How to Use a Fetlock Support Brace to Manage Lacerations of Equine Flexor Tendons

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Horses with flexor tendon lacerations can be treated with the application of a fetlock support brace. This results in decreased time of hospitalization and decreased cost, and it achieves success rates comparable with the more traditional treatments that involve tenorrhaphy and cast immobilization. Authors’ address: College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, Texas 77843; e-mail: cwhitfield@cvm.tamu.edu. © 2009 AAEP.

1. Introduction
Equine flexor tendon lacerations are a relatively common injury in the horse.1–5 The prognosis of flexor tendon lacerations in the horse varies from poor to good with reports of 45%,6 59%,3 and 78%1 of survival. Previously reported treatment options consist of a period of external coaptation (cast or splint bandage) with or without tenorrhaphy for an extended period of time, usually for a period of 60–90 days,5 followed by a gradual return to weight bearing.7 Casting or splinting a limb often requires general anesthesia both for the initial placement as well as periodic cast changes, and more expense is incurred when additional hospitalization and casting materials are necessary. In addition, lower limb casts are often plagued with complications that many owners are not familiar with or able to recognize, which results in extended periods of hospitalization. Application of the fetlock support brace can be performed shortly after presentation, and the horse may be discharged within a few days of application to continue convalescence at home. Therefore, similar results as with more traditional therapeutic protocols of treatment of flexor tendon lacerations are obtained without incurring the expense of hospitalization.

2. Material and Methods
Initial Evaluation and Treatment
Every horse with a tendon laceration should be assessed and treated on an individual basis based on owner concerns, exact nature of the laceration, and clinician preference. General principles include thorough debridement and cleaning of all wounds. If the wound is minor and the horse tractable, debridement and wound exploration can be performed under standing sedation. General anesthesia may be indicated in some horses based on the disposition of the animal, severity of the laceration, and level of contamination. It may also be necessary to allow for suture of the laceration or to perform tenorrhaphy in selected cases.

After initial wound care is completed, a modified Robert Jones bandage should be placed on the distal limb. A distal limb splint or Kimzey splint can be used to provide support during the time interval...
between initial evaluation and construction and application of the fetlock support brace by a farrier. In addition to the above therapy, other treatment may be indicated including systemic antimicrobials and/or regional limb perfusions and systemic anti-inflammatory drugs. When a farrier is available, the horse should be shod as described below.

Construction of the Fetlock Support Brace

The horse’s foot is trimmed, and a flat steel shoe with a 0.25-in extended heel is placed in a routine manner. This shoe is then modified by the addition of a length of 0.50-in hollow pipe welded across the heels so that the ends are flush with the outside of the shoe but left open. Next, a length (48–54 in) of 0.50-in steel rod is shaped to act as a brace extending over the palmar/plantar aspect of the limb to a point 5–10 cm distal to the carpus/tarsus. The length of rod is formed to a U shape with the arms being slightly wider than the patient’s leg and a gentle curve at the most proximal aspect. The proximal aspect of the brace is then heated and bent at 90° to act as the proximal support on the palmar/plantar aspect of the limb (Fig. 1). Approximately 12 in distally, the brace is bent to a 135° angle at the level of the fetlock joint (Fig. 2). One inch in from the distal ends of the brace is heated, and both arms are bent at 90°; this will be inserted into each end of the hollow pipe welded to the caudal aspect of the shoe. Two eyelets (1.0 × 0.5 in), one placed near the proximal aspect of the brace and one placed just proximal to the fetlock, are welded to the arms of the brace to accept two dorsally placed straps (Fig. 3). The straps are tightened against a 10-cm length of rubber inner tube (8 cm in diameter) that has been slipped over the palmar/plantar brace to provide support (Fig. 4). A moderately thick distal limb bandage is then applied with a dorsal splint (3-in Schedule 40 PVC pipe cut to a length of 6–8 in) before the brace is strapped into place to prevent dorsal metacarpal/tarsal pressure sores (Fig. 5).

