# The Healing Power of Noture

## Successful Use of Decellularized Piscine Graft in a Pediatric Extensive Wound Reconstruction Kevin S. Hopkins, MD, FACS, FAAP, Roxana Reyna APRN, CWON-AP, P. Stephen Almond, MBA, MD, FACS Driscoll Children's Hospital, Corpus Christi, TX

### INTRODUCTION

Closing large wounds in children can be difficult. Plastic surgeons may need to use different techniques to achieve final closure. In this pediatric patient, two forms of fish-skin graft (FSG) were used to help fill a significant, post surgical soft tissue defect in conjunction with wound & dermal assisted closure devices. FSG is homologous to human skin, a natural microbial barrier and is used for tissue regeneration. The fish-skin graft stimulates the body's own cells to regenerate, supporting natural healing.

### METHODS

A 5-year-old boy had a large soft tissue defect due to the removal of a giant cell fibroblastoma, which left a significant contour deformity of his right shoulder, neck, and chest down to his muscle and clavicle. To fill the large areas of resected muscle and soft tissue, FSG was applied. A staged reconstruction approach was used to gradually repair the complex wound. A closure-assisted device and negative pressure wound therapy (NPWT) were used to aid in the repair process. Meshed FSG was stacked to fill the defect, and a mixture of FSG particulate and medical-grade honey was applied along with NPWT. With each dressing change, the FSG was incorporated into the wound, and granulation increased over time.

### RESULTS

The FSG was incorporated into the wound, and granulation increased with each dressing change. The FSG allowed the filling of muscle and soft tissue defects to achieve final closure with STSG and autologous skin cell suspension.

### CONCLUSIONS

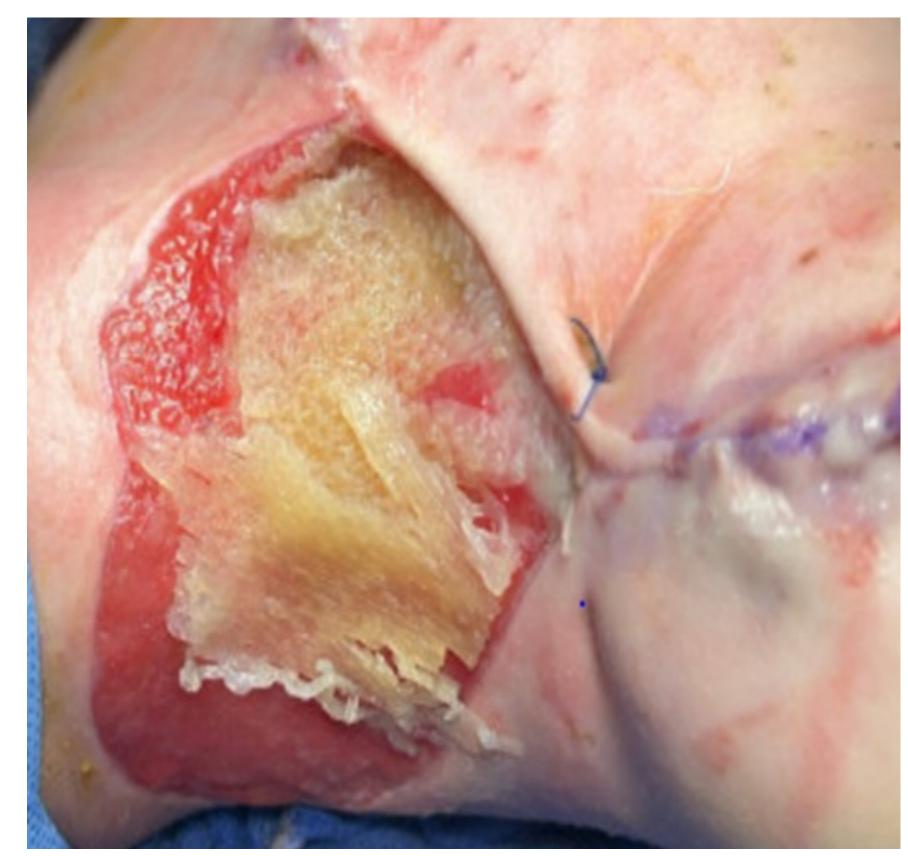
Closing extensive wounds with deep contour deformities can be challenging and may require various techniques. In this case, the use of decellularized piscine skin graft in different forms has shown its benefits in filling large complex wounds and contouring defects. This provides a safe and efficient solution for wound reconstruction in young patients.

