Historical Evaluation of Implanted FBC Matrix

Two weeks after initial application, two punch biopsies were taken: 1) in a region where the FBC matrix had been placed into the wound and appeared incorporated and re-epithelialized; and 2) at a similar site except that re-epithelialization over the implanted FBC matrix was absent.

Biopsies were formalin fixed and paraffin embedded. Slides were stained with hematoxylin and eosin (H&E) for bright-field analysis or probed for immunohistochemistry using an antibody specific to fetal bovine collagen coupled with a fluorescent labeled secondary antibody. These slides were also stained with a DAPI fluorescent dye to identify cellular nuclei.

Biopsy 1: FBC Matrix Application and No Epithelialization

Biopsy 2: FBC Matrix Application and Re-epithelialization

Conclusions

This case study demonstrates through clinical observation and histological analysis the ability of PriMatrix, an extracellular fetal bovine collagen scaffold, to incorporate into a full thickness wound and generate a histologic dermal tissue that supports re-epithelialization. In this particular case, split thickness skin grafting was ultimately avoided as growing islands of epithelium developed on the FBC dermal matrix within 10 days of implantation. These epithelialized regions grew in size and eventually merged to definitively close the wound.

The histological evidence documented that the implantation of a FBC matrix in a full-thickness wound has the capacity to generate histologic dermis and skin where the acellular dermis is repopulated in situ with patient derived fibroblasts, epithelial skin cells, and vasculature. This case suggests that skin grafting can be avoided in certain wounds traditionally classified as full-thickness by managing them with FBC dermal matrix implants to promote dermal development and local re-epithelialization healing processes. Better definition of the wound characteristics amenable to this management approach as well as long-term cosmetic and functional outcomes as compared to conventional management are still to be determined.