After application of the support brace, the bandage can be changed as needed to provide access to the wound for ancillary therapy (regional limb perfusion, further debridement, delayed primary closure of the skin wound, management of excessive granulation tissue, etc.). The horse can be discharged to the care of its owner as soon as the practitioner feels comfortable with the wound and the owner’s ability to manage it at home. The bandage itself is relatively easy to change. It is a simple modified Robert Jones bandage, and the brace aspect of the shoe is easy to strap on and off as needed.

When the horse is discharged, the owner is instructed to have the brace reset every 6–8 wk based on the healing of the tendons and clinical appearance. In addition, the rubber inner tube can lose some elasticity, which necessitates its replacement along with the shoe reset.
3. Discussion and Results

Although there are numerous variations in management of equine flexor tendon lacerations, the basic goals of management remain similar and include a long period of coaptation to allow for blood vessel invasion and tendon fiber alignment followed by a gradual increase in range of motion and weight bearing.\(^5\) There are many methods for providing...

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Fig. 3. Steel eyelets are welded to the brace to secure the brace to the distal limb.

Fig. 4. The assembled fetlock support brace components when not attached to the patient. The distal aspect of the brace is to the right and the proximal aspect is to the left of the photograph.
this rigid external coaptation including cast, bandage cast, splint, trailer shoe and bandages, and support wrap alone.\textsuperscript{1,3,8} The ability of most owners to manage these cases at home is variable. The complications of some of these methods for the equine are not uncommon and can be fatal; this necessitates hospitalization until the management becomes easier, which can be after many weeks of treatment.\textsuperscript{1} The decision for tenorrhaphy remains somewhat controversial\textsuperscript{9} but certainly is not indicated or even possible in all cases depending on the chronicity and amount of soft tissue damage. Obviously, long periods of hospitalization and surgery are associated with significant cost for the owner.

The use of the fetlock support shoe for management of flexor tendon lacerations has several benefits over more traditional approaches. First, it can be applied shortly after injury, and the after care is simple, resulting in shorter periods of hospitalization. It allows for easy access to the wound. This makes appropriate wound care easier, which is needed in many of these cases. The support shoe seems to clinically withstand the loads placed on it, even in the face of severe lacerations involving both the superficial digital flexor tendon and deep digital flexor tendon as well as the suspensory ligament. The rigidity of the support shoe is likely not as stable as a more traditional distal limb cast; however, there are numerous studies advocating some degree of early motion at the healing site to reduce adhesion formation as well as strengthen the repair tissue.\textsuperscript{10,11} If the support brace is used on a forelimb, some modification may be necessary, because the hind foot will likely interfere with forelimb heel extension.

Complications that can occur include bandage sores, loss of elasticity of the rubber inner tube, and loss of the shoe to which the brace is attached. The bandage sores are typically mild and easily managed conservatively, and the rubber material and the shoe can be easily replaced if lost. Another potential complication is inadequate stability depending on the size of the animal and the degree of damage. This has not been observed clinically but could potentially occur in very large horses with significant loss of stability because of the degree of damage; in those cases, a thick, rigid cast may be a better option. This brace has been used clinically on a number of cases with success rates that are not significantly different than those reported in the literature. Additionally, significantly fewer days of hospitalization were needed compared with horses treated in a more traditional approach.

The average cost of a cast application in our hospital without general anesthesia is $250. The average cast will require replacement in 3–4 wk, and therefore, over a 90-day period, three casts will need to be applied. This results in a cost of $750, not including hospitalization or general anesthesia. Our farrier charges $450 for construction and appli-
cation of the initial brace and then $80 dollars for the reset in 6–8. Therefore, the total is $530 for 90 days.

4. Conclusion

Horses with flexor tendon lacerations can be treated with the application of a fetlock support brace. This results in decreased time of hospitalization and decreased cost, and it achieves success rates comparable with the more traditional treatments that involve tenorrhaphy and cast immobilization.

References