Hydromechanical removal of non-viable tissue using negative pressure wound therapy with instillation and dwell plus foam dressing with through-holes in sacral wound management

Elizabeth Faust, MSN, CRNP, CSWS, CWOCN-AP
Lizzie Wounds, LLC., Douglassville, PA

Background

- Non-viable tissue (NVT) removal is essential to promote wound healing.
- While surgical debridement is the gold standard, it may not always be feasible due to patient factors, operating room availability, or the need to be performed serially.
- Recently, a new indication was granted for negative pressure wound therapy with instillation and dwell (NPWTi-d) using reticulated open cell foam dressing with through-holes (ROCF-CCC) for hydromechanical removal of infectious material and wound debris.
- Three cases are presented highlighting NPWTi-d* with ROCF-CCC† dressing use for wound cleansing and hydromechanical removal of NVT within sacral wounds.

Methods

- A retrospective chart review was performed for 3 patients with sacral wounds treated using NPWTi-d.
- ROCF-CCC dressing was applied to the wound bed and covered with hybrid adhesive drape.‡
- An automated system§ on the therapy unit provided therapy parameters for topical wound solution (12-24 mL hypochlorous acid solution) instillation.
- In each patient, the topical wound solution dwell-time was 10 minutes followed by 2 hours of subatmospheric pressure (-125 mmHg).
- Dressings changes were every 48-72 hours.

Results

- Three patients (aged 47-72 years) presented with sacral wounds (**Figures 1-3**).
- Antibiotics and anti-fungals were administered as needed.
- Prior to NPWTi-d, wounds were 35-60% covered with NVT..
- Wound etiology included pressure injuries (PI) (n=2) and a non-healing surgical wound (n=1).
- Patient 1 (53-year-old male) had a pressure injury with 50% NVT, who was previously treated using a collagenase ointment. After 13 days with NPWTi-d with ROCF-CCC, NVT was reduced to 30%.
- Patient 2 (47-year-old male) had a sacral surgical wound with 35% NVT status post skin excision resultant of recurrent abscess formation. After 9 days of NPWTi-d use with ROCF-CCC, NVT was reduced to 5%.
- Patient 3 (72-year-old female) had a PI with exposed bone and 60% NVT. After 4 days of NPWTi-d with ROCF-CCC, NVT was reduced to 30%.

Cases

Case 1: A 53-year-old male was readmitted due to septic shock and esophageal perforation 2 days after discharge status post laparoscopy, pyloromyotomy, jejunostomy tube placement, bronchoscopy and transthoracic esophagectomy. Perforation was managed via endoluminal vacuum therapy and nasogastric tube placement. A deep tissue injury (10 cm x 12 cm x 0.2 cm) was noted on the sacrum (Day 4) and became necrotic (Day 11). Wound was initially treated with collagenase ointment and an absorbent silicone foam dressing. Following bedside debridement, NPWTi-d with ROCF-CCC dressing was initiated. NPWTi-d instilled hypochlorous acid solution (22 mL). After 4 ROCF-CCC dressing changes, NPWTi-d was discontinued. Patient transitioned to NPWT. Patient transferred to a long-term assisted care facility on Day 62.

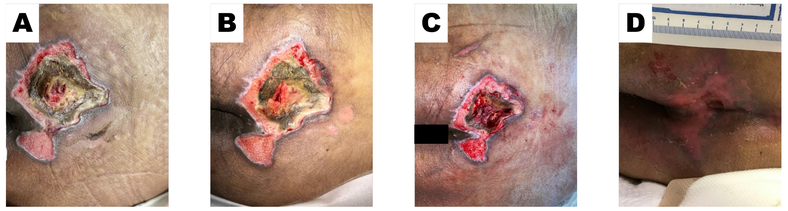

Figure 1. Hydromechanical removal of necrotic tissue from hospital-acquired PI to sacral region using NPWTi-d with ROCF-CCC dressing. **A.** Wound with 50% necrotic tissue after bedside debridement (Day 36). **B.** Wound after third ROCF-CCC dressing change. **C.** Wound with 5% necrotic tissue after bedside debridement (Day 49). **D.** Wound nearly closed at evaluation during non-wound related readmission (Day 203).

