Novel porcine collagen matrix used to stimulate wound closure in arrested wounds

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Background

Wounds, no matter the original etiology, can arrest in the cellular phase of closure and become entangled in a vicious cycle of chronicity. A novel collagen matrix capable of impairing MMP activity, optimizing wound bed moisture and has antimicrobial properties can re-establish the healing cascade in senescent wounds.

Methodology

Chronic wounds of varying etiologies not responding to conventional wound care based on principles of wound bed preparation were identified in an outpatient wound care clinic. A novel collagen matrix dressing with silver* was applied to those wounds that were clinically not thought to be infected. Dressings were changed every 3-7 days.

Results

No signs or symptoms of infection were detected during therapy, even in dressings changed every 5-7 days. The novel collagen matrix facilitated growth of granulation tissue and epithelialization, even in these recalcitrant wounds.

Conclusion

This novel protein matrix is a blend of triple helix and denatured porcine collagen mixed with carboxymethylcellulose, sodium alginate, Ethylene diamine tetracetic acid (EDTA), and silver. Besides collagen acting as a sacrificial substrate to divert activity of MMPs, fibronectin more readily binds and is activated by degraded collagen rather than native collagen. Once activated, fibronectin facilitates the recruitment, migration, and activation of key cells necessary to initiate and maintain the healing cascade. Due to additional components of the dressing, MMP activity is further suppressed, wound bed moisture optimized, and microbial growth limited. These effects appear to allow even arrested wounds to reinitiate the healing cascade.

Case Histories

Case #1: 60-year-old female with history of diabetes, peripheral neuropathy, hypertension, and degenerative joint disease NIS treated January 2007 for subcutaneous abscesses involving RLE with intravenous (IV) antibiotics, multiple surgical debridement, and delayed primary closure. She was subsequently referred to hyperbaric center and was treated for compromised flap with hyperbaric oxygen therapy but ultimately required repeat surgical debridement on 4-19-07 and NPWT was instituted the following day. NPWT was discontinued on 6-15-07. Although wound was filled with granulation tissue, the tissue was pale and bland. A novel porcine collagen matrix with silver* was used in conjunction with layered compression wrap and changed every 5 days. Granulation tissue improved in quality becoming brighter red and new epithelium began growing at margins. Wound was noted to be closed on 8-13-07.

Case #2: 72-year-old female with history of diabetes, hypertension, peripheral artery disease, peripheral neuropathy, coronary artery disease, congestive heart failure, and anemia with ulcer on plantar aspect of right 3rd toe that began in January 2007. Wound became infected and the distal toe was amputated in March 2007. The remaining toe was subsequently amputated on 4-20-07. At that time patient was referred to wound center and in addition to intravenous (IV) antibiotics was treated with adjunctive hyperbaric oxygen therapy, angioplasty, and NPWT. Patient’s course was complicated by worsening anemia and decompensation of congestive heart failure requiring mechanical ventilation. Wound failed to respond to NPWT and was withheld. A novel porcine collagen matrix was used in conjunction with becaplermin gel beginning 6-12-07. Within 4 weeks of initiation therapy, previously exposed tendon was granulated, wound was contracting, and new epithelial growth was noted at margins. Wound was closed by 8-2-07.

Case #3: 58-year-old female with history of spina bifida, ulcerative colitis, Sjogren’s syndrome, and hepatitis C with wound on lateral malleolus precipitated by minor trauma. Patient was referred to wound care center after 4 weeks of no response to conventional wound care. Novel porcine collagen matrix with silver* was first placed on wound bed 7-19-07 after one week of enzymatic debridement using collagenase. The collagen matrix was covered with adhesive foam dressing and was changed every 7 days. On 8-4-07, the wound was nearly closed.


BIOSTEP™ Ag Collagen Matrix Dressing with Silver – Smith & Nephew Wound Management Inc., Largo, FL.