Patient History: A 5-year-old boy with wide local excision of the right supraclavicular giant cell fibroblastoma. Excision was made through the pectus, taking the periosteum from the clavicle to the subclavius. Wound History: The resection of fibroblastoma to negative margins left an extended wound and deep contours over the patient's right shoulder, neck, and chest. The wound measures 11.5 x 12.5 cm. Vessels were tied and exposed in the wound bed along with muscle and bone. Wound bed preparation included gaining granulation tissue using two forms of acellular piscine xenograft, Negative Pressure Wound Therapy (NPWT), and a dermal assisted closure device until the wound was ready for split-thickness skin graft (STSG). Fish Skin Graft (FSG) Applications: Day 1: first, a mixture of FSG particulate and medical-grade honey was applied directly over the bone and most depressed area of the defect. FSG mesh was double stacked over the FSG particulate mixture. The dermal-assisted

closure device was used along with NPWT. Day 5; partial closure was achieved. Day 18; second application of medical grade honey and FSG particulate mixture applied. Patient Outcomes: Wound reduced in size, filling defect and deep contours with granulation. Day 32 STSG and autologous skin cell suspension applied. Day 59: Wound healed. The patient completed physical therapy and resumed all his normal childhood activities. At five months post-op visit, the patient states he has no pain and no range of motion restriction noted. The scar is 3 cm wide; the parent continues to apply silicone moisturizer twice a day.



The wound is 11.5 x 12.5 cm.



remaining; left in place. Wound is 6 x 9 cm.



#### CASE : RIGHT NECK EXTENSIVE WOUND RECONSTRUCTION

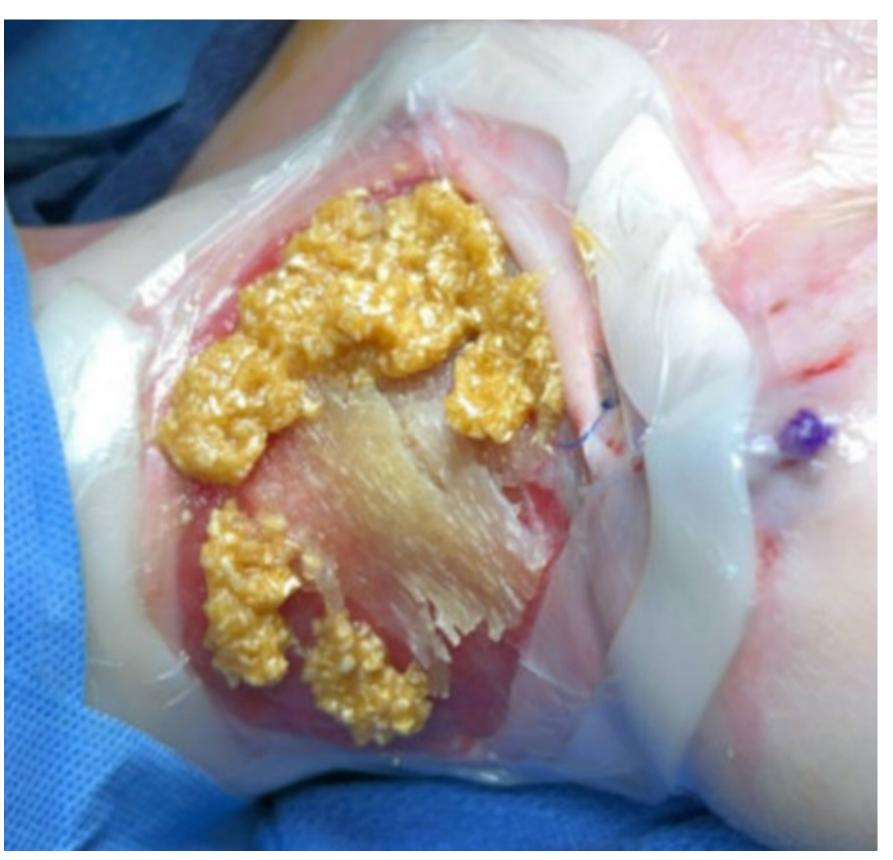
11/9/23 Surgical excision to negative margins.

11/28/23 Day 18; 50% dark pink granulation buds; 50% fish mesh



11/9/23 Day1; first application of medical grade honey and FSG particulate.





11/28/23 Second application of FSG particulate and medical grade honey mixture surrounding mesh graft already in place.

