

Use of gauze-based NPWT for closure of an abdominal wound secondary to re-anastomosis of temporary colostomy

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Introduction

Negative Pressure Wound Therapy (NPWT), by definition, is the application of subatmospheric pressure in a closed drainage environment to a wound (Campbell et al. 2008). NPWT is delivered to the wound by a controlled electrical device or suction pump. The physiological benefits of NPWT include: removal of wound exudate; promotion of growth factors; maintenance of a moist wound environment; and management of tissue remodeling and contraction (Campbell et al. 2008).

NPWT, although recently gaining popularity, was developed in the 1950's in Russia by surgeons utilising a similar theory of wound drainage removal being more effective to control exudate and thereby, decrease post-operative infection rates (Chariker, Jeter et al. 1989). Utilisation of the gauze approach to NPWT application remains with the initial philosophy of NPWT as it was discovered and originally developed throughout the twentieth century.

The following case study demonstrates this type of approach to NPWT.

Case Study

The study patient is a 76 year female with a non-healing abdominal wound status post surgery. The patient has a history of abdominal surgery for ileus, hypertension and non-insulin dependent diabetes mellitus.

The patient had a temporary colostomy placed secondary to severe faecal impaction which caused damage to the bowel. The temporary colostomy was functional for 3 months, at which time the patient underwent a re-anastomosis of the colostomy. The surgical wound created during the reversal procedure was not healing with conventional topical wound treatments due to the presence of persistent drainage from the wound.

Initial Wound Treatment

The initial treatment for the abdominal wound was saline cleansing and hydrofibre packing twice daily. The patient reported pain of 7 (1-10 scale) with dressing changes with the hydrofibre packing.

The patient had experienced little improvement with this treatment and upon discharge from the acute setting to a long-term care facility the topical treatment had been discontinued.

It was at this time the physician implemented Negative Pressure Wound Therapy (NPWT) to treat this non-healing wound.

Aims and Objectives

The goal for implementation of NPWT was to achieve adequate granulation tissue to the wound bed and decrease the overall wound depth by 75%, in order to prepare the wound for transition to topical dressings.

To achieve these goals, NPWT incorporating saline-moistened gauze and a silicone drain was initiated.

Method

The NPWT system used utilises saline-moistened antimicrobial gauze and a silicone channel drain, which is placed into the wound and sealed with a transparent occlusive dressing.

Therapy was ordered continuous at -80mmHg 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 silicone channel 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 wrapped around the drain; this method was preferred by the clinicians performing the therapy application due to the wound location and small diameter
- The drain and AMD gauze were gently placed into the wound, using a sterile cotton tipped swab to facilitate placement to the appropriate depth of the wound

- Adhesive gel 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 paper tape to the patient's flank area to prevent slippage with repositioning and transfers
- The NPWT pump was set to -80mmHg on continuous therapy and remained at that setting, with dressing changes every 48 hours throughout the length of NPWT use

Results

The NPWT system was placed on the patient upon admission to the long-term nursing facility.

Day 1: At the initiation of NPWT, the wound measurements were as follows:- 2.5cm length x 1.0cm width x 3.0cm depth.

Day 10: The wound showed significant decrease in total surface, now measuring 1.0cm length x 0.5cm width x 1.7cm depth.

Day 39: After 39 days of therapy, the NPWT system was discontinued with the goals of therapy being achieved, 95% granulation tissue in the visible wound bed and >75% decrease in wound depth. The patient would experience a 99.73% decrease in total surface area. The patient reported the pain to be a 1 (1-10 pain scale) at the discontinuation of therapy.

The patient was then transitioned to a topical moist dressing, changed daily. A follow-up visit 16 days after NPWT was

discontinued revealed the stability of the fistula status post NPWT intervention for 39 days of treatment.

Discussion

NPWT is an accepted and effective intervention for prompting healing of chronic wounds. As demonstrated in this case study, the patient was unsuccessful to gain wound closure with traditional topical dressings and in an abbreviated time frame, was able to experience wound closure with the use of the NPWT system. A result that is both enlightening for the patient and cost-effective for the providers of care and payor sources for the patient.

Conclusion

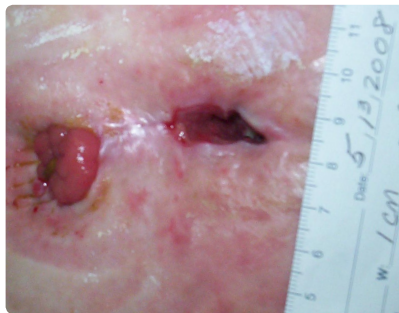
In conclusion, research supports that NPWT is an accepted intervention for appropriate wounds. It has been surmised that the use of NPWT can decrease infection rates up to 38%; decrease wound healing times up to 84%; and reduce costs of wound healing up to 68% (Journal of American Medicine, 2008).

References

Campbell, PE, Smith, GS, Smith JM. Retrospective Clinical Evaluation of Gauze-Based Negative Pressure Wound Therapy. *International Wound Journal*, 2008.

Chariker, M.E., Jeter, K.F., Tintle, T.E., Bottsford, J.E. (1989) Effective management of incisional and cutaneous fistulae with closed suction drainage. *Contemporary Surgery* Vol. 34, 59-63.

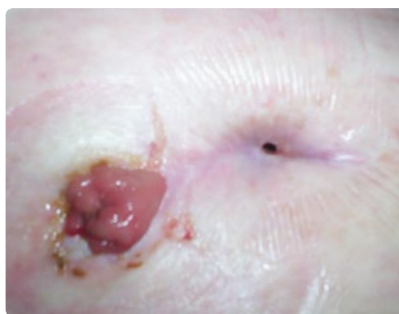
Journal of American Medicine, via internet, last accessed December, 17, 2008.



Day 1



Day 10



16 days after NPWT was discontinued

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