

# Negative Pressure Wound Therapy with Instillation and Dwell Utilizing a Novel Hybrid Silicone Acrylic Drape: A Case Series

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## Introduction

- Negative pressure wound therapy (NPWT) with instillation and dwell time (NPWTi-d)\* combines the beneficial effects of negative pressure with the automated flow of topical solutions, solubilization of debris covering the wound bed, and removal of wound fluid.
- This method requires the use of a clear drape, traditionally composed of acrylic, over the foam dressings to create a vacuum seal. However, this acrylic drape can create a strong adhesive bond that can be difficult to remove or reposition.
- Recently, we have begun using a novel low tack silicone-acrylic drape† in the place of the standard drape with NPWTi-d.

## Purpose

- The aim of this case series is to describe the use of this hybrid drape on patients with lower extremity wounds in combination with NPWTi-d.

## Methods

- Deidentified data was collected after obtaining informed patient consent and stored in accordance with federal regulations.
- Patients underwent surgical debridement or amputation intervention if indicated for various foot, ankle, or lower leg wound pathologies.
- NPWTi-d was initiated with normal saline and a dwell time of 20 minutes, followed by 3.5 hours of negative pressure. NPWTi-d dressings were changed every 2-3 days.
- After NPWTi-d was discontinued, patients were transitioned to traditional NPWT‡ and, if clinically appropriate, advanced dressing regimens.

## Results

- The patients were 4 females, aged 41 to 60 years old.

## Cases

**Figure 1.** A 60-year-old diabetic female with a rearfoot varus deformity presented for wet gangrene involving the left 5<sup>th</sup> toe. She underwent a partial left 5<sup>th</sup> ray resection, but complete closure was not immediately possible due to soft tissue loss.



**Fig 1A.** Initial presentation of gangrenous left 5<sup>th</sup> toe.

**Fig 1B.** After debridement, placement of NPWTi-d dressing with through-holes<sup>§</sup> and hybrid drape.

**Fig 1C.** Wound appearance after 6 days of NPWTi-d with normal saline.

**Fig 1D.** Wound after debridement and 2 months of conventional NPWT.

**Figure 2.** A 58-year-old female with peripheral artery disease and coronary artery disease presented with dry gangrene of the left great toe. She underwent left foot 1st ray resection with extensive forefoot debridement, but complete closure was not immediately possible due to soft tissue loss.



**Fig 2A.** Initial presentation of gangrenous left great toe.

**Fig 2B.** After debridement, placement of NPWTi-d dressing with through-holes.

**Fig 2C.** Placement of the hybrid drape and application of NPWTi-d.

**Fig 2D.** Wound appearance after 6 days of NPWTi-d with normal saline.

**Figure 3.** A 58-year-old female with a history of smoking presented with bilateral lower leg contusion injuries with deep tissue involvement. She underwent debridement of both legs, with NPWTi-d applied only to the left leg wound.



**Fig 3A.** Initial presentation of contusion injury on left leg.

**Fig 3B.** After debridement, placement of NPWTi-d dressing with through-holes.

**Fig 3C.** Wound appearance after 3 days of NPWTi-d with normal saline.

**Fig 3D.** Appearance after transition to 2.5 weeks of conventional NPWT.

**Figure 4.** A 41-year-old female with poorly controlled diabetes presented with a chronic right heel wound present for several weeks. Upon hospitalization, she was found to have osteomyelitis involving the posterior, plantar portion of the right calcaneus. Surgical debridement and parenteral antibiotics were initiated prior to NPWTi-d.



**Fig 4A.** Initial presentation of right heel chronic wound. Note presence of parenteral antibiotics.

**Fig 4B.** Appearance after 3 days of NPWTi-d and 2 weeks of conventional NPWT.

**Fig 4C.** Wound appearance after 1 month of conventional NPWT.

**Fig 4D.** Closed wound upon follow-up at just under 3 months.

## Results (Cont'd)

- Case photos are shown in **Figures 1-4**.
- Wound etiologies are described in **Table 1**.
- All patients in this case series demonstrated positive wound healing outcomes with no significant complications related to the novel silicone-acrylic drape used in connection with NPWTi-d.

**Table 1.** Patient and wound characteristics with duration of NPWTi-d.

Age	Sex	Comorbidities	Wound Type	NPWTi-d Duration
60	F	Diabetes, rearfoot varus deformity	L 5 <sup>th</sup> toe gangrene	6 days
58	F	PAD, CAD	L great toe gangrene	6 days
58	F	Smoking	L leg contusion injury	3 days
41	F	Diabetes	R foot chronic osteomyelitis	3 days

CAD = coronary artery disease, NPWTi-d = negative pressure wound therapy with instillation and dwell time, PAD = peripheral artery disease

## Conclusions

- In these patients, the silicone-acrylic drape adequately created a seal while allowing for easy repositioning after initial placement around anatomically difficult areas.
- The gentle adhesion of the drape also improved patient comfort at dressing changes and during wear time.