

Novel Application of Fish Skin Grafts in Neonatal Wounds

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Introduction

Wounds that arise in neonatal infants often pose unique concerns when approaching options for treatment. Whereas such wounds are inherently acute in nature, wound management in this unique patient population must consider the long-term effects of treatment that will affect the future function of the limb and the aesthetic qualities of a residual scar later in life. Identifying safe and effective dressings to treat complex wounds in this fragile population is often challenging for pediatric wound care specialists.

In this case series, a fish skin graft (FSG) was applied to three neonatal patients with IV extravasation injuries to assess the safety and efficacy of such a product in this age group. The FSGs are a derivative of intact skin obtained from North Atlantic cod. FSGs are effective in the treatment of older children¹, however, no prior experience with this product in neonatal patients has been reported.

Methods

Three neonatal patients (< 30 days of life) with IV extravasation injuries of the extremities are illustrated. All wounds underwent autolytic debridement utilizing Active Leptospermum honey (ALH). Once a viable wound bed was achieved, the FSG was applied at the bedside directly on the healthy wound beds. The grafts were secured with silicone mesh dressings and steri-strips. A secondary layer of petroleum saturated gauze was applied, and the sites wrapped in soft conforming gauze. The primary graft dressings were left in place for seven to ten days without disturbing the underlying graft. Secondary layers were replaced every two to three days to assess for infection and to assess the surrounding tissue for complications. After seven to ten days, the wounds were examined.

Case Descriptions

Case 1

The patient is a 1 day-old 35-week late premature infant female who suffered a severe IV extravasation injury of her right hand. Once a clean and viable wound bed was obtained, the FSG was applied directly over the wound at the bedside. The graft was left in place for 7 days. Upon removal of the supportive dressings, the wound was completely healed and epithelialized. No further advanced wound dressings were required. Follow up one month later revealed the site to be healthy in appearance with no signs of contracture and minimal scar effect.



Case 2

The patient is a 1 day-old 36 week late premature infant male who suffered a severe IV extravasation injury of the left hand. Once a clean and viable wound bed was obtained, negative pressure therapy was applied for seven days to reduce the depth of the wound. Thereafter, the FSG was applied directly over the wound at the bedside. The graft was left in place for 10 days. Evaluation after 10 days revealed smaller yet open wound. Non adherent dressings were reapplied to protect the site for an additional 6 days. Upon reevaluation, the wound was 95% closed and epithelialized. Parents requested discharged home. Follow up 3 weeks later revealed the site to be healthy in appearance with no signs of contracture or other complications.



Case 3

The patient is a 26 day-old 25-week premature infant female who suffered an IV extravasation injury of the right leg. The eschar was easily debrided with ALH. Despite the small size, the cavitory lesion was irregularly shaped that might result in poor aesthetic outcome. A fragmented and granular FSG was chosen to fill the wound space. The graft was left in place for 7 days. Evaluation revealed excellent progress but a persistent open wound. Non adherent dressings were reapplied to protect the site for an additional 7. Upon reevaluation, the wound was 100% closed and epithelialized. No contractures developed and scar tissue was minimal.



Results

In each case, the wounds rapidly healed after a single application of an FSG. No complications were encountered. Full closure was obtained without compromising the range of motion of the extremity. No contractures developed and residual scars were minimal. The parents were extremely pleased with the outcomes.

Conclusions

This case series illustrates the first application of an FSG in the neonatal population. The FSG was easily applied at the bedside, required minimal maintenance, and expedited rapid wound healing after a single application. No complications developed, and residual scars were minimal. FSG reduces scarring and contracture in animal studies and adult clinical trials, but our findings are novel to neonatal patients^{2,3}. The product proved to be a safe and effective option for wound closure and supports additional larger studies for use in neonates and premature infants.

References:

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