OPTIMIZING THE WOUND BED FOR APPLICATION OF A SKIN GRAFT WITH A NOVEL ADAPTIVE SELF-ASSEMBLING PEPTIDE BARRIER SCAFFOLD AND A PEPTIDE TECHNOLOGY

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Introduction

Patients with open wounds often require a skin graft for closure. These patients are sometimes not candidates for immediate skin grafting. The wound bed requires optimization prior to reconstruction, and premature skin grafting can lead to graft rejection or undesired cosmesis.

We present two cases of patients whose graft beds were optimized for subsequent skin grafting with a novel and innovative adaptive self-assembling peptide barrier scaffold (aSABS)* technology. In patient 1, aSABS was used to cover exposed bone and tendon prior to grafting. In patient 2, aSABS was used to generate a healthy granular wound bed to reduce the contour irregularity in a facial full thickness graft.

Purpose

To demonstrate the efficacy of aSABS in optimizing the wound bed prior to skin graft. This is a retrospective study of 2 patients who received aSABS prior to receiving skin graft.

Discussion

aSABS mechanism of action derives from the physiochemical properties of its synthetic peptide. Upon exposure to ions in wounds, peptide units self-assemble into higher ordered nanofibrils and nanofibers before culminating in an entangled network. An extracellular matrix-like structure that contours to the macro and micro architecture of the wound milieu is formed. The network resembles that of collagen and provides a scaffold, enabling cell migration and proliferation as well as repair of damaged tissue.

Case Report 1

Patient 1 had a history of a motorcycle accident resulting in a tibia/fibula fracture. The patient underwent a dorsal foot rotation flap to cover the exposed bone and tendon with a skin grafting of the donor site. Subsequently, the distal flap failed, and the bone and tendon were re-exposed. The open wound was treated with 1 application of aSABS and within 14 days, granulation tissues covered the bone and tendon. The patient was able receive a morselized full thickness skin graft.

Figure 1: Non-healing wound

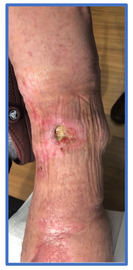


Figure 2: Wound after flap loss

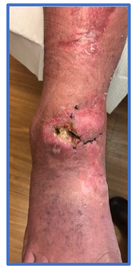


Figure 3: Post aSABS application

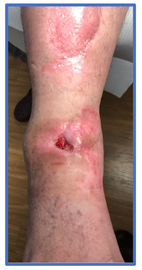
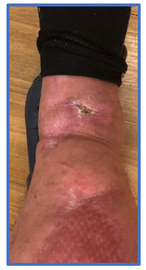


Figure 4: After skin grafting



Case Report 2

Patient 2 underwent Mohs resection of a left cheek basal cell cancer. Because application of a skin graft immediately following a resection can result in a permanent contour defect, the decision was made to optimize the wound bed and delay graft application. To reduce a contour defect of the full thickness graft, the defect was first treated with aSABS to create a neodermal element and improve graft contour. Seven days following the placement of the aSABS, the area was grafted with a full thickness graft. At four months, the graft follow-up showed good contour and complete healing

Conclusion

Both patients were followed for 3 months with continued closure of the wounds. These case reports demonstrate good results with the use of the aSABS in conjunction with skin grafting in two different scenarios of wound bed preparation ahead of a graft. Additional larger or prospective studies may be helpful to further evaluate this technology in these applications.

References

1. Wolcott R, Kamath K, Healing of a chronic refractory burn wound with a novel self-assembling peptide-based advanced wound dressing, Poster # CS-026, Symposium Advanced Wound Care (SAWC) Fall 2020 Virtual Conference, November 2020.
2. Kapp D, Pfendler L, D'Oro L, Wolcott R. Early clinical performance of an adaptive self-assembling barrier scaffold in nonhealing chronic wounds: a review of six cases. Wounds. 2022 Jan;33(1):20-30. doi: 10.25270/wounds/2022.2030. PMID: 35108216.

*AC5® Advanced Wound System, Arch Therapeutics, Inc., Framingham, MA