

Bovine-Derived Collagen Matrix as an Adjunct for Post-Amputation Diabetic Foot Wound

Dehiscence: A Two-Case Review

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Introduction

Post-operative wound dehiscence following foot amputation is a significant challenge in patients with **diabetes** and **peripheral arterial disease (PAD)**, who often experience impaired perfusion, neuropathy, chronic inflammation, and diminished immune response that hinder normal wound healing and **increase the risk for infection, delayed recovery, and progression to higher-level amputation**. When dehiscence occurs, particularly with depth, tunneling, or exposed subcutaneous tissue, wounds frequently become chronic and require advanced interventions beyond standard care. **Bovine-derived collagen matrices** have emerged as an adjunct to wound care in complex cases and have demonstrated potential in supporting granulation tissue formation and epithelialization in compromised wound beds; however, clinical evidence specifically evaluating their role in postoperative wound dehiscence remains limited. This case series demonstrates the adjunctive use of a bovine-derived collagen matrix in dehisced post-amputation diabetic foot wounds closed with a **single application** following surgical debridement.

Methods

Two medically complex patients with **dehisced post-amputation** diabetic foot wounds were retrospectively reviewed, both demonstrating depth and increased susceptibility to delayed healing. Assessment of size, depth, tunneling, tissue viability, drainage, and local or systemic infection. Surgical sharp debridement was performed at presentation to remove nonviable tissue and prepare the wound bed. Immediately after debridement, a **single 500 mg bovine-derived collagen matrix*** was applied to the wound bed and any tunneling tracts. Mechanical offloading using a CAM boot or Charcot Restraint Orthotic Walker (CROW), based on patient need, was maintained throughout healing. Standard wound care, including protective dressings, serial measurements, and infection surveillance, continued.

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Case Presentation

Case 1: Chopart Stump Dehiscence (Post-surgical Wound Presentation)

A 57-year-old male with **type 2 diabetes** and prior **right below-knee amputation** presented two weeks after a left Chopart amputation with a **dehisced** full-thickness defect measuring **6.1 × 1.5 × 4.1 cm** and **4.1-cm tunneling**. The wound was fibrogranular with serous drainage and had failed standard care, including Negative Pressure Wound Therapy (NPWT).



Day 0: Surgical debridement + Bovine collagen matrix	Day 6	Day 20	Day 27	Month 5: Complete closure maintained
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Day 6: volume was reduced by ~ 95% with depth improving from 4.1 to 1.2 cm. **Day 20:** volume reduction reached 99% with tunnel depth reduced to 0.2 cm. **Day 27:** wound **fully granulated** without tunneling. Full closure at Month 4 and remained stable at Month 5 follow-up **without recurrence or signs of infection**.

*Bovine Collagen Matrix, **HELIOGEN®**, MIMEDX Group Inc, Marietta, GA, US

Case 2: Transmetatarsal Stump Dehiscence

A 65-year-old male with **type 2 diabetes**, **PAD**, **peripheral neuropathy**, **chronic hepatitis C**, **HIV**, and **coronary artery disease** presented two weeks after a right transmetatarsal amputation with a **dehisced lateral stump** wound measuring **3.5 × 2.5 × 1.5 cm** and a concurrent dorsal foot eschar measuring **1.0 × 0.5 × 0.5 cm**, both with full-thickness tissue loss.

Healthy granulation was observed by **Day 5** without infection. **Day 12:** the dorsal wound **fully closed** and the lateral stump wound achieved **~99% reduction**. **Day 19:** reduction reached **~99.9%**, with **complete epithelial closure** documented at **Day 61**.



Day 0: Surgical debridement +Bovine collagen matrix	Day 5
Day 12: ~99% reduction; lateral wound; dorsal wound closed	Day 19
Day 61: Wound remained Closed	

Conclusion

This retrospective review highlights the adjunctive use of a **bovine-derived collagen matrix** within standard care for dehisced post-amputation diabetic foot wounds, with response after a **single application** and progression toward closure following appropriate offloading. Further evaluation in larger patient groups is warranted.