

Mechanically Powered Disposable Negative Pressure Wound Therapy Use in Three Patients

Emily Greenstein, APRN, CNP, CWON-AP, FACCWS; Comprehensive Wound Care, Sanford Health, Fargo, ND

Background

- Electrically powered negative pressure wound therapy (NPWT) is commonly utilized in complex wounds.
- However, this therapy requires electrical power, is noisy, and can interfere with patient ambulation.
- Another option available is mechanically powered, disposable NPWT (dNPWT*).
- dNPWT can be utilized in patients with small to medium sized wounds, does not require electrical power, is quiet, and is lightweight.^{1,2}
- In patients with small to medium sized wounds requiring NPWT, dNPWT may provide clinicians another therapy option.

Purpose

- Use of dNPWT in 3 patients was examined.

Methods

- Antibiotics were given as needed.
- dNPWT was applied with dressing changes every 2-3 days.
- Advanced wound dressing use was initiated in 2 patients after dNPWT was discontinued.

Results

- Three patients (age range: 52-78 years) presented for care (Table 1).
- Wound types included dehiscence (n=2) and pressure injury (n=1).
- Patient medical history included: hypertension, diabetes, peripheral vascular disease, and previous amputation.

Cases

Case 1. A 52-year-old male presented with wound dehiscence following inguinal hernia repair. dNPWT was initiated with dressing changes twice a week for 21 days. At day 21, dNPWT was discontinued for advance wound dressings.



Figure 1A. Wound at presentation (Day 0, 0.5 x 6.0 x 4.0 cm³)



Figure 1B. Wound after 4 days of dNPWT (Day 4, 0.5 x 6.0 x 4.0 cm³)



Figure 1C. Wound after 14 days of dNPWT (Day 14, 0.5 x 4.0 x 1.0 cm³)



Figure 1D. Wound after 21 days of dNPWT (Day 21, 0.3 x 3.0 x 0.1 cm³)

Case 2. A 78-year-old male presented with a 3-month-old stage 3 pressure injury caused by a limb prosthesis. dNPWT was initiated with dressing changes twice a week for 28 days. At day 28, dNPWT was discontinued for advance wound dressings.



Figure 2A. Wound at presentation (Day 0, 1.0 x 0.5 x 0.1 cm³)



Figure 2B. Wound after 7 days of dNPWT (Day 7, 1.0 x 0.5 x 0.1 cm³)



Figure 2C. Wound after 14 days of dNPWT (Day 14, 0.8 x 0.5 x 0.1 cm³)



Figure 2D. Wound after 28 days of dNPWT (Day 28, 0.8 x 0.4 x 0.1 cm³)

Case 3. A 78-year-old male presented with a wound dehiscence following a first ray resection. dNPWT was initiated with dressing changes twice a week for 21 days.



Figure 3A. Wound at presentation (Day 0, 1.0 x 5.0 x 3.0 cm³)



Figure 3B. Application of dNPWT



Figure 3C. Wound after 7 days of dNPWT (Day 7, 1.0 x 5.0 x 1.0 cm³)



Figure 3D. Wound after 14 days of dNPWT (Day 14, 1.0 x 4.0 x 1.0 cm³)



Figure 3E. Wound after 21 days of dNPWT (Day 21, 1.0 x 3.0 x 0.5 cm³)

Results (Cont'd)

Table 1. Patient demographics

Case	Age	Sex	Medical History	Wound Type
1	52	Male	Hypertension; Inguinal Hernia	Dehiscence
2	78	Male	Hypertension; Diabetes; Peripheral Vascular Disease; Previous BKA	Stage 3 Pressure Injury
3	78	Male	Diabetes; CAD; PVD; Atrial Fibrillation; Previous 1st Ray Resection	Dehiscence

BKA=Below-the-knee amputation; CAD=Coronary artery disease; PVD=Peripheral vascular disease

- Wound area and volume reduction was observed in all 3 patients (Figures 1-3).
- After 21-28 days, dNPWT was discontinued.
- Complete wound healing was observed in 2 patients.
- Unfortunately, the remaining patient passed away before wound healing was observed; this was unrelated to the patient's wound care.

Conclusions

- The use of dNPWT in these 3 patients contributed to complete wound healing in 2/3 patients, and wound area and volume reduction in the remaining patient.

References

- Tettelbach W, Arnold J, Aviles A, et al. *Wounds*. 2019;31(2 Suppl):S1-S17.
- Lerman B, Oldenbrook L, Ryu J, et al. *J Diabetes Sci Technol*. 2010;4(4):825-830.