

## ALLOGENEIC GRAFTING FOR WOUND REPAIR

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## OVERVIEW

Chronic, non-healing ulcerations of the lower extremity are of great concern as they can lead to bone infection and subsequent limb loss. Through the advent of various types of allogeneic grafting, increased healing rates have been observed. Advanced treatment modalities are particularly useful when dealing with chronic wounds that are nonresponsive to traditional wound care. This is often the case with patients that have multiple comorbidities including poorly controlled diabetes and Charcot deformity. The American Diabetes Association estimates that 85% of all lower extremity amputations are preceded by foot ulcerations.<sup>1,2</sup>

Many options for allogeneic tissue grafting have been used for treating chronic nonhealing ulcerations, but their success has proven unsatisfactory in many cases. The use of GRAFTJACKET Matrix (Wright Medical Technologies, Arlington, TN), an acellular dermal regenerative tissue matrix, has been studied and proven very effective for the treatment of nonhealing ulcerations. Recent studies have evaluated the percent and rate of wound closure. The average time to healing through a single application of GRAFTJACKET Matrix for complex wounds ranged from 7-11 weeks.<sup>3,4</sup>

In one study, at 4 weeks, 73% of the overall wound with 89% of the wound depth was healed with the use of GRAFTJACKET Matrix, weekly wound care, and off-loading.<sup>5</sup> Another study demonstrated complete wound closure in 85.7% of patients (12 of 14 patients) at 16 weeks.<sup>6</sup> Due to the rapid rate in healing, a secondary incentive for use of this regenerative acellular scaffold is the reduction in treatment cost.<sup>2,7</sup> In fact, clinical data demonstrate that treatment that includes the GRAFTJACKET Matrix shows that the body can repair the wounds at an 82-87% effectiveness rate.<sup>8</sup> In a multicenter study of 100 wounds, healing was achieved in 91% of patients with challenging complex wounds.<sup>9</sup>

GRAFTJACKET Matrix works by allowing healing at deeper levels while protecting the external layer of the wound with a graft material that facilitates tissue regeneration capability which converts to functional host tissue. It contains collagen 1, 3, 4 and 7, elastin, hyaluronan, fibronectin, blood vessel channels, and proteoglycans, that are available for use by the body as it

repairs itself. It also contains vascular channels and preserved extracellular matrix, which allow for rapid revascularization and repopulation leading to rapid granulation tissue formation.<sup>2,8,10</sup>

The application of GRAFTJACKET Matrix for these challenging, chronic wounds is a simple, stepwise procedure. The basic principles include preparing the wound bed with debridement of all nonviable tissue, preparing the graft for implantation via rehydration with sterile saline, applying and affixing the graft to the wound bed with either sutures or staples, and finally applying a moistened mineral oil compression dressing to manage wound exudates (Figure 1).

Postoperatively, weekly wound care and dressing changes are performed with adequate off-loading.

## CASE PRESENTATIONS

## Case 1

The patient is a 68-year-old diabetic man who presented with chronic venous stasis ulcerations on bilateral ankles/lower legs. At the initial visit, he related that the ulcerations began as small blisters/wounds of the medial ankle. He initially tried Silvadene cream but the wounds continued to get larger. His medical history included lung disease, hypertension, and arthritis. He had a 6-year history of ulcerations on the lower extremity that had been treated unsuccessfully with serial debridements and Unna boots. Over this period of time, no wound grafting was implemented.

