Proceedings of the 56th Annual Convention of the American Association of Equine Practitioners - AAEP -

December 4-8, 2010
Baltimore, Maryland, USA

Next Meeting:

Nov. 18-22, 2011 - San Antonio, Texas, USA

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Evaluation of a Novel Hyaluronic Acid–Based Biomaterial to Enhance Wound Healing in the Equine Distal Limb

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Hyaluronan-based films may improve the quality of healing in distal limb wounds in horses. Authors’ addresses: Comparative Musculoskeletal Research Laboratory, Departments of Large Animal Clinical Sciences (Dahlgren, Milton, Boswell, Jones, Crisman) and Biological Sciences and Pathobiology (Werre), Virginia-Maryland Regional College of Veterinary Medicine, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061-0442; e-mail: lad11@vt.edu. © 2010 AAEP.

1. Introduction
Traumatic lower limb wounds are common in horses. Hyaluronan is ubiquitous in extracellular matrix, has antifibrotic properties, and may stimulate fibroblast proliferation while decreasing scar production. Hyaluronan-based biomaterials (CMHA) may provide structural support for proliferation and differentiation of mesenchymal stem cells in wound repair. The purpose of this study was to investigate the ability of CMHA to promote healing in an equine distal limb wound model. We hypothesized that CMHA would accelerate healing and decrease scar formation.

2. Materials and Methods
Full-thickness skin wounds created on both metacarpi/metatarsi (MC/MT) of eight horses were treated with one of four treatments: no CMHA (control), single application of CMHA gel, multiple applications of CMHA gel, and multiple applications of CMHA film. Wounds were assessed for quality of repair tissue and photographed for image analysis at bandage changes every 4 days for 7 wk. Exuberant granulation tissue was excised as needed. Wound size and epithelialization were analyzed by analysis of covariance, with significance set at p < 0.05.

3. Results
All wounds required trimming. There was a significant day by treatment interaction; however, there were no significant differences among treatment groups overall (p = 0.09). The wounds treated with CMHA films healed faster and with higher-quality, less fragile epithelium compared with other treatment groups.

4. Discussion
Day by treatment interaction suggests different treatments had differing effects on wounds over
time. The quantitative and qualitative differences between film-treated and other wounds suggest decreased inflammation and/or decreased scar tissue formation.