# The Healina Mature

# The use of fragmented intact fish skin graft in lower leg surgical wounds for definitive lesion closure



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#### INTRODUCTION

Lower leg surgical wounds post excisional removal of cancer lesions are challenging to heal many patients due to proximity and underlying medical conditions such as diabetes mellitus and peripheral vascular disease. Patients may require long term wound management or hyperbaric oxygen therapy to achieve favorable outcomes. A hallmark of fragmented intact fish skin grafts (FSG) is their ability to fill up irregular tissue defects after surgical procedures or trauma. Without the risk of viral disease transfer from fish to human, the FSG is gently processed maintaining the natural three-dimensional structure as well as the chemical complexity that are homologous to human skin. FSG can effectively be used to heal lower extremity wounds post-surgical excision.

#### METHODS

In this clinical case study, three patients presented with one or more underlying medical conditions that included poorly controlled diabetes mellitus, venous stasis, arterial and venous insufficiency, and hypertension. All patients had surgical management of skin cancer to the lower extremity requiring closure. The treatment option chosen was skin substitute grafting using FSG. The FSG was prepared based on the manufacturer's instructions. Simple secondary dressings were used to secure the graft with negative pressure wound vac when appropriate.

### CASE # 1: MOHS SURGICAL WOUND POST FAILED GRAFT EXCISION IN A DIABETIC

Patient History: 74 year old female with edema and venous stasis disease

Wound History: Failed full-thickness skin graft 2 weeks s/p Mohs surgical excision of squamous cell carcinoma (SCC) resulting in wound measuring 5.9 x 3.9 cm to the level of the subcutis

Kerecis Applications: 5 Applications of fragmented fish skin graft (FSG) and negative pressure therapy

Patient Outcomes: Complete wound healing with no complications in area of poor circulation resulting in a 3.5 x 1.8 cm flat scar



squamous cell carcinoma (SCC)



5. 9 x 3.9 cm wound to the subcutis Failed skin graft with surrounding repaired with a full thickness skin inflammation 2 weeks post-op in graft s/p Mohs surgical excision of a setting of poor venous circulation



Appearance of wound following 1 application of fish skin graft (FSG) showing granulation tissue formation and greatly decreased inflammation



Complete wound healing resulting in a 3.5 x 1.8 cm scar

# CASE # 2: MELANOMA

Patient History: 77 year old female with poorly-controlled Type II insulin dependent diabetes mellitus

Wound History: Acute surgical wound following wide local excision of melanoma in situ measuring 4.5 x 4.2 cm to the level of the

Kerecis Applications: 3 Applications of fragmented fish skin graft (FSG)

Patient Outcomes: Complete wound healing with no complications in poorly controlled diabetic resulting in 2.0 x 1.8 cm scar



4.5 x 4.2 cm wound to the subcutis s/p wide local excision melanoma

Appearance of wound showing

formation and no surrounding

applications of fish skin graft (FSG)

excellent granulation tissue

inflammation following 3



Excellent granulation tissue formation with minimal surrounding inflammation after 2 applications of fish skin graft (FSG)



Final healed wound measuring 2.0 x 1.8 cm scar

## CASE # 3: MOHS EXCISION WOUND IN A DIABETIC

Patient History: 80 year old female with coronary artery disease, edema, venous stasis disease, and Type II diabetes mellitus

Wound History: Acute Mohs surgical wound following excision of squamous cell carcinoma (SCC) measuring 3.0 x 2.5 cm to the level of the

Kerecis Applications: 3 Applications of fragmented fish graft (FSG) and negative pressure therapy

Patient Outcomes: Complete wound healing with no complications resulting in a 1.5 x 1.8



3.0 x 2.5cm wound to the subcutis s/p Mohs surgery for SCC

2.5cm x 2.5cm wound 1 month

following 3 FSG applications



Granulation tissue with no inflammation or pain after 2 applications of fish skin graft (FSG)



Final healed wound measuring 1.5 x 1.8cm scar

### RESULTS

Complete wound healing was achieved in all three patients. The use of fragmented intact FSG promoted healthy granulation tissue formation despite underlying medical conditions. Similar porosity to that of human skin, allows for rapid fibroblast cell recognition, migration, and proliferation into the FSG. Patient with uncontrolled diabetes mellitus healed in five months with three applications of FSG. Patient with hypertension and peripheral vascular disease healed in four months with four applications of FSG. Patient with extensive venous and arterial vascular insufficiency healed in seven months with ten applications of FSG.

#### DISCUSSION

Lower extremity wounds are challenging to heal. Underlying medical conditions increase the risk of limb loss due to wound closure failure. The use of fragmented FSGs has shown to promote wound healing in these challenging environments and warrants further investigations as a skin substitute in post-excisional dermatologic wounds.

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