

Management of Lower Extremity Wounds With Mechanically Powered Disposable Negative Pressure Therapy: Navigating Reinjury and Therapy Interruptions

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Introduction

- Lower extremity wounds in patients with multiple comorbidities or complex medical histories are important to manage adequately to prevent secondary complications such as infection or stalled healing.
- For small, complex wounds that persist even after standard care, the use of a mechanically powered disposable negative pressure wound therapy (dNPWT)* device can be an effective option.¹

Purpose

- We present 4 complex cases of lower extremity wounds managed with dNPWT.

Methods

- Debridement and antibiotics were utilized as necessary.
- dNPWT* was applied at -125 mmHg and dressings were changed 3 times per week.
- After dNPWT, wound closure was assisted by applications of an antimicrobial wound matrix[§], alginate dressing with silver[†], or autologous skin grafting.

Results

- The patients’ demographics, comorbidities, and wound type are shown in **Table 1**.
- Two patients received antibiotic therapy for diagnosis of osteomyelitis.
- dNPWT was applied for 3-4 weeks, although 3 patients experienced therapy interruptions due to femur fracture, ankle fusion revision, or hyperbaric oxygen therapy.
- During these interruptions, 2 patients acquired additional wounds. One patient with a nearly healed wound suffered a minor contusion injury, resulting in wound regression.
- Despite these setbacks, wound sizes decreased during dNPWT and all wounds were ultimately closed within the 10- to 58-week observation period (**Figures 1-3**).

Figures

Case 1. An 85-year-old male presenting with an open wound after excision of a hematoma.



Figure 1A. Initial presentation.



Figure 1B. Significant reduction of wound size after application of dNPWT.



Figure 1C. Wound appearance upon discharge to assisted living facility.

Case 2. A 59-year-old male presenting with an open wound after ankle fusion surgery.



Figure 2A. Initial presentation.



Figure 2B. Wound appearance after 7 weeks of therapy.



Figure 2C. Wound appearance after 11 weeks of therapy.

Case 3. A 73-year-old male with Charcot foot deformity presenting with a diabetic foot ulcer.



Figure 3A. Initial presentation.



Figure 3B. Wound appearance after 2 weeks of dNPWT.



Figure 3C. Wound appearance after dNPWT and 1 month of hyperbaric oxygen therapy.

Results (Cont’d)

Table 1. Patient and wound characteristics with closure type

Case	Age	Sex	Comorbidities	Wound Type	Closure Type
1	85	M	Peripheral artery disease, smoker	L leg hematoma excision	Wound matrix, alginate dressing
2	59	M	Coronary artery disease, HTN	R ankle surgical incision	Epidermal micrografts
3	73	M	HTN, diabetes, peripheral neuropathy	R foot DFU	Wound matrix
4	66	F	None	R leg deep abrasion	Secondary intention

DFU = diabetic foot ulcer, HTN = hypertension

Conclusions

- These cases represent difficult-to-treat scenarios in which dNPWT contributed to a positive healing outcome.
- Despite significant interruptions and wound regression unrelated to dNPWT, closure was achieved in all cases.

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References: 1. Nussbaum SR, Carter MJ, Fife CE, et al. Comparative effectiveness of the SNaP wound care system. *Value in Health*. 2018;21(1):27-32.