INTACT FISH SKIN* FOR TISSUE REGENERATION OF ALL TYPES OF WOUNDS: A CASE REPORT

Oyinem Odumah, MD
Wyckoff Heights Medical Center, Brooklyn NY

INTRODUCTION

Millions of Americans suffer from wounds caused by diabetes and other conditions. Delayed wound healing can lead to infection, debridements, amputations, and death. Different biological materials have been explored for their use in treating various types of wounds, including intact fish skin. Fish skin when grafted to human tissue acts as a scaf-fold for regeneration of the body's cells to form new human tissue. Kerecis, a development and manufacturing company based in Iceland, has been developing products based on fish skin and polyunsaturated fatty acids for cellular therapy, tissue regeneration and protection1. The fish is harvested from North Atlantic waters, making it an ideal eco-nomic situation1. Additionally, because this is a natural product, the chances of infec-tion with grafting is lower than prosthetic grafts. Fish is also considered kosher and halal in their respective cultures, making it culturally acceptable but also with similar or better results compared to alternatives1.

METHODS

The patient is a 53-year-old female who suffered an open left patella fracture and pa-tella tendon rupture 7 months prior. She underwent a left patella open reduction and internal fixation and patella tendon repair then subsequently developed a surgical site infection. The infection was debrided and treated with antibiotics, but the wound nev-er properly healed. She developed skin necrosis, ulceration, & eschar (Figure 1). She had multiple excisional debridements until about 4 months later when she had sharp excisional debridement of the wound & washout intact fish-skin graft & wound vacuum application before being taken to the operating room for a left knee split-thick-ness skin graft with wound vacuum placement.

*Kerecis™, Kerecis, Isafjordur, Iceland

References
"Why Kerecis®?" Kerecis, 15 May 2023, www.kerecis.com/omega3-fishskin/.

CASE: 53-YEAR-OLD FEMALE LEFT PATELLA FRACTURE

Patient History: 53-year-old female with hx of asthma and fibromyalgia

Wound History: Patient sustained an open left patella fracture and patella tendon rupture 7 months prior

Kerecis Applications: Single application of intact fish skin graft

Patient Outcomes: Following a single application of intact fish skin graft incorporated into the wound sup-porting the growth of granulation tissue. STSG was applied to the wound at 1 week following application of intact fish skin graft and achieved 100% closure at 4 weeks

Figure 1: Here is the left knee wound prior to debridement. This patient had previous multiple excisional debridements with administrations of antibiotics.

Figure 2: Here is the wound after excisional debridement and washout.

Figure 3: A close up view of the wound.

Figure 4: A photo of the wound 1 week after intact fish-graft application. The wound bed is better vascularized.

Figure 5: 2 weeks after intact fish-graft application. As you can see, the wound is healing well and better vascularized.

Figure 6: A healthy wound bed is covered with a split-thickness skin graft.

RESULTS

The patient had a 6.5 x 5 x 0.1 cm left knee wound with exposed patella bone, tendon, and hardware (Figure 1). The wound was tangentially debrided to the central portion of the wound to see if there was bleeding, but none was present (Figures 2 & 3). The ex-posed patella tendon was also debrided. The inferior edge of the wound was de-epi-thelialized to improve vascularization of the Kerecis graft.

SurgiClose 7 x 10 cm solid (fenestrated with scalpel) was applied. The Kerecis graft was hydrated using 20 cc of venous blood. The graft was secured with chromic gut su-tures and covered with Adaptic. A wound vacuum was applied and set to 100 mmHg. The patient was sent home with a knee immobilizer. One week after graft applica-tion the wound bed was better vascularized (Figure 4) and two weeks later even more vascularized (Figure 5). 9 days later she had a split-thickness skin graft secured with chromic sutures and wound vacuum set to a pressure of 125 mmHg. The wound bed was healthy and well-vascularized before application of the split-thickness skin graft (Figure 6).

CONCLUSIONS

Fish skin is rich in polyunsaturated fatty acids, lipids, and protein that are known to be anti-in-flammatory, and aid wound healing. Fish skin promotes the recruitment of the body's cells for tissue regeneration. These grafts are biocompatible, have no risk of infection transmission, safe and structurally sound, and are of low-to-medium cost1. These fish skin grafts have been approved for use for chronic wounds, burns, hernia repairs, and breast reconstruction1. The remarkable results are evidently shown in this case pre-sentation.