Day 42

Day 34: The wound had decreased in depth and diameter, now measuring 3.4cm length x 3.1cm width x 1.7cm depth. Erythema had lessened and the wound bed tissue displayed granulation.

Day 42: When NPWT was discontinued the wound measurements were 0.6cm length x 0.4cm width x 0.02cm depth. The patient was transitioned to topical moist wound healing dressings.

Discussion

NPWT is an accepted and effective intervention for prompting healing of both chronic and acute wounds. This case study illustrates the additional benefits of this gauze-based system as a more comfortable approach to NPWT. In a comparative study, this patient had been treated with a foam-based NPWT system, experienced severe pain, and required intravenous narcotics. He was switched to the Talley VENTURI™ NPWT system and was able to be transitioned to over-the-counter pain relievers as he experienced minimal pain with the dressing changes with this system. This resulted in an improved quality of life for the patient, hastened recovery period with less use of heavy pain medications which impede rehabilitation, and a cost-effective wound care option for healthcare providers.

Conclusion

In conclusion, research supports that NPWT is an accepted intervention for appropriate wounds. It has been surmised that the use of NPWT can decrease infection rates up to 38%; decrease wound healing times up to 84%; and reduce costs of wound healing up to 68% (Journal of American Medicine).

References

Agreda, J. "The Burden of Pressure Ulcers in Spain", *Wounds*. 2007.

Cole, L., Nesbitt, C. "A Three Year Multiphase Pressure Ulcer Prevalence/Incidence Study in a Regional Referral Hospital", *Ostomy Wound Management*. HMP Communications, 2006.

Journal of American Medicine. www.jama.ama-assn.org, last accessed March 18, 2009.

Lemaster, J., Reiber, G. "Epidemiology and the Economical Impact of Ulcers", *The Foot in Diabetes*, 4th edition. Wiley and Sons, 2006.

Miller, M., Lowrey, C. "A Rose by Any Other Name", *Ostomy Wound Management*, March 2005.

Usbink, PT, et al. "Topical Negative Pressure for Healing Wounds", *Cochrane Database of Systematic Review Online*, last accessed March 17, 2009.

Wikipedia Online, www.wikepedia.com, last accessed March 17, 2009.

NURSE SHARKS
Positively Attacking Wounds

TALLEY MEDICAL

TALLEY GROUP LIMITED
Premier Way, Abbey Park Industrial Estate,
Romsey, Hampshire SO51 9DQ England
Tel: (0)1794 503500 Fax: (0)1794 503555 e-mail: sales@talleygroup.com
www.talleygroup.com

03/2009

Comfortable Negative Pressure Wound Therapy (NPWT) with the use of Talley Medical's VENTURI® system

Jen Agosti, RN, CWCA, FACCWS - President, Nurse Sharks, Inc
Randy A Agosti, MPT, FAPTA

Introduction

Pressure ulcers and wounds are a global healthcare issue, resulting in patient loss of life-quality, infections and hospitalisations, high healthcare costs to address healing, prolonged recovery times for post-operative patients and patient pain. Conservative cost estimates of caring for a patient with a pressure ulcer range from $5000 - $50,000 (approx £3,333 - £33,333). (Cole and Nesbitt, 2006).

The average hospital incurs $400,000 - $1,000,000 (approx. £266,000 - £666,666) annually in direct costs to treat pressure ulcers (Lemaster and Reiber, 2006). The use of NPWT for intervention with both acute and chronic wounds can decrease the healing time, infection rates, costs of treatment and improve patient comfort and quality of life (Agreda, 2007).

NPWT is the application of sub-atmospheric pressure in a controlled, closed environment to a wound (www.wikipedia.com, 2009). NPWT promotes wound healing by facilitation of removal of exudates from the wound bed, increasing blood flow and proliferation of growth factors to the wound bed and decreasing infection risk by maintaining a moist, closed wound environment (Usbink et al., 2009). NPWT has been in use, during the modern era of medicine, since the 1950's. Russian surgeons frequently utilised NPWT post-operatively to remove surgical wound fluids, thus decreasing infection rates and decreasing length of hospitalisation. The Kremlin Papers, written in a series of five case reports, were published in Russian medical journals between 1986-1991. The Kremlin Papers refer to NPWT application with the use of gauze and flexible silicone surgical drains for exudate removal with the dressing sealed in a closed environment and placed under a low continuous suction (Miller and Lowrey, 2005). Utilisation of the gauze dressing and low

suction approach remains true to the primary discovery and development of NPWT. The following case study demonstrates the gauze-based approach to NPWT, utilising the VENTURI™ system manufactured by Talley Medical.

Case Study

The study patient is a 51 year old male with an acute wound on his left ischial tuberosity. The patient suffered a fall from a ladder, during which time he incurred a large haematoma over the ischial area. The haematoma was drained twice before the surgeon commenced to perform a wide debridement of the area in order to properly heal the wound. Initially, the patient was placed on a foam-based NPWT system; however, the patient became dependent upon heavy doses of intravenous narcotics in order to tolerate the dressing changes. The patient would describe the dressing changes as severely painful with a sensation of tissue being torn from his wound with the use of a foam-based NPWT system. He was unable to attend rehabilitation due to the impact of the heavily sedating narcotics that he was requiring to manage the pain of the foam dressing changes. The patient had made no progress with mobility and his nutritional status was suffering related to his incoherence secondary to the narcotics. After 9 days

on a foam-based NPWT system, the surgeon ordered the Talley VENTURI™ NPWT system in an attempt to provide a less painful form of NPWT and wean the patient from the sedating narcotics which were impeding the patient's overall recovery from surgery. The surgeon's goal was to achieve adequate granulation tissue on the wound bed to prepare the wound for grafting.