1.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, LasVegas NV. 2. Cherry I, Tarhini L, Doan 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. 3. Ciprandi, G., Kjartansson, H., Grussu, F., Baldursson, B. T., Frattaroli, J., Urbani, U., & Zama, M. (2022). Use of acellular intact fish skin grafts in treating acute paediatric wounds

during the emic: a case series. Journal of wound care, 31(10), 824–831. https://doi.org/10.12968/jowc.2022.31.10.824



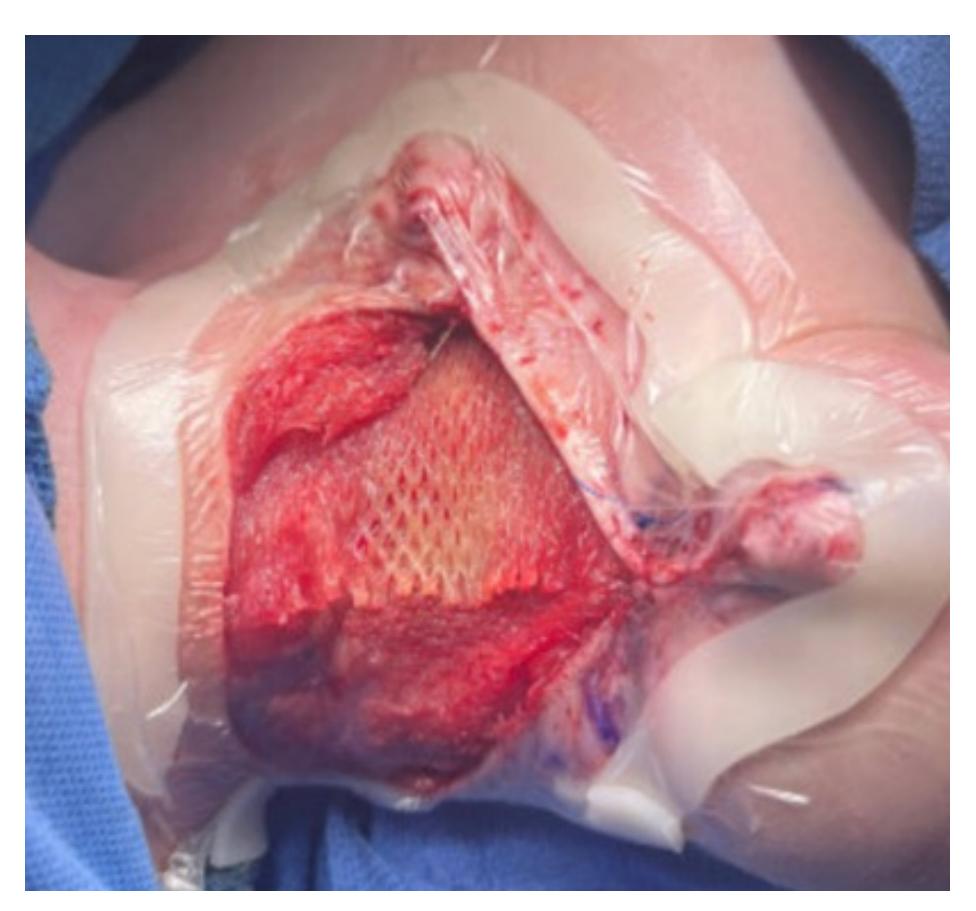
11/9/23 First application of FSG mesh double stacked over FSG particulate



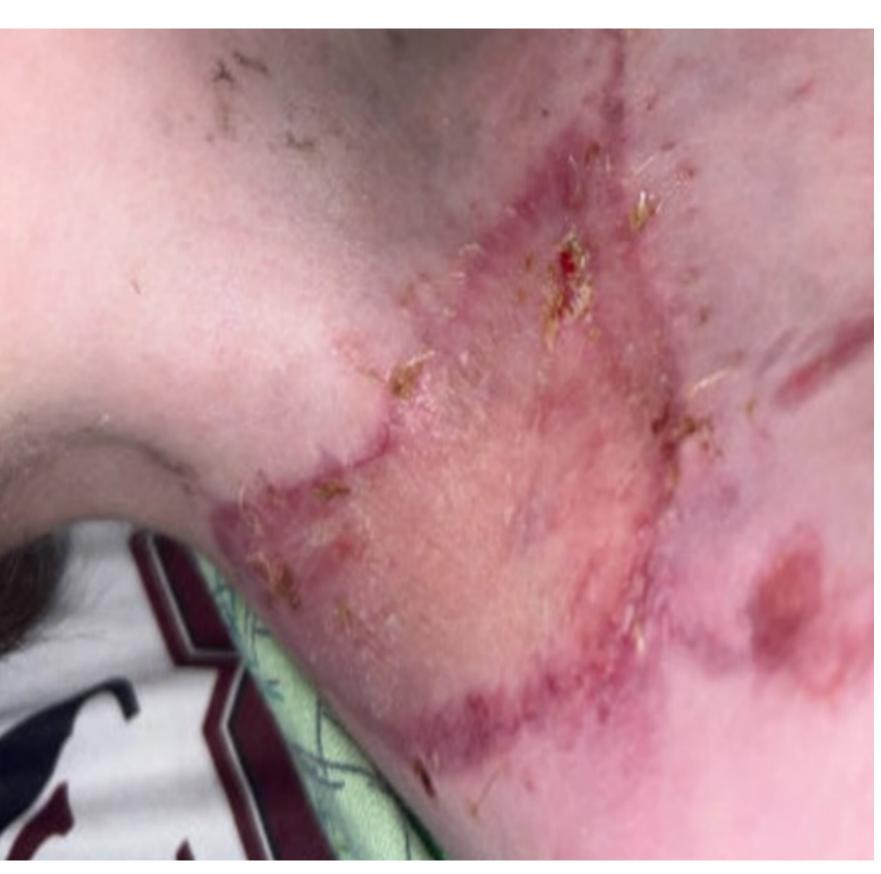
11/14/23 Day 5; integration of FSG over bone, vessel and undermining Granulation present. Closure device clips to wound edge. 6 x 10 x 0.5 cm Undermining 3 cm at 5-9 o'clock position 2 cm 10-1 o'clock



