

The Healing
Power of
Nature

Intact Fish Skin Graft for the Treatment
of Bilateral Burns in an Aging Patient

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Institution, organization, establishment, foundation

INTRODUCTION

Aging is a risk factor for burn injury due to cognitive and sensory impairment, attenuated mobility, slow reaction times, and medications associated with morbidity¹. Evidence suggests that patients ≥ 60 years of age represent 14% of burn center admissions¹. Arguably, morphological age-related changes, including impaired immunological response, augment morbidity and mortality in the aging burn victim, with evidence suggesting that older burn victims have a two times higher mortality rate compared to their younger counterparts². As such, treatment options that can mitigate age-related complications and augment healing may reduce morbidity and mortality. Acellular fish skin graft has been shown to expedite healing in chronic and acute wounds^{3,4}. This investigation aimed to examine acellular fish skin graft in an elderly patient who suffered bilateral full-thickness thermal burns.

METHODS

An 82-year-old female was admitted with bilateral full-thickness thermal burns on her buttocks associated with cellulitis. The patient fell on her hot asphalt driveway and was unable to regain ambulation for more than thirty minutes. The patient initially refused treatment and ultimately presented to her primary care doctor with unresolved draining wounds. Past medical history was significant for obesity, hypertension, hyperlipidemia, atrial fibrillation, and aortic stenosis. The initial wound presentation consisted of 20 by 12 cm on the left and 14 by 12 cm on the right buttocks post debridement. Operative cultures were analyzed by Infectious Disease, which revealed positive cultures for Escherichia coli, Morganella morganii, Staphylococcus lugdunensis, and Streptococcus viridans. The patient treatment plan consisted of culture specific IV antibiotics, fish skin graft, and negative pressure therapy.

CASE: : 82-YEAR-OLD FEMALE BILATERAL FULL-THICKNESS THERMAL BURNS

Patient History: PMH was significant for obesity, hypertension, hyperlipidemia, atrial fibrillation, and aortic stenosis

Wound History: Patient fell on hot asphalt driveway and was unable to regain ambulation for more than thirty minutes

Intact Fish Skin Graft Applications: One application of fish skin graft

Patient Outcomes: Patient went on to heal in two months with only one application of fish skin graft and tar-geted IV antibiotics



INITIAL PRESENTATION:



LEFT POST-DEBRIDEMENT:
20x12cm Right post-debridement: 14x12cm



APPLICATION OF INTACT FISH SKIN GRAFT



FOLLOW UP



INTRODUCTION

The patient refused staged tissue reconstruction, and advanced therapy was discontinued, with primary wound care performed in a skilled nursing facility. The patient went on to heal in two months with only one application of fish skin graft and targeted IV antibiotics.

CONCLUSIONS

Aging represents a population at risk of morbidity and mortality associated with burn injury, and prognostic measures and advanced treatments need to be understood¹. In our experience, fish skin graft and target IV antibiotics attenuated morbidity. Inferences to the clinical efficacy in our case are made from current data that suggests that the microstructure of fish skin grafts mimics that of the human dermis, allowing for coordinated and rapid cellular integration downstream⁵. Further, polyunsaturated fatty acids and their downstream metabolites have been shown to have immunomodulatory effects, transform the structural dynamics of skin, and defend against microbial pathogens⁶. Lastly, Smolle et al. (2023) report a favorable outcome using fish skin graft and targeted IV antibiotics in a burn patient with known gram-negative bacteria⁷. The limitation is explicit, and more extensive prospective studies should determine the clinical efficacy of treating burns in aging.

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