The Evaluation of a Combined Negative Pressure Wound Therapy and Negative Pressure Wound Therapy With Instillation System for the Treatment of Difficult to Heal Wounds: An Initial Clinical Experience

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Background

- Negative pressure wound therapy (NPWT) is increasingly used in combination with instillation therapy (NPWTi) to treat wounds that would benefit from the instillation of topical wound fluids, such as contaminated or stalled wounds, wounds with exposed hardware or a foreign body, wounds with high levels of exudate and slough content, painful wounds, and wounds at high risk for amputation.[1-4]
- Controlled fluid instillation in tandem with NPWT may help promote wound healing by enhancing exudate and infectious material removal.[3-5]

Purpose

- To evaluate a new combination NPWT/NPWTi* system for the treatment of difficult-to-heal wounds.

Methods

- After wounds were acutely debrided, NPWT or NPWTi was used for all patients.
  - NPWT was applied to one patient's wound, segmented into halves, with reticulated open cell foam (ROCF†) and a less hydrophobic ROCF (ROCF-VC†).
  - All other patients' wounds were treated with NPWTi/ROCF-VC or ROCF-V‡ with automated, volumetric-controlled administration of Microcyn®** (4 patients) or 1/4 strength Dakin's Solution®†† (1 patient).
- NPWT cycle time (3-4 hrs), soak time (5 or 10 min), and continuous pressure (-100 or -125 mmHg) were set.
- At set soak time intervals, the negative pressure cycled off. Fluid was instilled to fill the foam and was held in the foam and wound cavity for the set soak time, then removed when NPWT was resumed.
- Dressings were changed every 2-3 days, at which time wound progress was charted.
- Therapy was discontinued when the wound was ready for further surgical procedures, the patient was transferred from the acute care setting, or the wound progressed to a point that a less advanced wound treatment modality could be used.

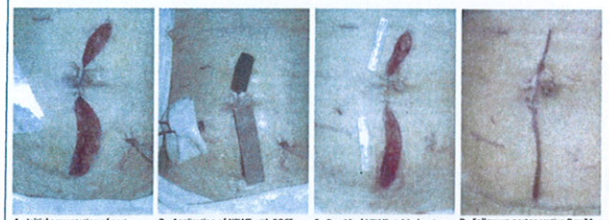
Results

Table 1: Patient Demographics

Patient #	Sex	Age (Years)	Wound Type	Therapy	Solution Instilled	Pressure Setting	Method of Closure
1	Male	60	Contaminated, complex chest wall wound	NPWTi/ROCF-V	Microcyn®	-125 mmHg	Secondary
2	Male	70	Hip wound	NPWTi/ROCF-VC and ROCF-V	Microcyn®	-125 mmHg	Secondary
3	Male	83	Open postoperative contaminated wound at a previous ileostomy site	NPWTi/ROCF-V	Microcyn®	-125 mmHg	Secondary
4	Male	32	Bowel perforation and several subsequent surgeries for abdomen wash out	NPWTi/ROCF-V	Microcyn®	-125 mmHg	Delayed Primary
5	Female	26	Open abdominal wound with exposed biological mesh	NPWTi/ROCF-V	Dakin's Solution®	-100 mmHg	Primary
6	Female	34	Open subcutaneous abdominal wound after peritonitis surgery	NPWTi/ROCF and ROCF-VC	NA	-125 mmHg	Secondary

Case Study 1

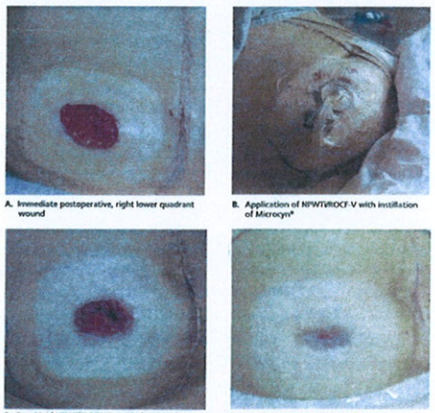
A 34-year-old female presented with an open subcutaneous abdominal wound after surgery for peritonitis.



A. Initial presentation of post-operative midline wound
B. Application of NPWT with ROCF (upper half) and ROCF-VC (lower half) dressings
C. Day 10 of NPWT at 4th dressing change
D. Follow up postoperative Day 24

Case Study 2

An 83-year-old male presented with an open postoperative contaminated wound at a previous ileostomy site.



A. Immediate postoperative, right lower quadrant wound
B. Application of NPWTi/ROCF-V with instillation of Microcyn®
C. Day 10 of NPWTi/ROCF-V at 4th dressing change
D. Follow up postoperative Day 34

Results (Cont'd)

- Six patients (Table 1) were treated with the new NPWT/NPWTi system.
- Average duration of NPWTi was 19 days.
- In the patient who received traditional NPWT without instillation using two different types of foam (Case Study 1):
  - NPWT duration was 10 days.
  - Granulation tissue in both halves of the wound showed no noticeable difference in degree or quality.
  - Both halves of the wound healed in a similar time period.
- All wounds were closed by primary, secondary or delayed primary intention.
- Investigator noted ease of use in set-up and wound management with this new NPWT/NPWTi system.
- Solution delivery appeared timely, and the dressing removed easily.
- No complications occurred during the study.

Conclusions

- The NPWT/NPWTi system operated safely within our pilot study.
- Less time was required for set-up and training with this NPWTi, compared with our experience with previous NPWTi.
- Within the limitations of this small study, this new NPWT/NPWTi system appears to be a viable modality in treating complex wounds that may benefit from automated, intermittent hydrocleansing.
- Additional studies are needed to determine the effects of various NPWTi parameters on wound healing.

References

1. Wolvos T. Wound instillation–The next step in negative pressure wound therapy. Lessons learned from initial experiences. Ostomy Wound Manage 2004;50(11):56-66.
2. Bernstein BH, Tam H. Combination of subatmospheric pressure dressing and gravity feed antibiotic instillation in the treatment of post-surgical diabetic foot wounds: a case series. Wounds 2005;17:37–48.
3. Wolvos T. Wound instillation with negative pressure wound therapy. Ostomy Wound Manage 2005;51(2A Suppl):21S–26S.
4. Gabriel A, Shores J, Heinrich C, et al. Negative pressure wound therapy with instillation: a pilot study describing a new method for treating infected wounds. Int Wound J 2008 Jun;5(3):399-413.
5. Gabriel A, Shores J, Bernstein B, et al. A clinical review of infected wound treatment with Vacuum Assisted Closure® (V.A.C.®) Therapy: Experience and case series. Int Wound J 2009;6(Suppl. 2):1-25.

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*V.A.C.ULTA™ Therapy, †V.A.C.† GranuFoam™ Dressing, †V.A.C. VeraFlo Cleanse™ Dressing, and †V.A.C. VeraFlo™ Dressing (KCI USA, Inc., San Antonio, TX)
**Microcyn® (Oculus Innovative Sciences, Petaluma, CA)
††Dakin's Solution® (Century Pharmaceuticals, Inc., Indianapolis, IN)
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