The patient's past medical history included hyperlipedemia and non-insulin dependent diabetes mellitus. The patient was independent in all aspects of his life prior to his injury. His goal was to return home and get back to work at his job as a construction worker. The wound initially presented with 80% granulating base and 20% scattered yellow slough tissue. The wound was moderately sized, exudating approximately 120-150 cc of pink drainage daily, and the peri-wound tissue was fragile.

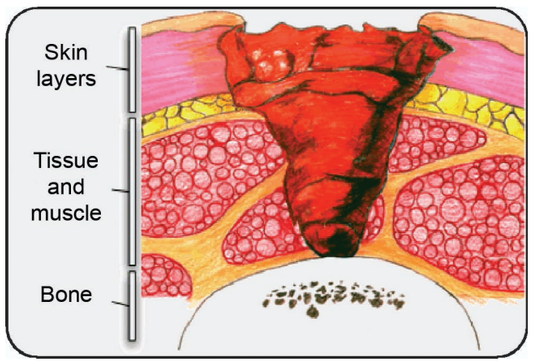

Illustration representing full thickness damage of the patient's wound

Pain Assessments

The patient was experiencing extreme pain of 10+ (1-10 scale), as self-reported, with use of a foam-based NPWT system. With transition to a gauze-based NPWT system, the patient had a significant decrease in dressing related pain.

Within a week of the switch, the patient was able to be weaned from intravenous narcotics to oral narcotics. Within two weeks, the patient was tolerating the dressing changes with over-the-counter pain relievers. Pain assessments progressively revealed decreasing reported pain. Mid-way through the use of the VENTURI™ system, the patient was reporting pain as 3 or 4 (1-10 scale) and the pain was managed with over the counter pain relievers. The last week before discontinuance of the VENTURI™ system, the patient reported his pain as 0 (1-10 scale) without any pain relievers being utilised.

Foam-based NPWT		
Day of Therapy	Self Reported Pain Rating	Medication Utilized for Pain
Day 9	10+	Intravenous narcotics around the clock with bolus dose prior to dressing change
VENTURI® NPWT		
Day of Therapy	Self Reported Pain Rating	Medication Utilized for Pain
Day 1	9	Intravenous narcotics as needed
Day 14	5	Oral narcotics as needed
Day 20	3 to 4	Oral over-the-counter pain relievers as needed
Days 36 to 42	0	No use of pain relievers

Method

The goal for implementation of NPWT was to achieve 100% granulation tissue to the wound bed and decrease the overall wound depth by 95%, in order to accomplish adequate granulation and finalise wound healing with topical moist wound dressings. To achieve the goal of expediting wound healing, the VENTURI™ system was initiated. The VENTURI™ system utilises saline-saturated antimicrobial gauze, and 10mm flat surgical drains, which are placed into the wound and sealed with a transparent occlusive dressing. Therapy was ordered at -85mmHg (continuous therapy) daily with dressing changes every 48 hours for the duration of therapy.

Specific treatment procedure occurred as follows:

- Wound was cleansed with normal saline and the peri-wound skin was patted dry
- Skin prep. was applied to the peri-wound tissue to facilitate adherence of the occlusive dressing
- A non-adherent, mesh contact layer was fitted to wound bed size and placed directly in the wound bed
- A flat 10mm suction drain was trimmed to 0.5cm less than the depth of the wound to allow for progressive healing from the inside of the wound
- Saline-moistened AMD gauze was placed over the contact layer in the wound bed in a fashion that mimics wound bed size
- The trimmed flat drain was then placed on top of the moistened gauze in the wound bed, a second layer of moistened, fluffed gauze was placed on top of the drain to fill the dead space of the wound
- A gel sheet was placed in proximity to the area where the drain would exit the wound for protection of the underlying skin and as a reinforcement to sealing the drain exit site
- The occlusive dressing was applied to the dressing, using a methodical side to side application, ending on the drain exit site side
- The drain tubing was secured distally with transparent medical tape to prevent dislodgement during repositioning and transfers
- The VENTURI™ was set to -85mmHg on continuous therapy and remained at that setting, with dressing changes every 48 hours throughout therapy
- Total time on NPWT: 42 days

Day 1

Day 34

Results

The VENTURI™ NPWT system was placed on the patient residing in a skilled nursing facility. After 42 days of therapy, the VENTURI™ system was discontinued with the goals of therapy being achieved, 100% granulation tissue in the wound bed and 95% decrease in wound depth. The patient reported no pain at the discontinuation of therapy. The original goal of therapy was to prepare the wound for surgical closure; however, the VENTURI™ was able to re-granulate the wound and decrease the depth so effectively, that the surgeon would be able to allow the wound close by primary intention, saving the patient a surgical procedure and saving the healthcare system resources with no surgical procedures required.

Day 1: At the initiation of NPWT, the wound measurements were as follows:- 5.6cm length x 5.3cm width x 3.5cm depth. The wound displayed erythema, moderate to large amounts of exudate and had persistent slough tissue around the inner periphery of the wound.