

# Effective use of a Negative Pressure Wound Therapy system for a complex patient within an acute care setting

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## Introduction and treatment aim

The psychological effect of wounds is well documented and with symptoms such as pain, exudate and odour they can have a huge impact on a patients' quality of life.<sup>1,2</sup> The use of negative pressure wound therapy (NPWT) has been shown to accelerate healing and assist with the effective management of symptom control<sup>3</sup> and with the annual cost of wound management in the NHS being estimated at £5.3 billion<sup>4</sup>, timely, cost effective intervention is essential.

The aim of this case study is to report the successful and life changing impact of a negative pressure wound therapy system when used to successfully manage the traumatic wounds of a complex patient.

## Patient history

A 52-year-old male with a medical history including type 2 diabetes, ischaemic heart disease and a blood clotting disorder (factor V Leiden thrombophilia) was admitted to hospital with abdominal and neck trauma following a road traffic accident. He weighed 128kg and had a BMI of 42.

The patient underwent neck surgery to repair vertebrae fractures to C7 and T1 and abdominal surgery for an ischaemic perforated bowel, with the formation of a mucous fistula and stoma. Post-surgical complications included dehiscence of the abdominal wound after 8 days, with the neck wound requiring a surgical washout after 5 days, this was then left open to heal by secondary intention. Both were found to be infected with *Pseudomonas*.

Initial wound management was performed daily using a Hydrofiber and adhesive foam wound dressing.

Prior to the use of any NPWT, the abdominal wound measured 21cm x 8cm x 7cm, resulting in a wound area of 168cm<sup>2</sup> and a wound volume of 1176cm<sup>3</sup>. The wound bed was 80% granulation, with 20% slough. Due to the local infection thick exudate was present and both odour and wound pain were reported.

The neck wound, measured 20cm x 7cm x 5cm which resulted in a wound area of 140cm<sup>2</sup> and a volume of 700cm<sup>3</sup>. The wound bed was 100% granulating, with low wound pain and exudate levels.

The patient was nursed in the Intensive care unit for 2 weeks before being transferred to a general surgical ward. He was NG fed for 3 weeks with nutritional status following this deemed as adequate.

The Tissue Viability team overseeing his care prescribed NPWT to manage wound exudate, odour and expedite wound healing, whilst simultaneously reducing dressing change frequency and improving quality of life.

## Method

The VENTURI® Avanti NPWT device from Talley Group (Figure 1) was chosen by the Tissue Viability Team at Hampshire Hospitals NHS Foundation Trust as it is intuitive, easy to use and with a capacity of up to 1200ml is indicated for use on large wounds where exudate levels can be high. Furthermore, the use of an occlusive or semi-occlusive wound dressing with a closed NPWT system can help manage issues around wound odour.

With the use of a portal drain, continuous therapy at -80mmHg was applied to both wounds and a honey-based dressing was used in conjunction with NPWT whilst the *pseudomonas* infections were present.



FIGURE 1.  
VENTURI Avanti NPWT Device.

### Abdominal wound

During the eight-week NPWT treatment time, dressings were changed twice weekly. A foam wound filler was initially used for a nine-day period, however a gauze wound filler was utilised for the remainder of the NPWT treatment period as it was easier to manipulate into the wound and around the fistula.

The fistula was isolated to ensure the output of fluid remained separate from the NPWT. Stoma paste and stoma rings were used to build up around the fistula, the film was then cut around the paste and a stoma bag applied to allow free drainage. Due to the proximity of the stoma to the wound edge, it was difficult to maintain the dressing seal.

Over granulation was noted prior to the discontinuation of NPWT, this resolved in 7 days with appropriate treatment.

### Neck wound

Throughout the four-week treatment period of NPWT, a gauze wound filler was utilised as it was easy to use and manipulate into the wound cavity. A silicone-based dressing was used as a wound contact layer during the first three weeks of therapy to protect underlying structures.

Achieving and maintaining a vacuum seal proved challenging due to thick skin folds in this area. Dressing changes were complicated further by ET tube placement and neck stiffness.

The wound was dressed twice weekly.

