the hoof capsule should be very close to parallel with the alignment of the pastern. The shoe and adhesive should support the bulbs of the heels. If these goals are met, the horse will look and usually be comfortable. One should know the limitations of the hoof capsule before proceeding to trim the hoof because a hoof that is excessively trimmed can cause severe hoof lameness. Any open steel or aluminum shoe can be used in most cases.

In many cases the walls are decayed and will need excessive debriding; distinguishing healthy hoof wall from decayed hoof wall can be a challenge. The use of an antiseptic/astringent* applied to the decayed wall will help differentiate healthy wall from damaged wall. The blue dye contained in this preparation will penetrate the depth of the deepest fissures. When the dye can no longer penetrate the wall or lamellae, it is considered healthy. This product will also help dry excess moisture from the hoof wall, which helps in the adhesion process.

Choosing the right size shoe and a proper shoe fit will dictate the amount of success with the procedure. The shoe should extend back under the bulbs of the hoof. The shoe should be shaped to give a normal appearance to the heel of the hoof. The one major benefit of using glue-on shoes is that you are able to create a perfect hoof capsule. (Fig. 7). The toe is reduced or “backed up” from the dorsal hoof wall as much as possible to get your preferred angle. Wedge shoes can be used to elevate the heel to get a higher angle, but remember frog pressure will be lost in this trade-off. The deeper the surface the horse travels over, the more successfully wedges can be used. To insure frog pressure, a liquid urethane pour* can be applied to the sole of a hoof in conjunction with most horseshoes and can work very well. These urethane products are a common choice among farriers.

To prepare the hoof, the author uses a die grinder with a cross-cut burr. It will leave a very clean, dust-free wall that provides a surface that is excellent for adhesion of the composite and shoe. A clean cloth should be wrapped on the foot to keep the hoof clean and dry until the shoe is applied. To prepare the shoe for gluing, a wire wheel should be used to roughen up the polyurethane section of the shoe.

The rubber shoe liner should be applied next (Fig. 8). The liners are very tacky and will stick very well to the shoe. These liners also keep the shoe in place while the glue sets. The composite is available in either fast or slow cure, which allows more time to place and mold the glue. These packs of adhesive can be either warmed up or packed in ice depending on the outside temperature. The farrier uses the adhesive that allows enough time for proper positioning of the shoe and shaping of adhesive.

After mixing the glue, the pad is coated with the adhesive and placed on a sheet of plastic. The remainder of the glue should be placed by the heels of the shoe to be used to fill in the voids (Fig. 9). Remove the hoof wrap and place the shoe on the hoof. Position the shoe using the frog as your guide, making sure the shoe is set under the bulbs. Press the shoe down tight to the hoof and mold the glue to the hoof and shoe using the palm of your hand. Remove any excess glue that has squeezed under the liner onto the sole and bar area.

Check the hardness of the glue with your fingernail, and when hard, place the foot on the ground.
Remove excess glue with a rasp and expose the rubber pad. This will allow the pad to bulge freely to help absorb the concussion.

The bulbs of the heels are now supported and cushioned (Fig. 10). All sole pressure has been removed, and walls have been strengthened.

The horse should be re-shod as growth dictates; this can be observed when the bulbs appear to hang over the back of the shoe or when the shoe is excessively worn.

4. Results
This technique has been performed by the author on >100 different horses during a 6-mo period. The horses treated by the author were predominantly Thoroughbreds, but other breeds including Standardbreds, a few jumpers, and a couple of Quarter Horses were treated.

This approach has returned consistent results by reducing or completely eliminating palmar hoof pain. The horses treated in this manner became very sound and were able to return to successful competition with only minor bond failures being noted. A few cases did not benefit from this method; these cases had extremely thin soles and impatient trainers. They would be noted to be sound when walking or light jogging, but full gallops would result in soreness.

In most of the cases treated, the lameness was localized to the hoof capsule because of thin walls and shoe positioned on the sole. Almost every horse was short shod, with the heels of the shoes tucked in to prevent the horse from pulling them off. Addressing the above factors with the method described was pivotal to a successful outcome.

5. Discussion
If the approach chosen to relieve palmar heel pain is through the use of glue-on shoes, you will find there are many different types of glue-on procedures from which to choose. Many horses have improved greatly in soundness from the use of these different techniques, but in some cases, the horse has become lamer.

Failure to relieve palmar heel pain seems to be the result of three factors: (1.) relatively rigid acrylics in conjunction with metal or hard polyurethane shoes positioned on the sole of the hoof; (2.) the shoe is set short, leaving the bulb unsupported; and (3.) very thin soles, which need time for new growth.

The author’s goal is always 100% soundness in the hoof, so when soundness is just improved, it is considered a defeat. Experience has shown that the use of glue-on shoes without any sort of buffer be-
tween a collapsed heel and the shoe often results in very tender bulbs if not severe lameness.

These types of failures have led to many innovations over the years, including the need for a cushion or pad under a collapsed heel.

The advantage of the method described in this report is that the procedure has a strong bond with a minimal amount of adhesive; zero sole pressure; and total support of the heel area while being relatively simple and easy to learn. Unfortunately, the proven advantages to using this special glue-on shoe can be quickly negated because of a poor trim, poorly shaped shoes, and poor placement of the shoe on the foot. The challenge is always to isolate the problem, trim appropriately, and apply the product correctly to alleviate the cause.

Acknowledgment

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Footnotes

\(^a\)Yasha Comfort Heel Glue-on, Tenderhoof Solutions, Ridgetown, Ontario, Canada N0P 2C0.
\(^b\)MHC Adhesive, Tenderhoof Solutions, Ridgetown, Ontario, Canada N0P 2C0
\(^c\)Thrush Buster, Mustad, 9600 AN Drachten, The Netherlands.
\(^d\)Equi-Pac, Vettec Hoof Care Products, Oxnard, CA 93033.