The Healing Power of Nature

Management of an Intractable Ulceration of the Achilles Tendon with Fish Skin Grafting*: A Case Report

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Roland A. Tolliver, DPM, FAPWCA, FACFAS, Fellow, APWCA
Center for Wound Healing at FHN, Freeport, IL

INTRODUCTION

Intact and fragmented fish skin grafts are being used to treat a variety of wounds to the lower extremity. Fish skin grafts are compatible with human tissue due to the structure, which closely resembles human skin. The grafts have no known risk of viral disease transmission. The grafts support cell and vascular ingrowth and undergo a minimal processing maintaining the and ease of use for applications provide a viable option for the multiple wounds encountered at the wound center, hospital and office settings. The benefit for the patient when using a compatible xenograft is that this reduces the need for an autograft and the resultant additional wound.
A novel skin substitute, fish skin, has emerged and has effectively healed acute wounds faster with improved functional outcomes (Baldursson et al., 2015 & Wallner et al., 2022) .
The primary purpose of this case series was to investigate fish skin graft (FSG) for the treatment of a hard-to-heal ulceration of the Achilles tendon.

METHODS

JB is a 73-year-old male with a history of arterial disease with ischemia to the left lower extremity which improved with angioplasty. He subsequently developed a pressure ulcer to the posterior aspect of the left leg from an AFO to support a chronic ankle varus deformity. The ulcer developed into cellulitis to the affected leg, and granuloma formation to the wound with exposed Achilles tendon. He had received treatment at another Wound Center with debridement, basic wound care and bioengineered skin grafting.

He was subsequently seen at the local hospital for a consultation. The patient received VeraFlow treatments to the ulcer upon initial care plan. A mixture of 80mg of Gentamicin/100ml of Normal Saline was infused, which reduced the bioburden to the infected ulcer site. The patient underwent surgical debridement with VersaJet on October 24, 2023, with removal of the hyper-granulation tissue over the ulcer. Fragmented fish skin graft was applied to the ulcer site and secured with a compression dressing. The patient related a significant reduction in the pain level after surgery. The dressings were changed two days later where there was a noted decrease in the erythema to the lower leg with early incorporation of the fragmented fish skin graft.

The patient was returned to the operating room three days later. The wound bed was clear of the hyper-granulation tissue with the wound bed measuring 8.5cm x 5cm x 0.2cm with decreased exposure of the Achilles tendon. The wound bed was prepped in the OR and was covered with intact fish skin graft. The graft was secured and covered with a Wound Vac. There were additional improvement noted with increased epithelial and new granulation tissue present upon discharge from the hospital.

RESULTS

The patient received additional care at the Center for Wound Healing at FHN. Standard of care was provided with wound compression dressings and intermittent application of biologic wound covers. No additional grafts were required due to the continued improvement. The patient now has basic wound dressings applied to protect the affected site with no exposure of the Achilles tendon and a marked reduction in pain. No additional signs of infection are present. The patient had returned to most of his daily living activities prior to suffering a myocardial infarction. He has been lost to follow up due to relocation for cardiac rehabilitation.

CONCLUSIONS

Lower extremity ulcers with exposure of the Achilles tendon are typically difficult to heal. Skin flaps, allografts, and muscle transfers have been utilized to aid in closure of the ulcers. Fish skin grafts are proving to be a viable alternative to aid in providing a healing a less than optimal healing environment including an exposed Achilles tendon.

CASE: 73-YEAR-OLD MALE PRESSURE ULCERATION

Patient History: 73-year-old male with pmh arterial disease with ischemia to the left lower extremity

Wound History: Patient developed .a pressure ulceration to the posterior aspect of the left leg from an AFO to support a chronic ankle varus deformity. The ulceration developed into cellulitis with exposed Achilles tendon. Pt had received previous treatment at a different wound care center with debridement, basic wound care and bioengineered skin grafting.

Fish Skin Graft Applications: Two applications of fragmented fish skin graft intact fish skin graft in the OR setting

Patient Outcomes: Good healing progression seen two days after initial application of FSG with a notes decrease in the erythema to the lower leg and early incorporation of the FSG.1 week following second application of FSG, the wound bed was clear of hyper-granulation tissue.




Initial presentation with exposed Achilles tendon


Debridement to remove hypergranulation tissue


Fragmented fish skin graft is applied to the wound


Fragmented fish skin graft mixed with patient's blood prior to application


Follow up – early incorporation of fragmented fish skin graft


Follow up –increased granulation tissue and wound size has decreased


Follow up



Patient lost to follow up and had a heart attack


Good healing progression

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