Upon initial evaluation of the current wounds, all were

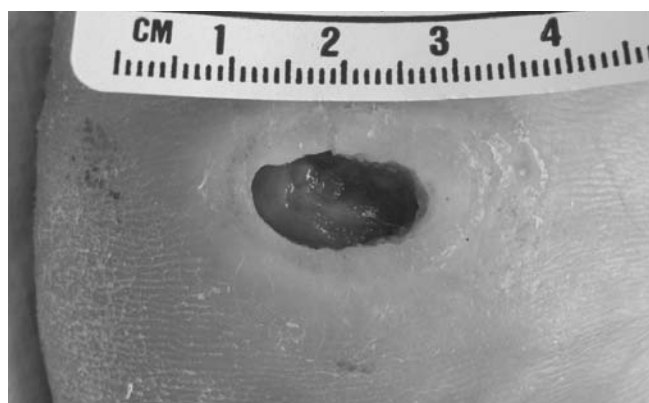


Figure 1A. Preoperative plantar Charcot foot wound.

full-thickness venous stasis ulcerations. Initial treatments of these wounds included serial debridements, moist to dry dressings, Oasis grafting, compression dressings, compression pumps, and antibiotic therapy. After 3 months of clinical wound care and severe noncompliance, the wounds significantly worsened.

Surgical application of GRAFTJACKET Matrix was then implemented after many months of continued

progression and regression of the ulcerations. Preoperatively, the ulcerations (wounds 1-3) measured 33 x 17 x 2mm, 58 x 51 x 2mm, and 11 x 10 x 2mm (Figure 2). One week postoperatively, the graft sites demonstrated signs of improvement. The patient was seen weekly for dressing changes and all wounds were healed at 10 weeks (Figure 3).



Figure 1B. Debridement of nonviable tissue and wound peripheral.



Figure 1C. Rehydration of GRAFTJACKET Matrix.



Figure 1D. Removal of paper backing from the graft.



Figure 1E. Sizing and trimming the graft.



Figure 1F. Affixing the graft with sutures.



Figure 1G. Final graft placement.



Figure 1H. Application of compression dressing.

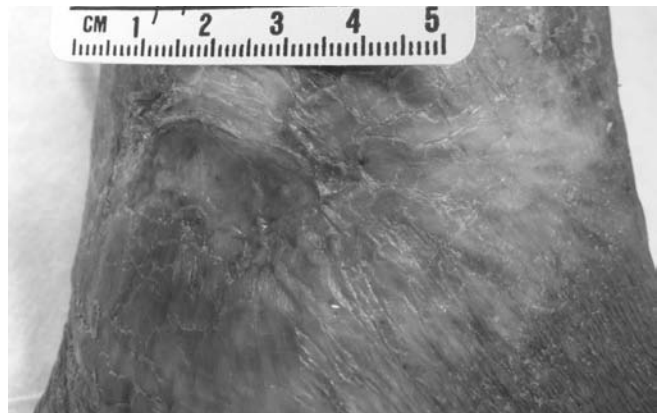


Figure 2A. Preoperative left medial ankle wound 1.

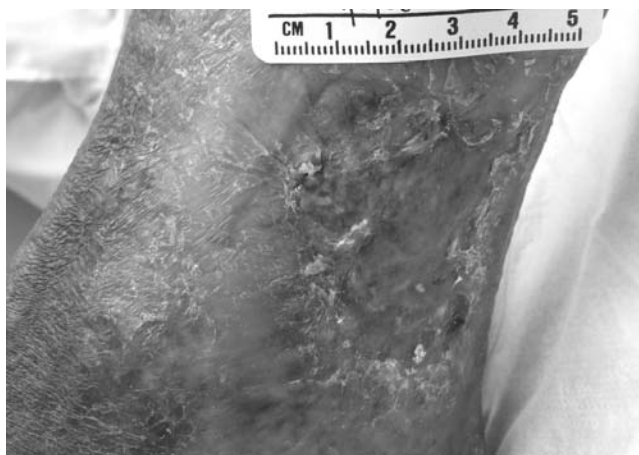


Figure 2B. Preoperative right medial ankle wound 2.

