Use of Hypothermically Stored Amniotic Membrane on Diabetic Foot Ulcers- A Multicenter Retrospective Case Series

Anna Sanchez; DPM;[1] Alan Hartstein, DPM, FACFAS, DABWM;[2] Hisham Ashry, DPM, MS, FACFAS, CWS;[2] Maryam Raza, MD, CWSP[3]

[1] San Antonio New Step, San Antonio, TX; [2]Palm Beach Foot and Ankle, Palm Beach Gardens, FL; [3]Homeheal P.A., Red Oak, TX

INTRODUCTION

- Diabetic foot ulcers (DFUs) are one of the most common types of chronic wounds.[1]
- The pathophysiology of DFU's is multifactorial, stemming from conditions such as neuropathy, vasculopathy, immunopathy, deformity and mechanical stress.[2]
- Diabetes-related ulcers requiring amputation carry a 5-year mortality risk that is higher than many common forms of cancer[3], presenting a considerable health care burden and impact to patient quality of life.[4]
- Hypothermically stored amniotic membrane (HSAM)[(a)] is a human placental allograft composed of fresh amniotic membrane that retains its native extracellular matrix (ECM) scaffolding, proteins, and viable cells.
- HSAM is intended for use as a protective barrier in the management of acute and chronic wounds, including DFUs.
- In a prospective, randomized controlled trial comparing the efficacy of (HSAM) plus standard of care (SOC) to SOC alone, HSAM demonstrated a significantly higher frequency of decreased time to wound closure.[5]
- The aim of this multicenter, retrospective case series is to expand on this knowledge and report on the outcomes of DFUs receiving HSAM.[6]

[(a)]Affinity, Organogenesis Inc., Canton, MA

METHODS

- Deidentified case data of 50 patients who received HSAM as part of the course of treatment for a DFU were obtained from 7 wound care provider offices across the US.
- Data was collected beginning at the first visit of the patient to the wound care site (first presentation), at the visit in which first HSAM application occurred (baseline), and at each subsequent visit over the 12 weeks of treatment (follow-up).
- All patients received standard of care (SOC) treatment between first presentation and baseline, consisting of debridement and offloading with moist wound care.
- All data obtained from each patient case was entered via an electronic case report form within an Imaging Analysis Product (Net Health Tissue Analytics, US).
- Inclusion criteria comprised of patients required to have a partial- or full-thickness DFU; a DFU that was 0.25–40 cm^2 at baseline; completed 12 weeks of follow-up care after the start of treatment (12 weeks of follow-up was not required if wound closure was attained in <12 weeks).
- Patients excluded from this case series were those individuals who were treated with other skin substitutes 14 days prior to initial HSAM treatment; had missed >1 consecutive week of wound measurements during follow-up; had an ulcer with an active infection; or who had received immunosuppressive agents, radiation therapy or chemotherapy within 14 days of the start of the study.

STATISTICAL ANALYSIS

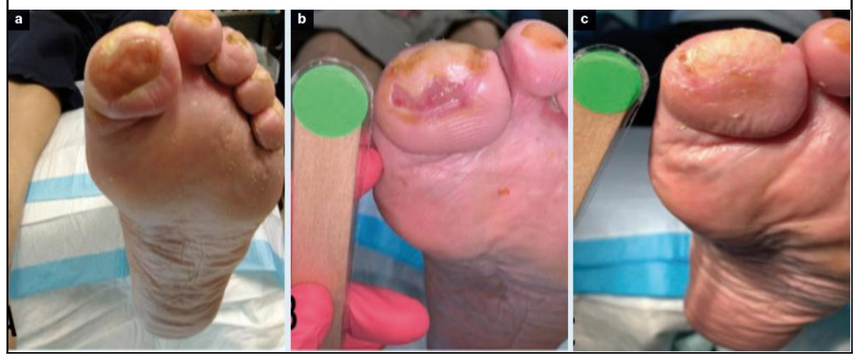
- Descriptive summaries of variables were provided where appropriate and no statistical tests were performed.
- For continuous variables, the number of non-missing values (n) and the mean—standard deviation, minimum, median and maximum were tabulated.
- For categorical variables, the counts and proportions of each value were tabulated.
- Time-to-event summaries were provided using Kaplan–Meier (K-M) methods.

