

# Single-Application Fish Skin Grafting for Complex Soft Tissue Injuries: Outcomes and Resource Conservation in Acute Care

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## INTRODUCTION

Complex soft tissue injuries in acute trauma settings present significant clinical challenges and high resource utilization. This case series examines the role of fish skin grafts, applied early or during treatment, in promoting wound closure and conserving resources in complex soft-tissue management.

## METHODS

Three cases were treated at a trauma center: a 41-year-old male with necrotizing fasciitis, a 59-year-old female with pyoderma gangrenosum, and a 16-year-old female with a stage 4 pressure injury. Fish skin grafts were applied early in two cases and later in one. Each wound received a single application of the graft. Wound closure methods included surgical closure with split-thickness skin graft (STSG) for one case and secondary intention healing for the other two. Clinical outcomes, resource use, and anticipated treatment cost were assessed.

## RESULTS

All wounds achieved closure after one fish skin graft application. The surgically closed case used STSG following grafting, while the other two healed by secondary intention. This approach reduced the need for multiple graft applications, complex dressings, and operating room visits. Consequently, treatment costs and resource demands were controlled effectively.

## CONCLUSIONS

Single-application fish skin grafts facilitate efficient wound closure in complex soft-tissue injuries, particularly when applied early in treatment. This case series highlights the potential to improve patient outcomes while reducing resource utilization in acute care. These findings warrant further study to optimize protocols and broaden clinical use in trauma centers.

### CASE #1: Necrotizing Fasciitis

**Patient History:** IVUD, Smoker, Hypothyroidism

**Wound History:** Presented 4 days after symptom onset; underwent excisional debridement, NPWTi-d with HOCl, then fish skin grafting

**Kerecis Applications:** 1 piece fenestrated, 1 piece meshed

**Patient Outcomes:** after 2 weeks, tendon and muscle was covered with granulation tissue and wound was closed with STSG.

Approach	Total Cost
Actual Treatment Approach	\$24,250
Comparison Treatment Approach	\$37,300



Left arm on presentation

Left arm after NPWTi-d



Left arm after Fish Skin Grafts

Left arm closed (2 months)

## REFERENCES

- Winters C., et al. Wounds (2020), 32(10):283-290
- Kerecis vs EPIFIX: R. S. Kirsner et al. Wound Rep Reg (2020), 28 75-80.
- Vick, D. O., Walker, D. M., & O'Connell, K. A. (2018). Clinical and economic considerations in negative pressure wound therapy: A review. Journal of Wound Care, 27(4), 202-210. <https://doi.org/10.12968/jowc.2018.27.4.202>

### CASE #2: Pyoderma Gangrenosum

**Patient History:** Developed large, painful abdominal wound after laproscopic colostomy creation

**Wound History:** infected upon admission. One OR debridement, then graft and NPWT

**Kerecis Applications:** 1 piece meshed

**Patient Outcomes:** NPWT was used to bolster for a 2-week period, then transitioned to local wound care with non-adherent dressings at home. Had complete resolution of the wound by 8 weeks.

Treatment Approach	Total Cost
Actual with OR graft + VAC + dressings	\$10,464
Alternative with frequent OR dressing changes + foam + lidocaine	\$19,880



Abd Wound on presentation

Meshed Fish Skin Graft



6 weeks after application

Closed at 8 weeks

### CASE #3: Stage 4 Pressure Injury

**Patient History:** 16 yo with CP, chronic PI of the ischium

**Wound History:** Attempted local wound care at home, admitted for surgical debridement, aggressive offloading, & IV antibiotics.

**Kerecis Applications:** one application of micro fish skin graft into tunnel

**Patient Outcomes:** Closed wound within 11 days

Treatment Approach	Total Cost
VAC therapy 3x/week for 7 weeks	\$10,500
Kerecis Micro application + VAC 2 weeks	\$3,400



PI on presentation (5 cm tunnel)

PI after 5 weeks of NPWT (5 cm tunnel)



PI 11 days after one application of micro (no tunnel)