Addressing Surgical Dehiscence Following Flatfoot Reconstruction Utilizing Acellular Fish Skin Graft: A Case Report

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Introduction

Surgical wound dehiscence presents a significant complication after flatfoot reconstruction surgeries, resulting in delayed wound healing, increased morbidity, and the potential for limb loss. This case report introduces an innovative approach for addressing surgical wound dehiscence in a patient who experienced complications following flatfoot reconstruction, utilizing acellular fish skin grafts.

In the management of chronic wounds, healthcare providers frequently employ advanced allogenic or xenogenic skin graft substitutes to provide coverage for soft tissues. Despite the availability of various treatment options for such wounds, there is limited information regarding the effectiveness of dermal substitutes, including allografts and xenografts. These dermal substitutes are applied to address soft tissue defects, aiming to improve the wound environment, replace lost dermis, and minimize wound contraction.

Piscine acellular dermal matrix (ADM) grafts have gained recognition in the field of wound care due to their native dermal structure, porosity, and biomechanical properties that facilitate rapid cell ingrowth and create a natural bacterial barrier enriched with Omega-3 fatty acids. Omega-3 fatty acids have demonstrated their ability to help wounds transition away from a chronic inflammatory state. The unique properties of fragmented piscine ADM enable direct graft contact even in challenging areas with issues like wound depth, tunneling, and irregular contours that often complicate the application of skin substitutes to host tissue.

A case report illustrating the use of piscine ADM to reconstruct soft tissue in a patient who experienced wound dehiscence following reconstructive surgery is demonstrated.

Methods

A 63-year-old female patient with severe flatfoot deformity underwent surgical reconstruction with internal fixation. Despite meticulous surgical technique, the patient developed surgical wound dehiscence in the early postoperative period. To promote wound healing and prevent limb loss, acellular fish skin graft was utilized to cover the dehisced surgical incision. The grafts were applied in a layered fashion, providing structural support, and facilitating tissue regeneration.

Initial Presentation

Post Application

4 days

1 Week

2 Weeks

5 Weeks

7 Weeks

Results

Following the application of acellular fish skin grafts, the wound showed progressive improvement with enhanced granulation tissue formation and re-epithelialization. The grafts adhered well to the wound bed and successfully integrated, leading to complete wound closure within 7 weeks. The patient achieved a satisfactory functional outcome with no signs of infection or loss of surgical correction.

Discussion

This case report highlights the successful utilization of acellular fish skin grafts in addressing surgical incision dehiscence following flatfoot reconstruction. The unique properties of fish skin grafts, including their high collagen content, bacterial barrier, and structural integrity, contribute to enhanced wound healing and tissue regeneration. The application of acellular fish skin grafts offers a viable option for managing surgical wound dehiscence in complex foot and ankle reconstructions. Further studies are warranted to investigate the long-term outcomes and potential applications of this innovative approach.

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