The use of a Talley VENTURI™ negative pressure wound therapy unit in a case of necrotising cellulitis

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Introduction

The thousand-year-old Chinese practice of "cupping", or the application to the skin of glass cups containing heated air so as to create a slight fall in pressure and a localised hyperaemia, may be considered a first rudimentary form of the application of a partial vacuum to a wound, to stimulate healing[1].

Many recent studies, from 1952 to the present, have demonstrated the beneficial effect of the application of subatmospheric pressure to the wound bed (negative pressure wound therapy or NPWT) in terms of the acceleration of the healing process; however, the exact physico-chemical mechanisms that lead to this have not yet been fully clarified.

Modern negative pressure wound therapy involves the use of a suction unit (electric pump) or connection to a hospital vacuum line to apply negative pressure to the wound through a sealed dressing. There are a number of suppliers of NPWT equipment that differ mainly in the ways in which the negative pressure is applied to the wound bed, and there is ongoing debate about which way is more or less efficacious[2].

The two application methods are the Argenta-Morykwas method, which uses a polyurethane foam dressing, and the Chariker-Jeter method, which uses a silicone drain and moistened antimicrobial gauze. In both cases a transparent dressing keeps the application site airtight.

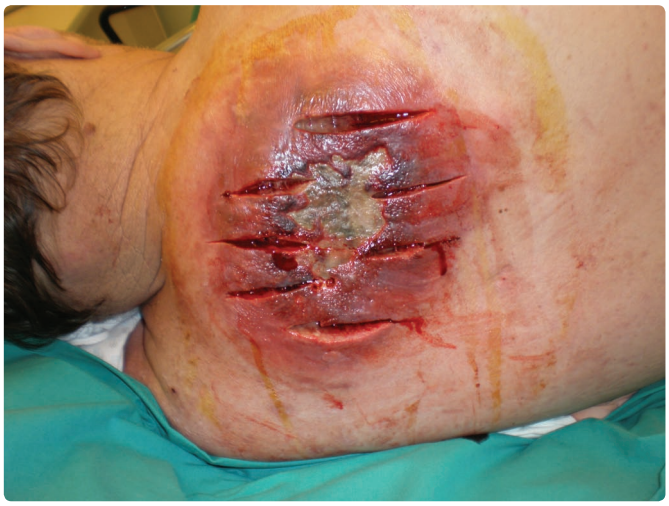
The objective of this study is to evaluate the effective utility of negative pressure therapy in certain types of wound.

Assessment of the patient and wound

The patient, a 66 year-old male with non insulin-dependent diabetes, receiving treatment with oral anticoagulants for chronic atrial fibrillation, was admitted with fever of unknown origin.

On admission to the ward he presented with an extensive oedematous intrascapular necrotic wound of 11cm x 13cm in size, that had been treated by the dermatologists with transverse incisions and subsequent dressing with iodoform gauze.

More in-depth investigations led to a diagnosis of necrotising cellulites, and on 22/5/2008 the wound was surgically debrided, with removal of the necrotic tissue, immediately followed by the application of negative pressure using a VENTURI™ NPWT system (Talley Medical, UK, distributed in Italy by Sanitaria Scaligera, Verona).



Initial aspect of the wound on 22nd May. The necrotic area is evident.

The wound, photographed before surgical debridement, was photographed again before the application of the negative pressure, and the subsequent development was documented photographically.

Method

The NPWT system used (Talley VENTURI™) consists of a mains or battery suction pump that uses the Chariker-Jeter method already described (moistened gauze and silicone drain) to apply negative pressure to the wound.

In the case examined, NPWT was applied to the wound on 22/5, using the disposable wound sealing kit provided.

The protocol recommended by the manufacturer was followed, firstly applying a piece of non-adhesive dressing in contact with the wound bed, and over this a piece of antimicrobial gauze moistened with the saline solution contained in the wound sealing kit, with the flat silicone drain over this, trimmed to fit and wrapped in more moistened antimicrobial gauze. The whole dressing was then sealed to the skin with a transparent film dressing.

The suction was then switched on, set on continuous therapy mode at a pressure of 80mmHg, and the seal of the dressing was checked.

Dressing changes were every 48 hours and the canister was replaced when it became full. Initial exudate production was around 70cc per day.

Results

On day 3 (25/5) the wound was 14cm x 8cm in size, approximately 2cm deep, with a fibrin bed.

On day 6 (28/5) the fibrin bed had increased. Exudate production was around 50-70cc per day. The wound was surgically debrided a second time, after which the situation started to improve visibly, with a reduction in exudate volume to 30-40cc per day, and the results documented below were obtained.

When dressed subsequently, the wound in fact presented a clean and no longer infected appearance. New granulation tissue was present in the wound bed, as documented by the photographs.