Case 2: A 47-year-old male presented with recurrent drainage from a perineal wound. Patient has a prior medical history of rectal cancer status post proctocolectomy with end ileostomy and left rectus abdominis myocutaneous rotational flap. Perineal abscess was drained followed by a dressing change after 3 days. Patient underwent further excisional debridement. The acute wound was occupied with 35% non-viable tissue and NPWTi-d with ROCF-CCC was placed within the operating room. NPWTi-d instilled hypochlorous acid solution (12 mL). NPWTi-d was discontinued after the second dressing change. Xenograft was placed and NPWT was applied to bolster the graft.

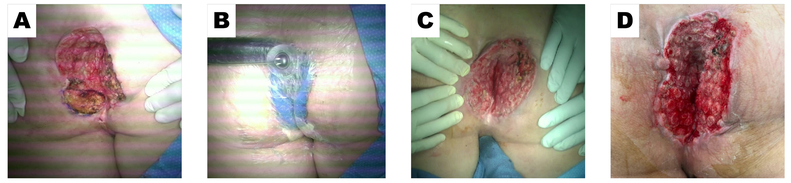

Figure 2. Sacral surgical wound with 35% NVT. **A.** Wound after surgical debridement. **B.** NPWTi-d with ROCF-CCC applied to sacral wound. **C.** Wound after ROCF-CCC dressing change. **D.** Wound (5% non-viable tissue) after ROCF-CCC dressing change before xenograft placement.

Cases (Cont'd)

Case 3: A 72-year-old female presented to the emergency department with multiple wounds. Patient has a history of neuropsychiatric disorders. The patient was previously treated with a NPWT system that employed a green foam dressing. Patient underwent excisional debridement of sacral wound for bone fragments, slough, and the green foam dressing. The wound (6.3 cm x 10 cm x 2.3 cm) had areas of undermining. Barrier ring was applied at inferior margin of wound and NPWTi-d with ROCF-CCC was applied within the operating room. NPWTi-d instilled 24 mL of hypochlorous acid solution. NPWTi-d was discontinued after the second dressing change. Patient was placed on low air loss mattress with repositioning.

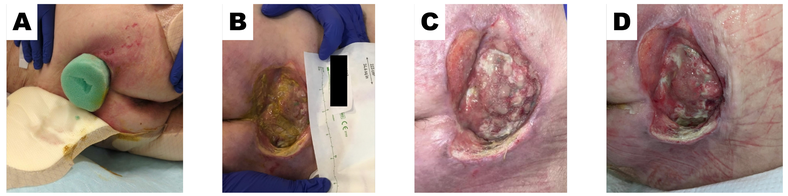

Figure 3. Pressure injury with 60% NVT and exposed bone. **A.** Wound at presentation. **B.** Wound at Day 2 after excisional debridement of sacral wound for bone fragments and slough. **C.** Wound at Day 4 after ROCF-CCC dressing change demonstrating hydromechanical removal of non-viable tissue and slough. **D.** Wound at Day 6 before transition to NPWT demonstrating further hydromechanical removal.

Conclusions

- In these patients with sacral wounds, hydromechanical removal of NVT using NPWTi-d with ROCF-CCC dressing demonstrated favorable clinical outcomes for wounds with ≥20% NVT in the acute care setting.
- This novel indication demonstrates the usefuleness of NPWTi-d in wound management[1-3] when surgical debridement is either delayed or not indicated for the patient.

References

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*3M™ Veraflo™ Therapy, †3M™ Veraflo™ Cleanse Choice Complete™ Dressing Kit, ‡3M™ Dermatac™ Drape, §3M™ Smart Instill™ (Solventum Corporation, Maplewood, MN)

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