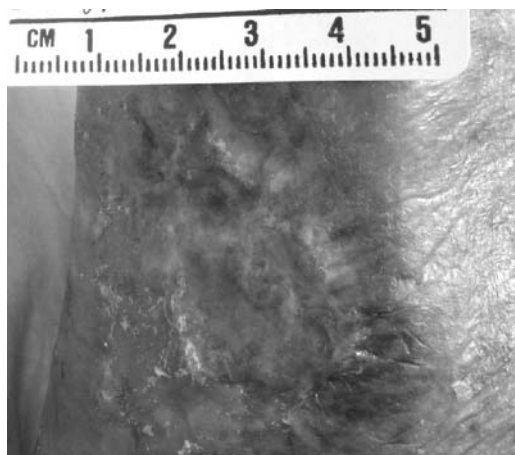


Figure 2C. Preoperative right lateral ankle wound 3.



Figure 3A. Healed left medial ankle wound 1.



Figure 3B. Healed right medial ankle wound 2.

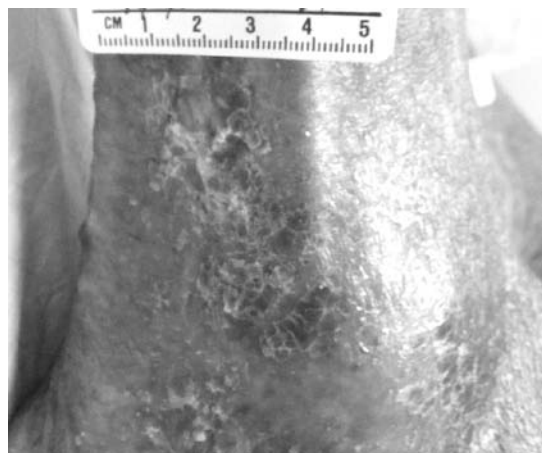


Figure 3C. Healed right lateral ankle wound 3.

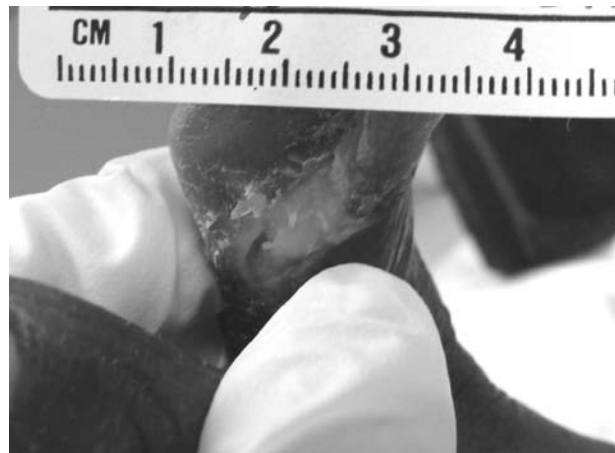


Figure 4. Preoperative hallux wound.



Figure 5. Healed hallux wound at 6 weeks.

## Case 2

This 68-year-old diabetic woman presented with an ulceration on the lateral hallux. She had been using a silicone digital separator that appeared to have exacerbated the ulceration as it was keeping the area moist. Her history included sarcoidosis, COPD with oxygen therapy, congestive heart failure, and insulin-dependent diabetes.

Upon initial evaluation, the hallux wound was full thickness and measured 15 x 10mm. Treatments for the ulceration included serial debridements, moist to dry dressings, Hydrogel dressings, Oasis grafting, and antibiotic therapy. After 4 months of no improvement and continued pain, GRAFTJACKET Matrix was applied in a surgical setting. The preoperative wound measurement was 15 x 10 x 2mm (Figure 4). At her 1 week postoperative visit, the wound showed significant signs of improvement. At 6 weeks postoperatively, the wound was healed (Figure 5).

## SUMMARY

The GRAFTJACKET Matrix has proven to be durable, well accepted by the host tissue, and an ideal scaffold for use in chronic wounds. Though the use of GRAFTJACKET Matrix, studies have determined the product's unique ability to rapidly increase the rate of healing and thus decrease the chance of opportunistic infections. Clinical studies have demonstrated time and again implementation of GRAFTJACKET Matrix can potentiate the healing of these longstanding, difficult-to-heal wounds.<sup>9</sup>

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