



VETERINARY REVIEW

Non-Refereed Articles and Papers

THE USE OF ELASTO-GEL™ ON EQUINE WOUNDS

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SUMMARY

Elasto-Gel™^a is a bandage dressing that has primarily been used in human medicine to aid in the healing process of large open wounds. It is considered an occlusive dressing which automatically places it in a category of non-acceptance in equine medicine. We, however, have used this dressing during the repair phase of equine wounds and found it to be helpful in achieving cosmetic results in wounds healing by second intention. The use of Elasto-Gel™ can minimize the need for debridement while maximizing the length between bandage changes which makes it a practical dressing for wound management in the field.

INTRODUCTION

Equine wounds are a common occurrence. Several types of wounds are either unable to be sutured or fail to heal by primary closure due to such factors as tension, infection, and re-injury. The management of wounds healing by second intention focuses on controlling infection and exuberant granulation tissue since both these items can greatly delay wound healing and epithelialization.

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Normal wound healing consists of four overlapping phases: inflammatory, debridement, repair, and maturation. The repair phase involves "epithelialization of the wound surface, migration of fibroblasts necessary for collagen formation, formation of granulation tissue and wound contraction."¹ This entire process relies on "the viability and physiological integrity of surrounding (i.e., peripheral to deep) tissue because this will be the source of inflammatory cells, capillary buds, fibroblasts and epithelium."² Whenever possible, wounds are bandaged to help maintain the viability of this tissue.

Currently the most common dressing recommended for granulating wounds is a non-adherent semioclusive dressing (i.e., Telfa^b) with an antibiotic ointment containing steroids (i.e., Panalog^c) plus debridement as needed to control exuberant granulation tissue. We would like to propose Elasto-Gel™ as a dressing that can be used as an alternative to the traditional management of equine wounds during the repair phase.

DISCUSSION

Elasto-Gel™ is a sterile wound dressing that consists primarily of water and glycerin crosslinked in a polymer matrix. Until now this hydrogel sheet has been primarily used in human medicine on severe burn wounds. It is both bacteriostatic and fungistatic. It is also very absorbent but does not dry out nor adhere to wound surfaces.

Other properties reported in human medicine include its ability to reduce edema in the wound, provide pain relief, reduce formation of exuberant granulation tissue, and minimize scarring.

We have had similar observations on equine wounds in that the gel pad seems to decrease the incidence of exuberant granulation tissue in equine wounds, which allows for uninterrupted wound contraction and epithelialization of the wound.

Interestingly, Elasto-Gel™ is classified as occlusive, yet it is oxygen and moisture permeable according to the manufacturer. This permeability may help explain why our findings are in sharp contrast to the popular acceptance that occlusive dressings increase the incidence of excess granulation tissue in equine wounds.

Elasto-Gel™ can be used on any wound that is healing by second intention and is capable of being bandaged. The gel pad can also be used to protect cast sores and sutured wounds by keeping exudate off the wound. Elasto-Gel™ can be applied directly to the wound or after application of ointments such as povidone-iodine, triple antibiotic, or Panalog.

The gel pad is best held in place with an adhesive wrap such as Elastikon.^d Additionally, a heavier support wrap, splint, or cast can be applied as needed for absorption, protection, or immobilization. The frequency of wrap changes depends on the amount of exudate, the need to evaluate progress (i.e., coverage of bone or closure of a draining tendon sheath), and the amount of activity by the horse. In the earlier stages of healing, daily bandage changes may be necessary but during the end stages of repair, changes every five days may be adequate.

^aElasto-Gel™, Southwest Technologies, Inc., Kansas City, Mo.

^bTelfa, Kendall Healthcare Products Co., Mansfield, Ma.

^cPanalog, Solvay Animal Health, Inc., Mendota Heights, Mn.

^dElastikon, Johnson & Johnson Medical Inc., Arlington, Tx.

We've used this gel pad successfully on a variety of wounds including lacerations of the heel bulbs, metacarpal and metatarsal regions, tarsi, lateral thorax, pasterns, and carpi. In all cases, the main goal was to minimize the amount of scarring of open wounds in a manner that did not require hospitalization and was conducive to owner compliance. Some of the wounds have involved exposure of bone, penetration of synovial structures or severe infection with aggressive microorganisms. The use of systemic antibiotics and other medical/surgical procedures were performed on these cases when appropriate or allowed by the owners.

One major advantage we've observed with this dressing is its extensive absorptive property which helps keep exudate off the wound, yet the dressing does not dry out and subse-

quently adhere to the wound. This allows for less frequent bandage changes, which can lead to better owner compliance for wound care.