On day 20 (11/6) the wound had reduced in size to approximately 11cm x 7cm, with half the depth (0.8cm), and few secretions.

On day 24 (15/6) we decided to discontinue the negative pressure treatment, considered no longer necessary by then, and to continue treatment with a silver-based dressing.

Evaluation

In our view, the use of the negative pressure therapy was decisive, and allowed us to obtain good tissue growth and cleansing of the wound in a relatively short period of time, a time which we would not have obtained with traditional dressings because of the abundant exudate, particularly in the initial phase of treatment.

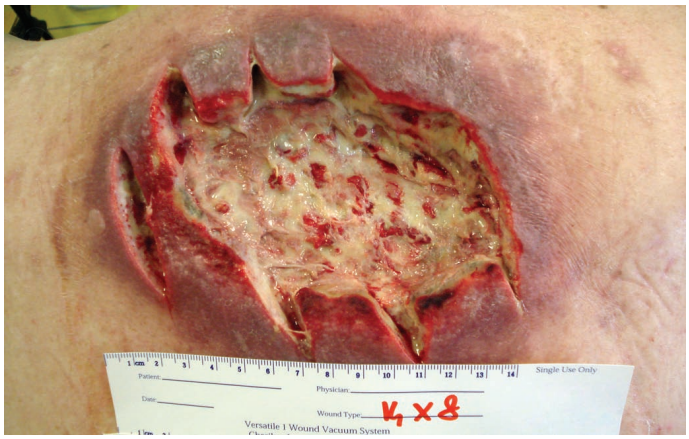
Personally, I had no difficulty using the moistened gauze and silicone drain, perhaps also because of the anatomical position of the wound, which made it easy to manage.

The use of the VENTURI™ unit was well tolerated by the patient, who maintained his independence, making alternate use of the mains and battery power supplies.

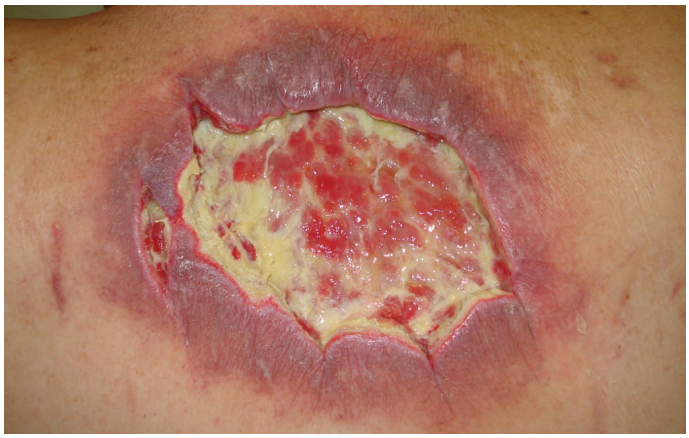
Conclusions

On the basis of this experience, I consider this management strategy a valid alternative to the traditional method, although it must be recalled that the patient was self-sufficient and collaborated fully.

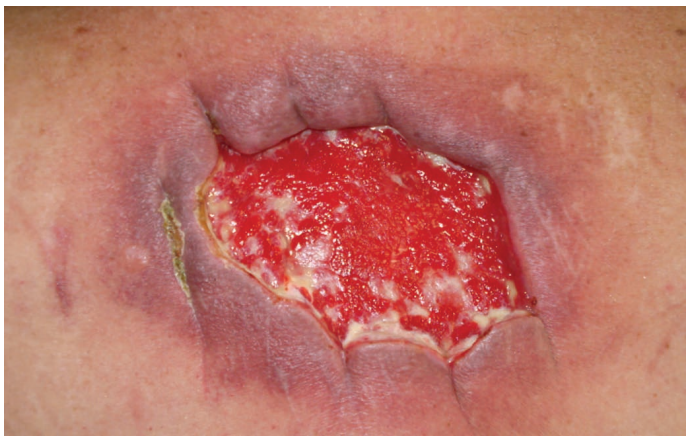
As a whole, the experience was positive both in terms of managing the equipment, and the treatment results obtained in the 24 days.



Appearance of the wound on 25th May, after surgical debridement.



Appearance of the wound on 3rd June.



Appearance of the wound on 15th June (end of study).

References

1. Kamolz, L. P., Andel, H., Haslik, W., et al. (2004) Use of subatmospheric pressure therapy to prevent burn wound progression in human: first experiences. *Burns 2004*; 30(3): 253-58.

2. Miller, M.S., Lowery, C.A. (2005) Negative Pressure Wound Therapy: "A rose by any other name". *Ostomy Wound Management*, 2005 Mar; 51(3):44-6, 48-9

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