Efficiency of New Smart Instillation Technology with Negative Pressure Wound Therapy in Managing Complex Chronic and Surgical Wounds: Case Series

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Aim

- We report our initial experience with a new smart technology integrated into a negative pressure wound therapy (NPWT) device with topical solution instillation[1] in managing complex wounds containing large areas of devitalized tissue and/or yellow fibrinous slough.

Methods

- NPWT with instillation and dwelling (NPWTi-d*) of saline was applied via a reticulated open-cell foam dressing with through holes (ROCF-CC†)[2] in four large complex wounds.
- Antibiotics were administered as appropriate.
- Surgical debridement was performed prior to NPWTi-d initiation and at dressing changes as needed in one wound; the other three wounds were not surgically debrided.
- The smart instillation software was employed to automatically determine solution volume according to wound size.
- Default settings were used to instill saline into the wound bed with a 10-mintue dwell time, followed by 2 hours of negative pressure.
- Dressings were changed three times per week.
- Therapy was switched to conventional NPWT when wound bed was covered with clean granulation tissue.

Results

- Smart technology automated several therapy initiation steps that were previously more time-consuming and complicated.
- The automation reduced guesswork and led to faster and easier NPWTi-d setup.

Cases

Case 1. A 62-year-old male presented with a pressure injury on his right posterior thigh. The wound was debrided, and NPWTi-d was initiated. After 39 days of NPWTi-d, the wound was clean and considerably smaller. Therapy was switched to NPWT and the patient was discharged to community care.

Figure 1A. Pressure injury with presence of devitalized muscle after conservative sharp debridement

Figure 1B. NPWTi-d applied with ROCF-CC dressing, bridged to the lateral thigh for offloading

Figure 1C. After 6 days of NPWTi-d, devitalized tissue was softened and easier to debride

Figure 1D. After 14 days, the wound bed was mostly clean and granulating

Figure 1E. After 27 days, the wound bed was well granulated; therapy was switched to NPWT on day 39

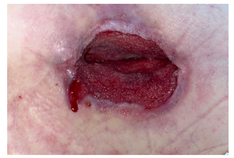

Figure 1F. NPWT was discontinued after 30 days, and an antibacterial foam dressing was used until surgical flap closure

Case 2. A 23-year-old male presented with a deep infected soft tissue wound from an injection site. Antibiotics were initiated. NPWTi-d was utilized for 22 days, until the wound was covered with healthy granulation tissue. Therapy was switched to traditional NPWT for one week, then a split-thickness skin graft was applied. NPWT was used as a bolster over the skin graft, and graft take was 100%.

Figure 2A. At presentation

Figure 2B. Foam dressing removal after 4 days of NPWTi-d (second dressing change)

Figure 2C. After 8 days of NPWTi-d

Figure 2D. After 15 days of NPWTi-d, wound depth was filled in

Case 3. A 73-year-old female presented with a hematoma on her right shin after a fall. The eschar was lifted off and the wound bed was irrigated. NPWTi-d was utilized for 10 days. The patient was discharged to community care.

Figure 3A. Wound covered with eschar at presentation

Figure 3B. Lifting off eschar prior to initiating NPWTi-d

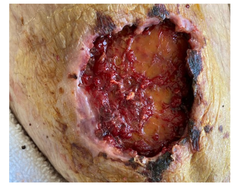

Figure 3C. After eschar removal and irrigation, NPWTi-d initiated

Figure 3D. After 2 days of NPWTi-d

Figure 3E. After 6 days of NPWTi-d

Figure 3F. After 10 days of NPWTi-d

Case 4. A 90-year-old female presented with midline dehiscence from a bowel resection and ileostomy. Antibiotics were initiated. NPWTi-d was utilized for 10 days, then switched to traditional NPWT. The patient passed away due to causes unrelated to wound care.

Figure 4A. Wound covered with devitalized tissue at presentation

Figure 4B. NPWTi-d dressing application

Figure 4C. After 10 days of NPWTi-d and 4 days of NPWT

Results (Cont'd)

- No saline leaks occurred during therapy.
- The duration of NPWTi-d ranged from 10 to 39 days.
- All wounds previously covered with devitalized tissue were converted to clean granulating wounds during therapy (Figures 1-4).

Discussion

- In this case series, new smart technology simplified usability by automatically estimating and distributing the appropriate level of instilled solution volume and adjusting the volume as the wound size decreased.
- The smart instillation feature was easy to use and distributed adequate volumes of topical solution to facilitate regular cleansing and hydromechanical removal of devitalized tissue through the ROCF-CC dressing.

References

1. Kim PJ, Attinger CE, Constantine T, et al. Negative pressure wound therapy with instillation: International consensus guidelines update. *Int Wound J*. 2020;17(1):174-186.
2. Tèot L, Boissiere F, Fluieraru S. Novel foam dressing using negative pressure wound therapy with instillation to remove thick exudate. *Int Wound J*. 2017;14(5):842-848.

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*3M™ Veraflo™ Therapy, †3M™ V.A.C. Veraflo Cleanse Choice™ Dressing (Solventum Corporation, Maplewood, MN)

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