TABLE 1. BASELINE WOUND CHARACTERISTICS

Parameter	Total (n=50)
Wound Location, n (%)	
Calcaneal	9 (18.0)
Dorsal Foot	1 (2.0)
Lateral Foot	2 (4.0)
Plantar Foot	23 (46.0)
Toe	11 (22.0)
Other	4 (8.0)
Wound Depth on Wagner Scale (1-5), n (%)	
2: Full-Thickness to Subcutaneous Tissue	46 (92.0)
3: Full-Thickness to Muscle and/or Fascia	2 (4.0)
5: Full-Thickness to Bone	2 (4.0)
Wound duration at first presentation, n (%)	
<6 months	44 (88.0)
6 months-1 year	4 (8.0)
>1 year	2 (4.0)
Wound Treatment Duration pre-HSAM, n (%)	
≤4 weeks	23 (46.0)
>4 weeks	27 (54.0)

PATIENT 5

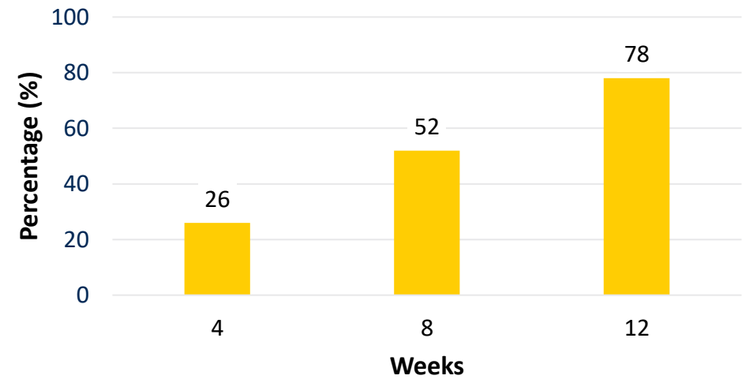
83-year-old Hispanic male with a history of type 2 diabetes, peripheral neuropathy, and hyperlipidemia presented with a diabetic foot ulcer (DFU) located on the left hallux. DFU presentation at first application of HSAM (a); DFU presentation halfway through treatment (fifth HSAM application) (b); Closure at week 10 (after nine applications of HSAM) (c).



SUMMARY OF RESULTS

- Most patients in the study were male (68%) with the mean age of the entire cohort being 66.7 years.
- Eighty-eight percent of DFUs were present for <6 months at first presentation (Table 1).
- The cohort had a mean wound area of 3.5 cm^2 and had a mean percent area reduction of -68.3 % from first presentation to baseline.
- The mean number of HSAM applications was 5.5 and the mean interval of time between each application was 7.5 days.
- Mean percentage area reduction from baseline was: 40.9% at week 4; 78.1% at week 8; and 60.5% at week 12.
- At week 4, 13 (26%) DFUs attained complete wound closure (CWC) which doubled to 26 (52%) by week 8 and rose to 39 (78%) by week 12 (Figure 1).
- The median time to CWC was 55 days (95% confidence interval: 36.0–63.0).

Figure 1. Frequency of Complete Wound Closure



CONCLUSIONS

- The results of this real-world retrospective case series substantiates the results of the randomized controlled trial in DFUs[5], further demonstrating reliability of the data.
- The findings of this retrospective case series suggest positive outcomes for DFUs managed with HSAM.
- A reduction in time to CWC may lead to lesser financial burden and improved quality of life for DFU patients.

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ORGANOGENESIS

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