Fish Skin Graft* to Heal Anterior Ankle Incision Wound Dehiscence: A Case Study

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INTRODUCTION

Healing anterior ankle incisions pose significant challenges due to the unique anatomical factors involved. The region lacks adequate soft tissue coverage, making it susceptible to tension and poor wound closure (1). The relatively thin layer of tissue in this region comprises relatively little blood supply which can impede the healing process. These factors also make it difficult for the immune system to combat infections effectively (2), which make it susceptible to osteomyelitis or worse a BKA. Additionally, most variations of anterior ankle incisions tend to cross angiosomes, further increasing the site's susceptibility to wound dehiscence.

Fish Skin Graft (FSG) is a novel approach to wound healing that has gained significant attention in recent years. The graft's structural similarity to human ECM enables cellular migration and tissue regeneration. Additionally, The omega-3 fatty acids present in FSG possess anti-inflammatory effects (3). Due to its minimal processing, FSG retains the natural collagen structure, bioactive molecules, and growth factors that promote wound healing and tissue regeneration. Clinical observations have shown that wounds treated with FSG exhibit accelerated re-epithelialization, collagen remodeling, and improved wound contraction (4). The goal of this case study is to present evidence of the ability of FSG to heal over an anterior ankle incision wound dehiscence with efficacy.

METHODS

Patient was treated with a total talectomy and replacement with 3D printed talus via an anterior ankle incision. At one month post op, the incision dehisced resulting in a full thickness wound to the level of tendon. FSG was applied to the site, and the incorporating graft and wound was fenestrated at follow up visits.

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CASE : 28-YEAR-OLD FEMALE

Patient History: Patient had a MVA, went only to a chiropractor after the incident who performed manipulations for several weeks. No radiographs were taken prior to office visit. She reported inability to ambulate to the site and severe 10/10 pain. Radiographs showed sclerosis of the talus, after which a CT scan was performed which confirmed osteonecrosis of the talus, which was likely secondary to an untreated talus fracture.

Wound History: A total talectomy and application of 3D printed titanium talus was performed via and anterior ankle incision. At 1 week follow up, the incision began to develop dysvascular changes, and at 1 month post op, wound dehiscence was noted with tendon exposed.

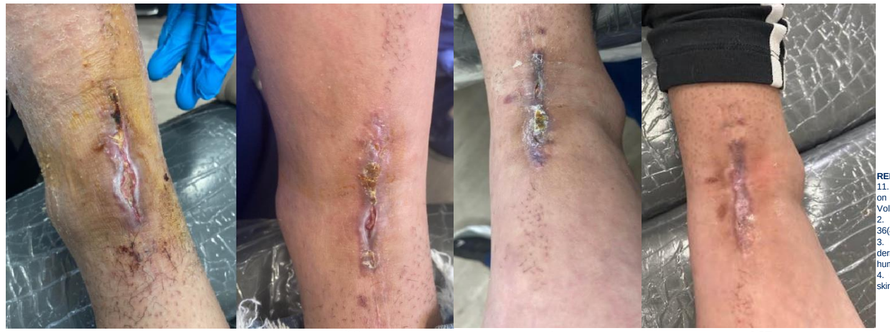
Patient Outcomes: After a single application of fragmented fish skin graft the wound achieved full closure within 4 weeks

Initial radiographs

s/p total talectomy and application of 3D printed talus

3/8

3/30-debridement and fragmented Fish Skin Graft application



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RESULTS

After single application of FSG, within one week significant granulation tissue was noted over the tendon. The wound was fully healed within four weeks.

CONCLUSIONS

Healing anterior ankle incisions are challenging due to limited soft tissue coverage, compromised vascularization, high mechanical stress, and increased risk of infection which result in a high incidence of wound dehiscence. This case study provides promising evidence of the ability of FSG to heal this particular anatomical region with efficacy. Further investigation of its use in this manner is warranted.

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