

Combined Use of Negative Pressure Wound Therapy and Acoustic Pressure Wound Therapy* to Prepare Infected, Open Postsurgery Wounds for Secondary Surgical Closure

Specialty Hospital of Washington Capitol Hill, Washington, DC

Melania Howell-Taylor, RN, BSN, CWOON, DAPWCA; Macy G. Hall Jr., MD, FACS; William J. Brownlee III, MD; Mary Taylor, C-NP



Background

Primary closure of infected surgical sites is typically deferred in favor of specialized wound care to resolve infection before secondary surgical closure. Optimal therapy to prepare such wounds for a secondary closure procedure remains uncertain.

Combination of negative pressure wound therapy (NPWT) and acoustic pressure wound therapy (APWT) was shown to reduce wound volume 99-100% in 4-12 weeks in patients with large, infected wounds post surgery or surgical debridement.¹ Studies suggest that NPWT and APWT each may be helpful in treating infected wounds and intact surgical wounds, but neither has been studied for open surgical wounds.^{2,3}

Treatment

APWT was administered thrice weekly to open, infected surgical-incision sites in conjunction with NPWT with reticulated open-cell foam (ROCF) dressing. Prior to using APWT at this facility, the average NPWT/ROCF course prior to secondary surgical closure was 30 days. See case reports and outcomes at right.

Conclusions

This is the second anecdotal report of APWT-NPWT treatment to speed healing of infected post-surgery wounds. Larger prospective studies of this combination therapy are warranted.

Patient 1

75-year-old woman

Conditions: type 2 diabetes, anemia



May 13
A: 336 cm², V: 941 cm³



May 22
A: 375 cm², V: 938 cm³



July 3
Surgically closed June 6

Wound: Infected, open abdominal wound from incarcerated abdominal hernia repair. Multiple mixed flora infections and graft failures prior to most recent surgery (April 28, 2008), when acellular dermal matrix (ADM) was placed. A large abdominal wound remained. Undermining: 6 cm, ≈ 50% wound circumference

Treatment: NPWT/ROCF with APWT applied during dressing changes and bacitracin ointment along the suture line May 16 to June 6 (day of surgical closure).

Outcomes: Surgical closure in 21 days. The patient did not complain of pain prior to or during NPWT/ROCF dressing changes.

Patient 2

77-year-old man

Conditions: type 2 diabetes, peripheral artery disease, anemia, chronic renal insufficiency



May 14
A: 333 cm²



May 29
A: 366 cm²



June 20
Closed with skin graft May 30

Wound: Left below-the-knee amputation (April 30, 2008) for suppurative infection of left foot with abscess formation and devitalized musculature. Incision left open due to mixed flora infection. At admission, patient reported episodes of phantom sensations at operative site.

Treatment: Intravenous (IV) meropenem. NPWT/ROCF with APWT May 16 to May 30 (day of closure with split thickness skin graft).

Outcomes: Surgical closure in 14 days. After first 2 APWT treatments, patient reported decreased phantom sensations. From June 2-11, 4 APWT treatments were applied over the new skin graft. June 11: complete healing and 100% graft take with molding was evident.

Patient 3

76-year-old woman

Conditions: kidney stones



June 16
A: 255 cm²



July 9
A: 263.5 cm²



July 21
Surgically closed July 17

Wound: Wound dehiscence after laparotomy for strangulated abdominal hernia. Patient presented June 12, 2008 with fever, fluid draining from wound, and MRSA infection. CT scan showed gastric-containing fistula.

Treatment: IV fluids and drain at fistula site. IV levofloxacin and vancomycin, morphine. NPWT/ROCF with APWT from June 16 to July 17 (date of surgical closure).

Outcomes: Gastric fistula closed in 18 days allowing for surgical closure 14 days later.

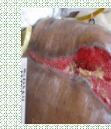
Patient 4

63-year-old woman

Conditions: mental retardation, type 2 diabetes, ventilator dependency



March 17
A: 260 cm²,
V: 1300 cm³



April 15
A: 111 cm²,
V: 167 cm³



April 25
A: 83 cm²,
V: 108 cm³

Wound: New-onset abdominal abscess incised and drained (with gastric tube replacement) February 28, 2008. Left open due to infection with *E. coli*, *Klebsiella*, *Pseudomonas*.

Treatment: IV meropenem, metronidazole, and vancomycin. Hydrogel March 11 (admission) to March 17. NPWT/ROCF with APWT from March 17 to April 25. Narcotic pain medication (hydromorphone 2 mg) required before initial dressing changes. Pain communicated by grimacing and withdrawing from staff.

Outcomes: After 4 APWT, need for narcotics decreased 50%. Slough in the wound bed (50% March 14 prior to NPWT/ROCF-APWT) decreased to 10% on April 11. During 5.6 weeks of treatment, wound area and volume decreased by 68% and 92%, respectively. Patient died of non-wound-related causes. Per visual assessment April 25, wound would likely heal without surgical closure.

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