

Negative Pressure Wound Therapy With Instillation and a Hybrid Drape Use in a Small Case Series

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

Background

- Negative pressure wound therapy with instillation and dwell (NPWTi-d*) is traditionally applied using foam dressings and an acrylic adhesive drape.
- However, this type of drape is not able to be repositioned following initial placement and can be painful to remove at dressing changes.^{1,2}
- A hybrid polyurethane drape with acrylic adhesive and a silicone perforated layer (hybrid drape[®]) has been developed for use.

Purpose

- This 5-patient case series describes the initial use of NPWTi-d with reticulated open cell foam with through holes (ROCF-CC[†]) and hybrid drape.

Methods

- Sharp debridement was performed, and intravenous antibiotics were given, as necessary.
- Delicate structures were protected with non-adherent dressings followed by application of ROCF-CC dressings and the hybrid drape.
- Acetic acid (0.25%) or normal saline was instilled into the wound bed with a dwell time of 5-10 minutes, followed by 3-3.5 hours of negative pressure (-100 mmHg to -125 mmHg).
- NPWTi-d dressings were changed every 2-3 days.
- In one patient, traditional NPWT[‡] was utilized after NPWTi-d was discontinued. NPWT dressing changes occurred every 2-3 days.
- Wound closure was achieved via split-thickness skin grafts (STSGs) or allowed to heal by secondary intention.

Results

- Five patients (age range 29-66 years) presented for care with surgical wounds, wound dehiscence, pressure injuries, or Fournier's gangrene (Table 1).
- Previous medical history included gastric bypass, hypertension, alcoholism, diabetes, tobacco use, and paraplegia.

Representative Cases

Case 1. A 61-year-old female presented with a stage 3 pressure injury of the thigh. Surgical debridement was performed followed by application of NPWTi-d (normal saline, 10-minute dwell time, 3 hours of negative pressure at -125 mmHg). After 7 days, NPWTi-d was discontinued for traditional NPWT with hybrid drape. After 9 days, the patient received a STSG. Complete re-epithelialization occurred 49 days after presentation.



Figure 1A. Wound 1 week after surgical debridement (Day 0, 7.2 × 11.9 × 4.0 cm³)
Figure 1B. Wound after 7 days of NPWTi-d (Day 7, 7.0 × 11.0 × 3.5 cm³)
Figure 1C. Wound after 7 days of NPWT (Day 14, 6.0 × 9.0 × 1.5 cm³)
Figure 1D. Complete re-epithelialization of wound (Day 49)

Case 2. A 66-year-old male, with a history of paraplegia, presented with a stage 3 pressure injury of the left hip. Surgical debridement was performed followed by application of NPWTi-d (normal saline, 10-minute dwell time, 3.5 hours of negative pressure at -125 mmHg). After 10 days, NPWTi-d was discontinued for standard of care dressings. The wound was healed by secondary intention 6 months after surgical debridement.



Figure 2A. Wound after surgical debridement (Day 0, 7.0 × 9.0 × 2.0 cm³)
Figure 2B. Application of NPWTi-d (Day 0)
Figure 2C. Wound after 7 days of NPWTi-d (Day 7, 7.0 × 9.0 × 1.5 cm³)
Figure 2D. Wound fully healed 6 months after presentation

Case 3. A 51-year-old female presented with Fournier's gangrene of the right buttock and hip. Surgical debridement was performed followed by application of NPWTi-d (0.25% acetic acid, 10-minute dwell time, 3 hours of negative pressure at -125 mmHg). After 28 days, NPWTi-d was discontinued and the patient was discharged to a skilled nursing facility. The patient received a STSG 83 days after surgical debridement.



Figure 3A. Wound after surgical debridement (Day 0, 20.0 × 27.0 × 3.5 cm³, hip shown on right)
Figure 3B. Wound after 7 days of NPWTi-d (Day 7, 20.0 × 27.0 × 3.5 cm³ and medial margin pocket of 6 cm, hip shown on right)



Figure 3C. Wound after 14 days of NPWTi-d (Day 14, 19.0 × 26.0 × 2.5 cm³ with a medial margin pocket 10.0 × 9.0 cm², hip shown on right)
Figure 3D. Wound after 21 days of NPWTi-d (Day 21, 19.5 × 24.0 × 2.0 cm³ with a medial margin pocket 7.0 × 9.0 cm², hip shown on right)



Figure 3E. Wound after 28 days of NPWTi-d (Day 28, 13.0 × 22.0 × 2.0 cm³ with a medial margin pocket 7.5 cm)
Figure 3F. Wound 1 week after STSG placement (Day 90)

Results (Cont'd)

Table 1. Patient demographics

Case	Age	Sex	Wound Type
1	61	Female	Pressure Injury
2	66	Male	Pressure Injury
3	51	Female	Fournier's Gangrene
4	65	Male	Surgical Wound Post Exploratory Laparotomy
5	29	Male	Transmetatarsal Amputation Wound Dehiscence

- The hybrid drape was able to be repositioned following initial placement.
- No negative pressure or instillation solution leaks were observed with hybrid drape use.
- Hybrid drape removal was easy with no patient-reported pain at dressing changes.
- Development of healthy granulation tissue was observed in the wound beds of all 5 patients.
- Representative cases are shown in Figures 1-3.

Conclusions

- In these 5 patients, use of NPWTi-d with hybrid drape resulted in granulation tissue development within the wound bed without the loss of negative pressure seal, instillation solution leakage, or periwound skin irritation.

References

- Fernández LG, Matthews MR, Benton C, et al. *Int Wound J.* 2020;17(6):1829-1834.
- Greenstein E, Moore N. *Wounds.* 2021;33(11):304-307.