

Successful Use of Fish Skin Graft in Neonatal and Pediatric Wounds

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INTRODUCTION

Although it is expected for younger skin to heal faster, multicausal factors in acutely ill neonatal and pediatric patients impede wound healing. Surgical management may not be appropriate for unstable patients. Therefore, clinicians face limited options to heal extensive wounds. In this cohort, a fish skin graft (FSG) was applied to three acutely ill infants.

METHODS

A critical preterm infant with necrotizing fasciitis to the right neck, an infant with cardiac repair with a wound to the left inner ankle due to extravasation, and an infant with a post-op tracheostomy wound were treated using FSG. Each wound reached healthy tissue by autolytic debridement. FSG particles mixed with medical-grade honey were applied to the wound beds, covered with a foam dressing, and changed every 3-5 days until healed.

RESULTS

Each wound healed throughout the patient's critical course—complete closure achieved with minimal contracture and scarring. The range of motion was not compromised.

CONCLUSIONS

The case series illustrates the use of FSG in three critical neonatal and pediatric patients with extensive wounds that could not heal by surgical management or skin graft options. The xenograft application was easy to complete at the bedside while patients were in their critical state. The product is displayed to be safe and effective. The application is simple. Final closure of wounds also showed minimal scarring, no contracture, or range of motion limitations. Further studies are needed to help support the use in neonates and children.

CASE 1: NECROTIZING FASCIITIS

Patient History: Critically Ill Preterm Infant not a candidate for surgical intervention or auto skin graft.

Wound History: Full-thickness wound. Autolytic and minimal sharps debridement completed. FSG application x 1. After 3 days of application, dramatic results noted. Dressing changes every 3 days until healed.

Patient Outcomes: Healed in 10 days with minimal scarring.



6/28/22 Patient too unstable for biopsy, surgical debridement or skin graft. Once site declared itself, medical grade honey applied for autolytic debridement.



7/12/22 1.5 cm x 6.5 cm x 0.3 cm. First application. FSG mixed 1:1 with medical grade honey applied. Covered with a silicone border 2x5. White silicone foam bolster secured with cut to fit trach tie.



7/15/22 1 cm x 6 cm. 100% pink tissue buds. Epithelial tissue to wound edges. Ag silicone foam applied to avoid hyper granulation. Silicone border dressing 2x5 applied; secured with a cut to fit trach tie.



7/22/22 Wound 100% epithelialized. Cleansed with hypochlorous acid solution; silicone moisturizer applied BID.



12/22/22 5 mo. 10 days post graft. Soft, flat scar; no restricted ROM. Mother continued BID silicone moisturizer.

CASE 2: FOOT EXTRAVASATION

Patient History: Critically Ill Newborn in Cardiac ICU.

Wound History: Treatment included non-surgical management for wound bed preparation by autolytic debridement. FSG applied weekly x 4 followed by dressing changes every 3-5 days until healed.

Patient Outcomes: Healed in 3.5 months with minimal scarring.



07/17/23 Left foot Extravasation



08/10/23 1.5 cm x 2 cm x 0.4. 40% adherent slough. 60 % pink and red tissue. Decision made to apply graft.



08/10/23 FSG mixed with medical grade honey 1:1. Easy application covered by a silicone border dressing 4x4.



09/28/23 1.5 cm x 1 cm. Wound filled in with red tissue buds. Wound contracting at edges.



11/14/23 Minimal scarring. Calcium deposit noted and removed. Wound edges healed in.

CASE 3: TRACH SITE

Patient History: Neonate with new tracheostomy, critical airway and HFOV.

Wound History: POD #6, FSG applications x 3; applied weekly.

Patient Outcomes: 100% granulation in 12 days. Dressing changes every 3-5 days until healed. Healed in 40 days with minimal scarring results.



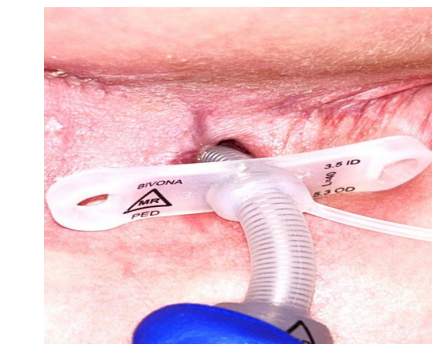
7/19 /23 POD #6 of Tracheostomy Placement. Patient on HFOV. Enlarged wound noted.



7/19/23 Peristomal wound. 2 cm x 1.2 cm x 0.5 cm. Pale pink non-granulation tissue noted.



7/19/23 FSG mixed with 1:1 medical grade honey; FSG mixture applied. Covered with white silicone foam. Secured with trach ties. Dressing in place x 5 days.



8/28/23 Wound edges closed with minimal scarring.



8/28/23 Complete Healing with minimal scarring.

REFERENCES

- Bruno, B., Seymour, M., Mosier, M., Leo, T. Fish Skin Xenografts in the Management of Posterior Heel and Achilles Tendon Wounds. SAWC Fall 2023, November 2023, Las Vegas NV.
- Cherry, I., Tarhini, L., Dean, M., De Buys Roessingh, A. Exploring the Place of Fish Skin Grafts with Omega-3 in Pediatric Wound Management. J Clin Med. 2023 Dec 25;13(1):112. doi: 10.3390/jcm13010112. PMID: 38202119. PMCID: PMC10780036.
- Coprandi, G., Kjarfansson, H., Grossi, F., Baldursson, B. T., Frattolillo, J., Urbani, U., & Zama, M. (2022). Use of acellular intact fish skin grafts in treating acute paediatric wounds during the COVID-19 pandemic: a case series. Journal of wound care, 31(10), 824-831. https://doi.org/10.12968/jowc.2022.31.10.824