Track: Case Series/Study

A Novel Bioabsorbable Borate-based Glass Fiber Matrix Supports Wound Healing

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There is an increasing demand for biomaterials that have the ability to support wound healing. Ideally, bioactive materials should be non-toxic and biocompatible, having the same mechanical properties and porosity of the tissue to be replaced while supporting biological activities such as cellular adhesion, proliferation, differentiation, and angiogenesis.[1] Borate bioactive glass (BBG) is one such material gaining favor in the wound care space. Research has shown that BBGs have demonstrated the ability to assist in cellular chemotaxis, proliferation and differentiation in vivo.[2]

The author details 3 patient case reports in which a BBG wound matrix was used to treat chronic hard-to-heal wounds of varying etiology. In all cases wounds were treated with standard of care which included cleansing wounds with normal sterile saline, debridement to appropriate level to remove devitalized tissues, application of the BBG wound matrix, and application of a secondary dressing to ensure a moist healing environment. Patients were monitored weekly. Wound assessments including wound measurements were obtained. NSS irrigation was used to flush away any loose product still present in the wound base. Reapplication of the BBG matrix was performed weekly until evidence of wound closure was noted.

The BBG wound matrix demonstrated distinctive properties that supported repair and regeneration of soft tissue defects. When implanted, the BBG matrix formed a direct bond to wound tissues. The specific architecture of the BBG scaffold contributes to the material degradation rate while the pore structure provides the support cellular ingrowth and new tissue formation. The BBG matrix proved to an effective treatment in this case series of hard-to-heal chronic wounds.

Trademarked Items *(if applicable)*:

References *(if applicable):*

1. Rahaman MN, Day DE, Bal BS, Fu Q, Jung SB, Bonewald LF, Tomsia AP. Bioactive glass in tissue engineering. Acta Biomater. 2011 Jun;7(6):2355-73.

2. Nathan J. Thyparambil, Lisa C. Gutgesell, Bradley A. Bromet, Lauren E. Flowers, Samantha Greaney, Delbert E. Day, Julie A. Semon, Bioactive borate glass triggers phenotypic changes in adipose stem cells, Journal of Materials Science: Materials in Medicine, 1007/s10856-020-06366-w, **31**, 4, (2020).