The Healing Power of Nature

Upper and lower extremity limb salvage with the use of the reconstructive elevator

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INTRODUCTION

The reconstructive ladder has been modified with the use of skin substitutes to an "elevator" to minimize morbidity of donor site grafts and free flaps, decrease recovery time, minimize hospital stays and improve function. Distal third lower extremity wounds and complex dorsal foot wounds are generally treated with free flaps and skin grafts. However, both has the morbidity of creating a donor site. Upper extremity hand wounds complicated with deep infections generally require local tissue rearrangement with local or regional perforated flaps and/or skin grafts. Implementing standard wound care principles – eradicating infection, optimizing blood supply, covering exposed deep structures or instrumentation, offloading, controlling exudate and optimizing range of motion, wound healing and return of function can be achieved in a timely fashion. Skin substitutes have given wound care specialists another tool in their armamentarium to stabilize an open wound and utilize the reconstructive elevator to achieve wound healing. Negative pressure wound therapy (NPWT) is another advancement that has proven to accelerate wound healing.

METHODS

A sixty-four-year immunocompromised male presented 5 days after sustained a "bite" to the dorsal hand. The patient was admitted for IV antibiotics, diagnostic imaging, wound cultures and pain management. Upon inspection, extensor tendons were exposed, no bony changes were identified on imaging, and he was neurovascular intact. The patient underwent several debridements, application of a skin substitute with NPWT and application of split thickness skin graft (STSG).

An eighty-three-year-old female sustained an acquired distal third and dorsal left lower extremity wound status post open reduction internal fixation (ORIF) after sustaining a fall 3 months prior. The patient received several debridements, application of two skin substitutes with NPWT.

*Kerecis™, Kerecis, Isafjordur, Iceland

CASE 1: 64-YEAR-OLD MALE TRAUMATIC WOUND

Patient History: 64-year-old immunocompromised male presented 5 days after sustaining a bite wound to the dorsal of left thumb.

Wound History: Patient was admitted for IV antibiotics, diagnostic imaging, debridement, nutritional supplements, wound cultures, and pain management. No bony changes were identified on imaging.

Kerecis Applications: Single application of intact fish skin graft (FSG)

Patient Outcomes: After a single application of FSG and split thickness skin graft (STSG), the wound fully healed at week 12 with excellent range of motion with no limitations.

Initial presentation prior to single application of fish skin graft

Week 1 Post op

Week 2 Post op

Week 3 Post op

Week 4 Post op

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CASE 2: 83-YEAR-OLD FEMALE LOWER EXTREMITY WOUND

Patient History: 83-year-old female presented 3 months post injury with an acquired distal third and dorsal left lower extremity wound status post open reduction internal fixation (ORIF) after sustaining a fall. Pt. sustained a pressure injury from her controlled ankle motion (CAM) boot.

Wound History: Patient underwent several debridements with FSG application and NPWT

Kerecis Applications: Two applications of intact fish skin graft (FSG)

Patient Outcomes: After two applications of FSG, the wound fully healed at week 15. Pt. had complete healing with coverage of her tendons and was pain free. Pt. continued with rehab with physical therapy and occupational therapy.

Initial presentation prior to initial application of fish skin graft

Month 4 Post op following two application of fish skin graft

RESULTS

Both patients completely healed with restoration of range of motion. Both patients received post operative physical therapy. Neither patient had a complication, nor an extended hospital stay. Both patients healed within 12 weeks of presentation.

DISCUSSION

Skin substitutes, specifically fish skin graft, Kerecis is a xenograft with similar biologic properties to allografts. Evidence shows that is the ability to revascularize over tendons and works synergistically with adjuvants therapies such as negative pressure wound therapy and split thickness skin grafts. These two cases demonstrates successful implementation of the reconstructive elevator. Lower limb salvage was achieved in an octogenarian that wound have otherwise needed free tissue transfer or an amputation. In the immunocompromised patient, the fish skin graft demonstrates the same efficacy and augmented neovascularization the skin thick skin graft without contracture and return of full range of motion. There is evidence to demonstrate that utilization of the fish skin graft minimizes hospitalization, reduces donor site morbidity, decreases the economic burden of acquired wound healing and can be used in conjunction with other advance wound modalities on the reconstructive elevator.

References

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