Application of Human Allograft Adipose Matrix* for Prevention of Recurrent Diabetic Foot Ulcerations

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INTRODUCTION

Diabetic foot ulcerations are challenging given their multifactorial complexity and high propensity for recurrence. Recurrent ulcerations increase the risk for infections that may lead to amputations, with resultant functionality impairments increasing patient mortality rates. Additionally, recurrent ulcerations can occur in areas with a deficient subcutaneous adipose layer over bony prominence. Treatment options generally involve the use of padding and offloading techniques, but these have been shown to fail with patient non-compliance. Allograft adipose matrix (AAM) is an "off-the-shelf" treatment option that can provide a natural cushion to support the deficit adipose tissue layer. This case series examines how AAM can cushion a deficit subcutaneous adipose layer, which may prevent incidence of recurrent ulcers.

METHODS

Case 1 is a 58-year-old male with a recurrent diabetic ulcer to the plantar medial aspect of the left hallux. Despite multiple off-loading attempts for the last 5 years, the ulcer has reoccurred. This time, the ulcer extended down to the bone with localized cellulitis. Biopsy confirmed no underlying osteomyelitis or malignancy.

Case 2 is a 86-year-old male with a recurrent diabetic ulcer to the plantar aspect of the left first metatarsal for 1 year. The wound extended down to the subcutaneous tissue.

Case 3 is a 73-year-old male presenting with a recurrent diabetic ulcer to the plantar aspect of the left fifth metatarsal for 1 year.

Surgical closure of the wound was achieved with a local rotational flap technique. Once the surgical site was resolved in all cases, 1.5cc of AAM was applied subcutaneously to the area of recurrent ulceration in the office setting and patients were followed up for recurrence of ulcerations.

RESULTS

In all cases, no recurrence of diabetic ulcers were noted after single application of AAM. The timespan no reulceration is from 7 months to 2.5 years.

DISCUSSION

The use of AAM may be an effective modality to assist in preventing recurrent ulcerations by supporting a well-cushioned subcutaneous layer with this at-risk population.

*Leneva® (MTF Biologics, Edison, NJ)

CASE 1

Patient Information: 58 year-old male, DMII with peripheral neuropathy, obesity.

Wound History: History of recurrent ulceration to the plantar medial aspect of the left hallux for the past 5 years despite multiple offloading attempts under the care of a different physician.

Treatment: On initial presentation, the wound extended down to the level of the bone with localized cellulitis. Biopsy confirmed no underlying osteomyelitis or malignancy, wound was closed utilizing local advancement flap technique. Treated with AAM (1.5cc) subcutaneously.

Outcomes: 2.5 years no recurrence of ulceration (with only single treatment)



Figure 1A: Day 0
Initial Presentation



ure 1B: Intra-op



Figure 1C: 2 weeks Figure 1D: 8 weeks later



Figure 1E: 2 weeks post-treatment of 1.5cc of AAM



Figure 1F: 9 months posttreatment



F: 9 Figure 1G: 2.5 years postosttreatment. No recurrence of ulcerations at wound

CASE 2

Patient Information: 86 year-old male. DMIII with peripheral neuropathy, CAD, cardiac stented, cataract excision, former smoker (20yrs history, quit in the 1990s).

Wound History: History of recurrent wound to the plantar aspect of the first metatarsal head for 1 year duration despite multiple of floading attempts. Presented with plantar first metatarsal head ulceration.

Treatment: Patient admitted with localized cellulitis, plantar first metatarsal wound extending down to fascia. Biopsy confirmed no underlying osteomyelitis or malignancy, wound was closed utilizing local advancement flap technique. Treated with AAM (1.5cc) subcutaneously. **Outcomes**: 1.5 years no recurrence of ulceration (with only single treatment)



Figure 2A: Day 0
Initial presentation



Figure 2B: Intra-op view of local flap advancement



Figure 2C: 2 weeks post -op



ure 2D: 6 weeks postp. At this point, 1.5cc M treated in the office setting



Figure 2E: 4 months post treatment of 1.5cc AAM.
No recurrence of ulcerations to wound site.



Figure 2F: 1.5 years post treatment of 1.5cc AAM. No recurrence of ulcerations to wound site.

CASE 3

Patient Information: 73 year-old male. DMIII with peripheral neuropathy, cardiac stented, non-smoker.

Wound History: Presented to wound center with recurrent diabetic wound to plantar aspect of left fifth metatarsal head. Wound closed and recurred for a year despite multiple offloading attempts.

Treatment: On initial presentation, the wound demonstrated extension down to the level of the fascial tissue. Wound was closed primarily utilizing local advancement flap technique. 1.5cc AAM was injected subcutaneously.

Outcomes: 7 months no recurrence of ulceration (with only single treatment)

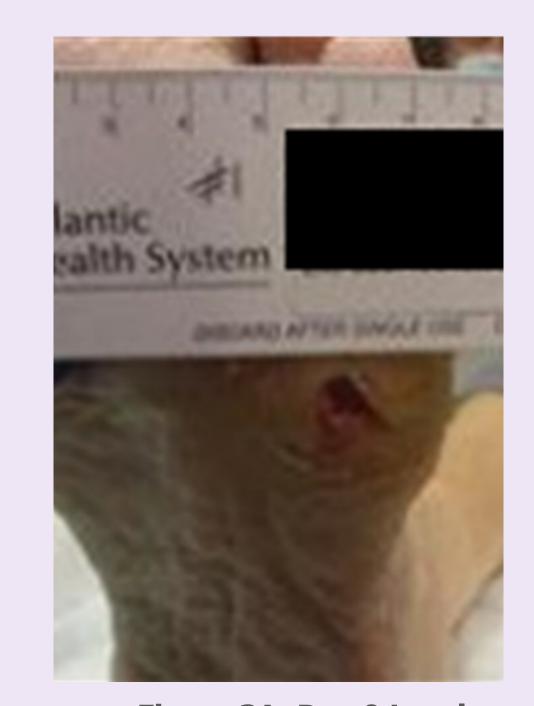


Figure 3A: Day 0 Local advancement of flap



op demonstratin



op. 1.5cc AAM treat the office setting



Figure 4C: 7 months no recurrence of ulcerations to wound