

# A clinical case study on a dehisced abdominal wound using the VENTURI™ Negative Pressure Wound Therapy system

Fiona Kelly, Tissue Viability Nurse, North Cumbria Acute Hospitals NHS Trust, West Cumberland Hospital  
Helena Foster RGN, Group Clinical Manager, Talley Group Limited

## Introduction

Despite improvements in pre-operative care over recent years, the rate of surgical wound dehiscence has not decreased; the international literature reports that 1% - 2.6% of patients experience wound dehiscence (*Waqar et al., 2005*).

This multi-factorial problem is associated with several predisposing factors which include anaemia, hypoproteinaemia, malnutrition, obesity, malignancy, jaundice, use of steroids, and diabetes (*Sorensen et al., 2005*). Gender and advanced age are also associated with wound disruption. Older male patients are more likely to experience wound dehiscence than women - the ratio is 2 to 1. (*Hanif et al., 2000*).

Certain surgical interventions also lead to an increased incidence of wound dehiscence; these include procedures for colon diseases, peptic ulcer disease, and emergency laparotomy (*Waqar et al., 2005*).

Post-operatively, both systemic and local factors can contribute to wound dehiscence. Surgical technique may be a causative factor, for example, sutures or staples placed too far apart, under too much tension, or too close to the incision edges may prevent the tissue from meeting and binding together properly. Sutures that are too tight can result in strangulation of the wound edges, causing necrosis. Dehiscence may also occur when sutures are removed too early, especially in wounds that do not have adequate buried absorbable sutures to provide tensile strength. Deep wound infection and increased abdominal pressure are other significant causes of wound disruption.

Nevertheless, complete wound dehiscence is an unwelcome post-operative complication and is associated with high morbidity and mortality rates.

The following case study concentrates on the management of a dehisced abdominal wound using the VENTURI™ Negative Pressure Wound Therapy (NPWT) system from Talley Medical.

## Assessment of the Patient and the Wound

- 72 year old male
- Past medical history: myocardial infarction, bowel surgery, asthma, COPD
- Surgical procedure: Incisional hernia repair, followed by resection of ischaemic tissue, right and left flank regions
- Following surgery all wounds were dressed daily with a hydrogel and foam dressing

Eight days post-operatively the incisional wound dehisced, and the decision was made to commence treatment with the VENTURI™ NPWT system to manage all three wounds.

The wound was photographed prior to commencing treatment (Fig 1, Day 1). It is evident from the photograph that the remaining sutures still in situ were under intense pressure. It was predicted that the wound would breakdown further, which it did.



Fig. 1 (DAY 1)

## Method

The interface through which negative pressure is applied when using the VENTURI™ NPWT system is moistened AMD (anti-microbial dressing) gauze and a silicone drain.

**Wounds 1 & 2:-** In this case, a layer of saline moistened AMD gauze was placed on the dehisced wound bed. The flat drain was cut to size, 1-2 cms from the wound edge to allow for contraction. The drain was then placed on top of the gauze lining the wound bed and the remaining saline moistened gauze was used to fill the wound and fluffed up to skin level. Initially, the lower wound was bridged to the larger wound, moistened gauze was placed into the lower wound, the intact skin was protected with a transparent film and a moistened gauze wick bridged the two wounds.

The wound on the patient's right flank was also bridged to the large dehisced incisional wound. Again the intact skin was protected. Both wounds were then covered with a transparent film. This ensured an air tight seal and a moist wound healing environment were maintained (*Chariker-Jeter et al, 1989*).

**Wound 3:-** The wound on the patient's left flank was managed with a flat drain. A layer of saline moistened AMD gauze was placed on the wound bed. The drain was cut to size, 1-2 cms from the wound edge to allow for contraction, the drain was then placed on top of the gauze lining the wound bed, the remaining saline moistened gauze was used to fill the wound and fluffed up to skin level. The wound was then covered with a transparent film.

Both drainage tubes were connected via a Y-connector to the canister. The pressure was set at 80mmHg.

## Results

**Day 15:** Two weeks after NPWT commenced, a further photograph was taken (Fig 2). The wound bed had approximately 50% of slough present. The patient was discharged from hospital and NPWT continued in the homecare setting.

**Day 32:** The wound was reviewed. Sloughy areas were still present; therefore, a hydrogel was used in conjunction with the VENTURI™ system in order to soften/moisten the slough.

**Day 42:** A reduction in the amount of slough is shown on the wound bed (Fig 3). Healthy granulation tissue is present; however the peri-wound area appears red and excoriated. NPWT continued and a no sting barrier film was applied to the peri-wound area. The patient himself commented that he had sensitive skin

**Day 56:** It is evident that all wounds have decreased in size. The right flank wound has healed (Fig 4). Granulation tissue is present in both the left flank and incisional wounds (Fig 4.1 and 4.2). The left flank wound was now managed with a foam dressing.

NPWT continued on the incisional wound, however, the top of the incisional wound was over-granulating; therefore, a foam dressing was applied to this area to inhibit the over-granulation. Fig 4.3 shows the dressings insitu.

## Discussion

Nursing staff found the application and removal of the dressing simple and straightforward. The use of moistened AMD gauze was extremely beneficial, enabling manipulation of the gauze to all jagged wound edges and undermined areas.

The VENTURI™ pump unit was easy to operate and very quiet whilst therapy was in progress.

The VENTURI™ canisters were easy to change, saving valuable nursing time.



Fig. 2 (DAY 15)



Fig. 3 (DAY 42)



Fig. 4 (DAY 56)



Fig. 4.1 (DAY 56)



Fig. 4.2 (DAY 56)



Fig. 4.3 (DAY 56)

The patient's independence throughout the therapy was maintained. Whilst at home a shoulder bag was provided so that normal activities of daily living continued.

The management of this wound presented nursing staff with some of the everyday problems clinicians face in wound care, such as removal of slough, protecting the peri-wound area and managing over-granulation tissue. All of the above were managed successfully in conjunction with the VENTURI™ NPWT system which ultimately provided a positive patient outcome.

## Conclusion

Wound dehiscence is an unwelcome complication of abdominal and other surgeries. With or without evisceration, it can be potentially fatal. There is no doubt that wound dehiscence will continue to be a problem encountered by clinicians within today's surgical arena. Nevertheless, the management of the dehisced wound has evolved over the years and the VENTURI™ Negative Pressure Wound Therapy system is a viable, simple and easy to use alternative to conventional treatments.

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**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](http://www.talleygroup.com)

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