12/19/23 7 days post STSG & spray graft.



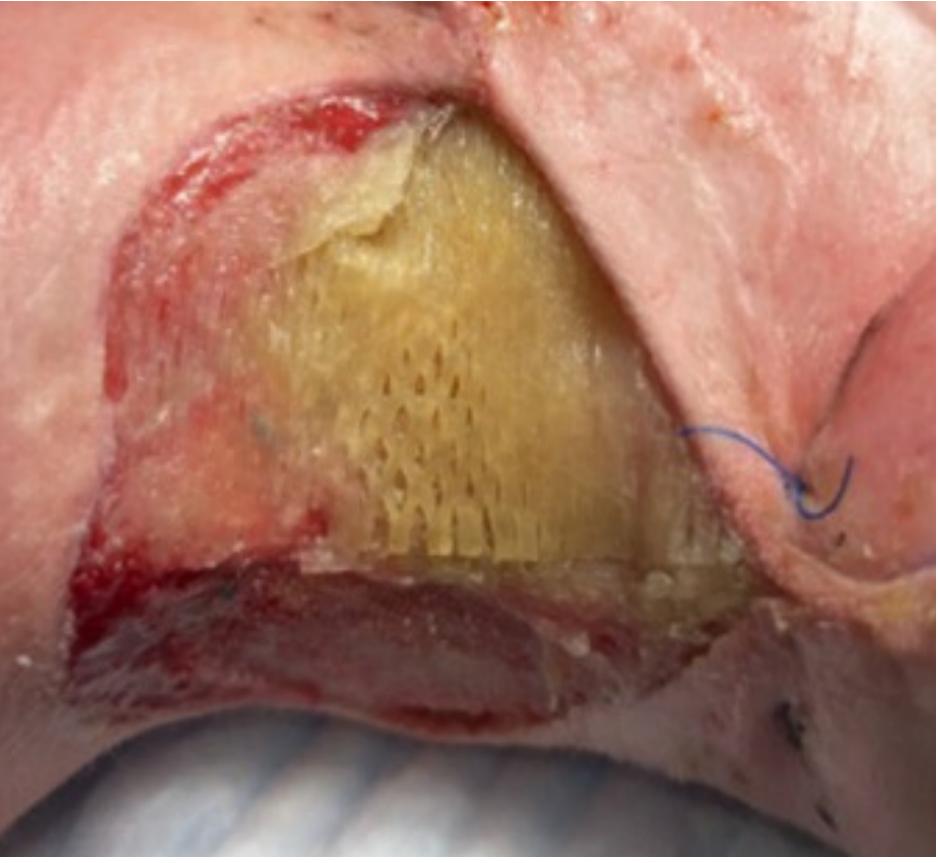
seals to outer edge used to anchor NPWT drape for a secure seal.



1/8/24 Day 59; wound healed/closed. Application of Silicone moisturizer ordered 2-3 times a day.



12/12/23 Wound bed preparation for STSG completed. Wound is 6 x 9cm. STSG, spray on graft & NPWT applied. Contact dermatitis to periwound.



11/14/23 Partial Closure; Wound size 6 x 10 x 0.5 cm. FSG kept in place, protective 11/21/23 FSG 75% integration, granulation tissue and wound filling in. 8.5 x 7 cm.



1/26/24 Scar Transformation. Patient completed Physical Therapy and resumed all his normal childhood activities.