## Results

During the course of NPWT treatment both wounds demonstrated significant healing as follows;

### Abdominal wound

Following eight weeks of NPWT the wound area measured 84cm<sup>2</sup>, equating to an overall reduction of 50%, and with full granulation to skin level, the wound volume was reduced to zero. Progression of wound healing can be seen in Figure 2.

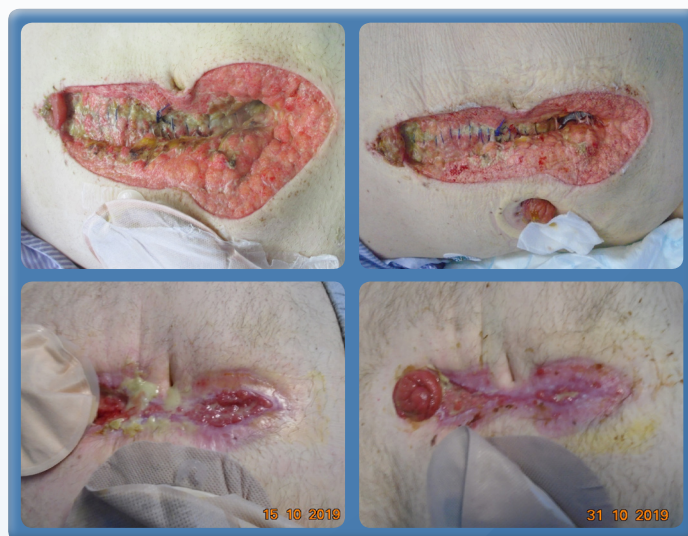


FIGURE 2.  
Abdominal wound pre, intra and post treatment with the VENTURI AVANTI NPWT system. Mucous fistula noted to top end of wound with the stoma adjacent to the wound edge.

### Neck wound

During the 4 weeks of NPWT there was a 70% reduction in wound area, with the measurement decreasing to 42cm<sup>2</sup>. The wound fully granulated reducing the volume to zero. See Figure 3.



FIGURE 3.  
Neck wound pre, intra and post treatment with the VENTURI AVANTI NPWT system.

Quality of life issues arising from wound odour and pain were also resolved as a result of using the Venturi AVANTI NPWT system and following the removal of NPWT both wounds progressed to full healing with the use of conventional dressings.

Systemic antibiotics were given to treat the patient's wound infections and these resolved whilst the NPWT was in place.

## Discussion / Conclusion

Despite the complex challenges faced with this patient, such as a high BMI, diabetes, Factor V Leiden Thrombophilia, and the difficulties encountered with the practical application of dressings, healing was achieved in both wounds with the use of NPWT.

In addition to the rapid wound healing, this case highlights that the Venturi advanced NPWT system used can have a positive impact on patients' quality of life as it offers clear benefits in terms of managing wound exudate, odour and pain. Furthermore its use reduced the frequency of dressing changes and had minimal impact on the patient's ongoing rehabilitation, his daily life and learning to manage his stoma.

With acute care facilities facing a year-round struggle with bed availability and the associated cost of wounds to the NHS, any interventions that can expedite healing, improve patients quality of life by managing wound symptoms and reduce patient length of stay can offer significant added value to care providers, whilst minimising the impact for the patient.

## References

1. Posnett J, Franks PJ. The Burden of Chronic Wounds in the UK. *Nursing Times*. 2008;104(3):44-45.
2. Kapp S, Miller C, Santamaria N. The quality of life of people who have chronic wounds and who self-treat. *Journal of Clinical Nursing*. 2018;27:182-192.
3. Moffatt C, Mappleback L, Murray S, Morgan P. The experience of patients with complex wounds and the use of NPWT in a home care setting. *Journal of Wound Care*. 2011;20(11):512-527.
4. Guest JF, Ayoub N, McIlwraith T, Uchegbu I, Gerrish Weidlich D, Vowden K, Vowden P. Health economic burden that wounds impose on the National Health Service in the UK. *BMJ Open* 2015;5:e009283. doi:10.1136/bmjopen-2015-009283.



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