Definitive Coverage and Closure of Left Lower Arm, Post Traumatic Injury Amputation, Full-Thickness Wound, with a Next Generation Decellularized Dermal Allograft

Dean W. Smith MD, Houston, TX Board Certified, American Board of Orthopaedic Surgeons Certificate of Added Qualifications in Hand Surgery

Surgical Summary

DERMA [PURE] dCELL technology

Clinical Presentation:

- A 32-year-old left hand dominant and previously healthy male presented to hand clinic after a left lower arm traumatic crush amputation injury just below the elbow joint. His original emergent surgery was performed in Chihuahua, Mexico nine weeks earlier, after he had suffered a rollover accident at his family's ranch while driving a dune buggy, however, his lower arm was unable to be salvaged, and a surgical amputation had been performed over the proximal forearm.
- From his initial surgery, a large anterior skin flap with limited blood supply had been created in order to save his elbow. This skin flap went on to necrosis. Upon initial presentation to our hand clinic, he had been undergoing range of motion (ROM) exercises and daily wound care management.
- Current Medications: LyricA® 75 mg BID, Bactrim DS 800-160 mg BID, UltraCEy® 37.5-325 mg q 4 hours PRN severe pain.
- Exam revealed: A large full thickness wound to his left lower arm stump with 100% eschar, measuring 10 cm x 8 cm. Peripheral drainage clearly visible around the eschar. There were no signs of fever, redness, or odor (Figure 1).
- Surgical recommendation: eschar debridement and placement of DermaPure® decellularized dermal allograft for wound coverage.

Intraoperative Findings:

- Surgical debridement of the eschar to the left lower arm amputation site revealed a full thickness wound with exposed sub-dermal tissue measuring 10 cm x 8 cm (Figure 2).

Figure 1.

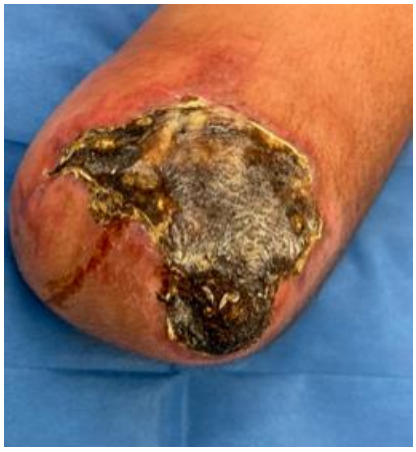

Figure 2.

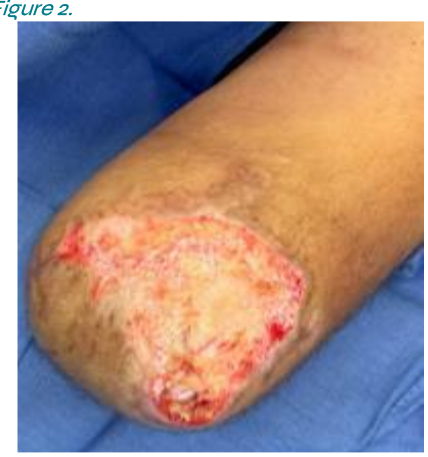

Figure 3.

Surgeon Perspective:

"DermaPure® was utilized to cover the area needing replacement of tissue. The patient's own skin grew on top of the matrix from the surrounding borders without the need for a STSG."

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Surgical Procedure:

- The left lower arm extremity was draped/prepped in the usual sterile fashion, and a well-padded tourniquet was applied at 250 mmHg.
- The necrotic tissue on the left lower arm stump wound was debrided down to healthy sub-dermal tissue and freshened with #15 scalpel blade. There was no evidence of any active infection and hemostasis was achieved with electrocautery. The full-thickness wound measured 10 cm x 8 cm.
- One 7 cm x 10 cm DermaPure® Meshed decellularized dermal allograft was cut to size with a #15 scalpel blade and secured to the wound using surgical staples (Figure 3).
- Xeroform was placed on the wound, followed by a moistened bolster dressing.

Figure 4

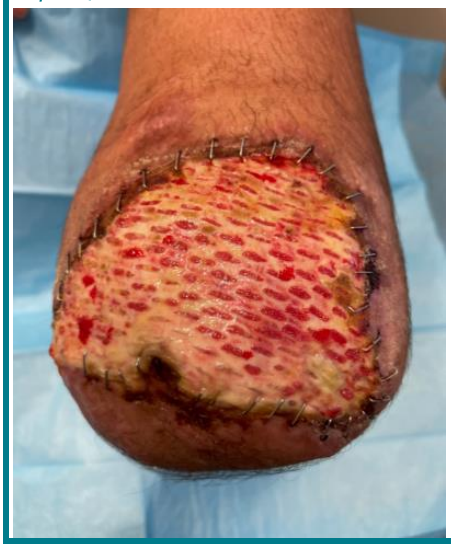


Figure 5

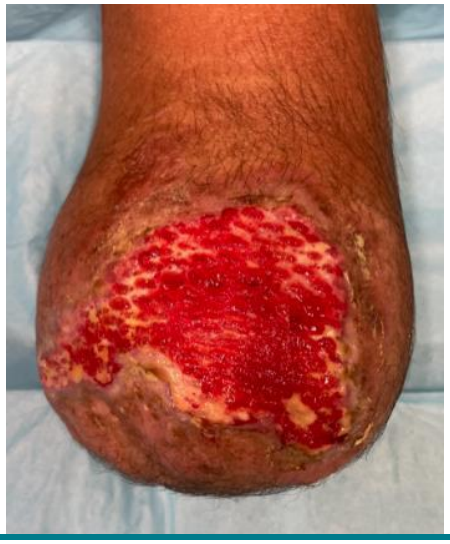
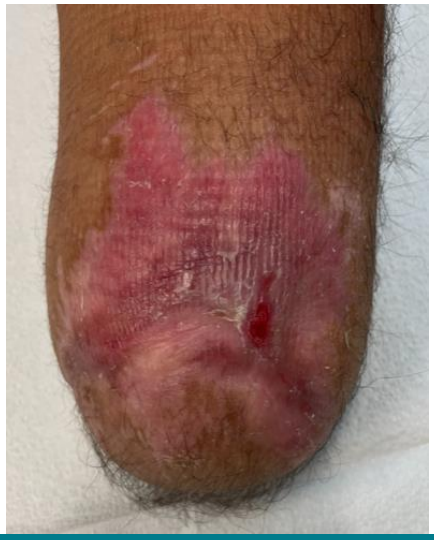


Figure 6



Post-Operative Notes:

- Week 2 post-op: DermaPure® appeared to be taking well and remained firmly adhered to the wound bed (Figure 4). Staples were removed and a moist wound dressing environment was maintained.
- Week 4 post-op: DermaPure® showed substantial integration. Healthy granulation tissue presents with early reduction in the wound surface area (Figure 5).
- Week 14 post-op: DermaPure® is fully integrated and covered with healthy new skin growth. His amputation stump was significantly smaller (Figure 6), while his elbow ROM had improved, and he reported no pain.

Plan: Continue stump wrapping in preparation for prosthetic fitting. Follow-up was scheduled with a Physical Medicine & Rehabilitation (PMR) physician to review prosthetic options and functional management as a below elbow amputee.