Another benefit we've observed while using this dressing is a decreased need to trim exuberant granulation tissue. In most cases we have only had to debride tissue in the first week when the wound was still contaminated. This can reduce the need for sedating the horse and the associated costs to the owner. We usually have used povidone-iodine ointment in the first week if the wound was deep or highly contaminated; followed by no ointment while the granulation bed was quite exudative; and finished with triple antibiotic ointment after the wound was less exudative but still forming epithelium.

We continued to bandage the

wounds until epithelialization was complete, arrested, or until the owners decided to discontinue the bandaging. The minimum time to healing was two weeks, the maximum time to healing was six months.

The only disadvantages we've noticed with Elasto-Gel™ are the initial increased cost and heavier weight when compared to a Telfa. The product does cost more initially but may end up being more economical by decreasing the amount of bandaging and debridement needed over the course of healing. The weight of the gel pad is approximately 0.15 kg for a 6"x8" sheet. This, in combination with its slippery gelatin-like consistency, makes it more likely to slip than thinner dressings. This problem can usually be remedied by using an elastic adhesive to hold it in place.

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¹Jain MK, Berg RA. "Material Properties of Hard Tissue Substitutes", Man, In Prep.

²Stotts N, Tevis D. "Co-factors in Impaired Wound Healing", Ostomy/Wound Management, 42:48,1996.

³Silver FH. "Biological Materials, Structure, Properties and Modeling of Soft Tissues", NYU Press, 1987.

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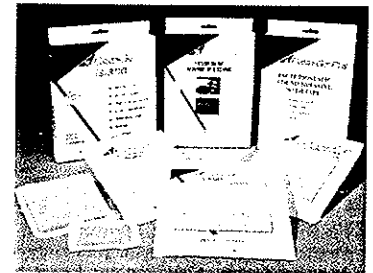


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- Inflammatory airway disease. Bonnie Rush
- Strangles - diagnosis and treatment of sequelae. Richard Newton
- Fell pony syndrome. Derek Knottenbelt
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- Management of ocular and periocular tumors. Derek Knottenbelt
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Equine Behavior and Behavioral Problems

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- Natural behavior. Deborah Goodwin
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Session 2: Learned behavior - Chairman: Ian Robinson

- The development of behavioral problems in the horse. Daniel Mills
- Stereotypic weaving - the effect of stable layout. Jonathan Cooper
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Session 3: Managing inappropriate behavior - Chairman: Daniel Mills

- How to solve behavioral problems with training techniques. Natalie Waran
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Session 4: Mare and foal bonding - Chairman: Daniel Mills

- The battered foal - Mare rejection of the foal. Katherine Houpt
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Comparatively reduced soft tissue density of SDF and DDF in groups 1 and 2 demonstrated reduced thickening. However, moderate thickening present in glycerine preserved grafted tendon could be due to the persisting fibroblastic activity to replace the grafted tissue.⁸ The increased soft tissue density in control animals indicates the filling of the tenectomy gap by the fibrotic tissue.

Similar findings were also reported in desmitis of fetlock annular ligaments in horses.² The presence of clear demarcation between grafted SDF and traumatized DDF tendons and surrounding structures at three to four months demonstrated the absence of peritendinous adhesions in the deep frozen and plasma stored tendon grafted animals. The presence of soft tissue swelling in the grafted and surrounding region of SDF in glycerine preserved grafted animals and at the tendon stumps along with tenectomy gap in control animals may be due to the fibrotic healing. Angiography did not show any significant change after grafting in the present study. Few new vessels could be seen in the vicinity due to excessive fibrous tissue formation in the gap and in the surrounding area of the control animal. Intratendinous vessels in cadaver buffalo calves were demonstrated by angiography.⁵

To conclude, air-tendograms provided valuable information for evaluating tendon continuity, thickness, healing and peritendinous adhesion following homologous tendon grafting in the equine. Tendon thickening and peritendinous adhesions were minimal in plasma stored and deep frozen tendon grafts as compared to glycerine saline stored grafts.

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CONCLUSION

Elasto-Gel™ on equine wounds healing by second intention can lead to a suitable cosmetic result with minimal effort. The ability of the dressing to draw discharge from the wound, yet not dry the wound out, allows for less frequent bandage changes which can lead to an increase in client compliance. The need for less frequent bandage changes and debridement are beneficial especially if the horse is difficult to handle and/or if cost concerns limit the amount of veterinary supervision during the course of wound healing.

When the costs of sedation and surgical debridement are lowered, along with the frequency of bandage changes, more clients seem to be willing to continue with the desired wound therapy instead of letting the wound "air out" and form a large scar. The results of

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continued bandaging with Elasto-Gel™ can result in minimal scarring, thus offering a practical alternative to wound management.

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