Application of the Fetlock Support Shoe for Suspensory Desmopathy

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Suspensory ligament injuries are a significant cause of lameness in performance horses and race-horses. Although treatments to decrease inflammation and stimulate ligament healing are used to treat most injuries, stress on these structures is unchanged as the result of normal weight-bearing required during rest. Use of a fetlock support shoe can facilitate healing by preventing excess stress on the suspensory ligament. This technique is particularly helpful in supporting the rear fetlock during treatment of suspensory ligament desmopathy. Authors’ address: Marion duPont Scott Equine Medical Center, Virginia Tech, PO Box 1938, Leesburg, VA 20177; nawhite2@vt.edu. *Corresponding and presenting author. © 2013 AAEP.

1. Introduction

The fetlock support shoe or brace (also known as the “Roberts Shoe”) is depicted in books published in the early 1900s for treatment of tendon or suspensory rupture (Fig. 1).1,2 In more recent texts, the various modifications of the support shoe are described. Although there are numerous descriptions in textbooks, there are few reports in the literature describing success or failure with different types of injuries.3,4 A support shoe used for support of tendon lacerations was reported to be successful in restoring use in 60% of horses.5

Dorsal support of the fetlock can be provided by splints such as the Kimzey Splint6 or in a cast, however, these are normally used during the initial phase of support but do not allow the partial loading of the suspensory ligament needed for healing over the long term. Attempts to attach a splint on the dorsal aspect of the limb have been used by the authors, but these splints do not allow normal flexion of the fetlock, and tension applied by the bandage behind the metacarpus/metatarsus and fetlock can result in pressure sores (Fig. 2).

Treatment for proximal rear suspensory ligament desmopathy (injury at the origin) is reported to be less successful in horses with straight rear limbs and excessive dorsiflexion of the fetlock, causing constant stress on the suspensory ligament (Fig. 3).6

To facilitate healing in cases of suspensory desmopathy, a fetlock support shoe was used by the authors to limit fetlock dorsiflexion and relieve stress on the suspensory ligament(s) during healing.

2. Materials and Methods

Chronically lame horses with rear-limb suspensory ligament lesions at the origin or in the suspensory branches (diagnosed by ultrasonography) were treated with a fetlock support shoe. All the horses had rest and surgical or regenerative medical treatment of the hypoechoic lesions. Selected horses with excessive fetlock dorsiflexion associated with proximal suspensory desmopathy were fitted with a...
fetlock support horseshoe for 1 to 2 months during a recommended period of stall rest.

The fetlock support shoe, which requires experience and skill for proper construction, was designed as a bar shoe with toe clips, an extended heel (3–5 cm), and two hex nuts welded to the heel extension. Two support rods were designed and measured with a length to reach just past the level of the fetlock for each horse. The rods were welded together near the shoe and inserted into the hex nuts. A setscrew in the side of the hex nut was used to keep rods from moving. This allows the rods to be removed for management of the bandage, which is needed for padding (Fig. 4). A support wrap with several layers of sheet cotton was applied from the coronary band to the proximal metacarpus/metatarsus. An elastic adhesive bandage was wrapped from side to side around the support rods and positioned tightly to support the fetlock when the horse bears weight on the limb. An alternative is the use of rubber tubing around the supports to provide more flexibility during weight-bearing. The brace can be left open or covered with a light bandage placed to cover the support rods, which allow the fetlock to flex during walking without any pressure on the limb. Adequate padding on the limb is required to prevent pressure sores on the back of the fetlock.

3. Results

Seven horses with excessive rear fetlock dorsiflexion and chronic suspensory ligament desmopathy were treated with a fetlock support shoe and rest. Three of six horses with proximal suspensory ligament desmopathy were treated with desmoplasty/fas-

Fig. 1. Horseshoe with extended heels and a support brace (A) is designed to have a leather strap between the bars to support the fetlock as it descends in extension (B).1

Fig. 2. Dorsal splint (A) was successful in increasing the pastern angle during full weight-bearing but resulted in pressure sores on the back of the fetlock (B).
ciotomy, two with platelet rich plasma (PRP) injection, and one with desmoplasty/fasciotomy, PRP, and stem cells.\textsuperscript{7} One horse with chronic suspensory branch desmopathy had a fetlock support shoe applied and had no treatment other than rest (Fig. 3). All horses had absolute stall rest while wearing the support shoe. All seven horses had improved ultrasonographic evidence of healing and subjectively had improved conformation (less abnormal fetlock dorsiflexion) after wearing the shoe for approximately 8 weeks. All hypoechoic regions in the suspensory ligaments had increased echogenicity 2 months after the treatments and rest. The horse with chronic suspensory branch injury was scheduled to have PRP injection in the core lesions, but after 2 months of support, intralesional treatment was not required. In the six horses for which short-term follow-up was available, lameness was resolved in six horses at the time of the last recheck either by examination or communication with the owner. Long-term follow-up included resolution of the lameness in four horses: one horse used for very light riding, one for dressage, one sound in turn-out and about to be returned to work, and one retired (sound in turn-out). Three horses were lost to long-term follow-up.

4. Discussion
Recommended treatments for suspensory desmopathy include rest, support bandages, anti-inflammatory therapy, and a slow return to controlled exercise. Stem cells and PRP injection also anecdotally help to stimulate healing. Although resolution of lameness and return to exercise after lateral plantar neurectomy with fasciotomy or ultrasound-guided suspensory desmoplasty is approximately 70\% to 80\%, horses with “dropped fetlocks,” either at rest or at the walk, are unlikely to return to any type of exercise under saddle because of failure of healing or re-injury.\textsuperscript{6–8}

Horses with an abnormal rear-limb conformation (straight angle in the hock with excess dorsiflexion)

\begin{figure*}[h]
\centering
\includegraphics[width=\textwidth]{horse_with_shoe.png}
\caption{Horse with a bilateral rear proximal suspensory ligament desmopathy. The prognosis for resolution of the desmopathy in horses with straight leg conformation and excessive extension of the fetlock is poor.\textsuperscript{5}}
\end{figure*}

\begin{figure*}[h]
\centering
\includegraphics[width=\textwidth]{shoe_design.png}
\caption{Shoe is designed with hex nuts attached to the extended heel and locking screws inserted through the hex nuts to allow removal of the support rods for adjustment and bandaging (A). Elastic adhesive bandage is used to create a flexible sling to reduce fetlock extension (B).}
\end{figure*}
of the fetlock, as shown in Fig. 3) appear to place excess tension on the suspensory ligament, which increases the risk for injury or resistance to healing. The authors’ experience suggests that injury to the proximal suspensory ligament can lead to this altered rear-limb conformation, but it has not been determined if one problem precedes the other. In these cases, use of the fetlock support shoe has helped to resolve the desmopathy and subjectively improved rear-limb conformation in seven horses during the treatment period. Because all except one horse had multiple treatments, it is possible that the other treatments may have been successful without the fetlock support. However, the clinical response in these cases suggests that fetlock support is an aid in the successful treatment of rear-limb suspensory desmopathy associated with abnormal fetlock conformation. Critical assessment of this technique is needed to determine if it is successful in returning horses to their previous level of work.6,7

References and Footnotes

*Kimzey Leg Saver Splint, Kimzey Metal Products, 164 Kentucky Avenue, Woodland, CA 95695.
*bElastikon, Johnson and Johnson, One Johnson & Johnson Plaza, New Brunswick, NJ 08933.