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Handy-Vac: An economic alternative to the conventional vac therapy

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Abstract

VAC studies have always been unclear due to lack of content and its actual use for wounds. Conventional VAC therapy is usually an exorbitant pick due to high priced machines and unnecessary hospital stay irrespective of the wound size. Meanwhile, the larger sized wounds would definitely need a proper hospital stay, a VAC machine a healthcare worker who knows to handle it; why not use a handy equipment for smaller sized wounds which could be handled by the patient itself? Enter, HANDY-VAC, a low cost equipment which is convenient, requires no hospital stay and most importantly can be handled by the patient itself.

Keywords: Handy-VAC, vac, economical

Introduction

A wound is defined as damage or disruption to the normal anatomical structure and function. This can range from a simple break in the epithelial integrity of the skin or it can be deeper, extending into subcutaneous tissue with damage to other structures such as tendons, muscles, vessels, nerves, parenchymal organs and even bone. Wound healing remains a challenging clinical problem and correct, efficient wound management is essential. The primary aim of the practicing clinicians is to achieve a high rate of success in the wound healing. In the countries like India, where the chances of wound infection are high due to multiple issues, the importance of novel techniques of wound care is essential. The scientific community has always looked for a new and more effective wound care techniques, particularly with an emphasis on new therapeutic approaches and the development of technologies for acute and chronic wound management. So far very few remarkable achievements have been reported in the scientific literature. Despite numerous advances, chronic and other difficult to manage wounds continue to be a challenge for the clinicians. The relatively newer techniques like negative pressure wound therapy (NPWT) using the vacuum assisted closure (VAC) are very promising and are also useful in the management of difficult to heal wounds. In this short review, we highlight the importance of the negative pressure wound device (NPWD) in the successful wound healing. We will also discuss the importance of this technique in a developing country like India. The practice of exposing a wound to sub-atmospheric pressure is relatively new and was first described by Fleischmann *et al.* in the year 1993, who first reported the use of sub-atmospheric pressure for an extended period to promote debridement and healing following the successful use of this technique in 15 patients with open fractures [1, 4]. Their study reported that the treatment method of reducing the pressure inside the wound was very effective. However, the first reports about the use of negative pressure wound device came from Argenta and Morykwas in the year 1997 [2]. The use of controlled levels of negative pressure application has been shown to accelerate debridement and promote healing in various types of wounds [3]. This optimum level of negative pressure appears to be around 125 mmHg below ambient and there is evidence that this is most effective if applied in a cyclical fashion of five minutes on and two minutes off [3]. Earlier studies used more conventional methods such as a wall suction apparatus or surgical vacuum

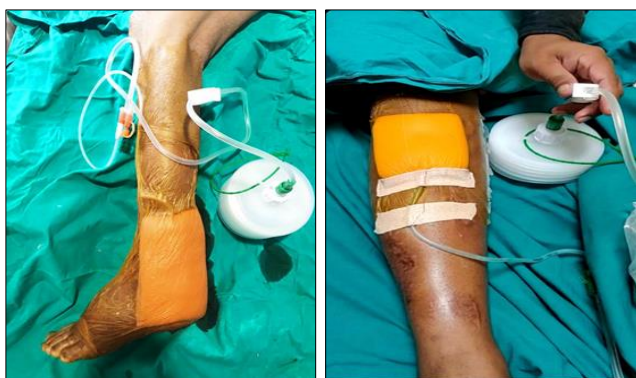
bottles for creating the negative pressure [3]. However, there were multiple problems present in the use of these conventional methods [4]. Chronic wound management represents a considerable burden on health services and requires considerable manpower, frequent specialist consultation, and adjunct therapies. The negative pressure wound therapy (NPWT) is an important adjunct, VAC studies have always been unclear due to lack of content and its actual use for wounds. Conventional VAC therapy is usually an exorbitant pick due to high priced machines and unnecessary hospital stay irrespective of the wound size. Meanwhile, the larger sized wounds would definitely need a proper hospital stay, a VAC machine a healthcare worker who knows to handle it; why not use a handy equipment for smaller sized wounds which could be handled by the patient itself. In this study we introduce Handy-Vac, low cost equipment that is convenient, requires no hospital stay and most importantly can be handled by the patient itself.

Evidence behind Cost Effectiveness

NPWT benefits include rapid wound granulation, epithelialization and contraction, reduction in frequency of dressing changes, reduced infection risk, reduced treatment costs, control of exudate, concurrent rehabilitation, and better patient tolerance. Fleischmann *et al.* gave the first description of the NPWT in a series of patients in 1993. Morykwas *et al.* and Morykwas [5, 6] initially described the efficacy of NPWT.

There is a substantial literature on NPWT including reports of both comparative and non-comparative clinical studies, case studies, economic analyses, literature reviews, and technology assessments. Most studies demonstrate the superior or at least the same efficacy as compared to the conventional wounds management. But due to heterogeneity in types, sites and duration of wounds the results cannot be generalized. After a thorough literature search, we concluded that NPWT is efficacious and cost effective method of wound management not only in chronic but also for acute wounds.

Materials and Methods



Using a Handy-Vac of Size 14, provides a pressure of around 80-100mmhg

A surgical drain was used as a Handy-Vac of Size 14 provides a pressure of around 80-100mmhg which is optimal for smaller wounds. Along with the drain were a plastic tube and sterile foam of convenient size. The wound was securely sealed with an antimicrobial incise drape. We performed a case series of Handy-Vac therapy over 5 days on smaller wounds (<10cm) like chronic leg ulcers,

infective wounds and compound wounds of already fixed fractures. The primary objective was to assess the success (defined as a reduction in wound area of at least 50% at 1 month) using Handy-Vac. Ten patients with smaller wounds present for over one month were included.

Method

The VAC involves a six-step method. The following are the VAC steps, the foam dressing is cut to the approximate size of the wound with scissors and placed gently into position→ The perforated drain tube is then located on top of the foam and a second piece of foam placed over the top. For shallower wounds, a single piece of foam may be used and the drainage tube is inserted inside it→ The foam, together with the first few inches of the drainage tube and the surrounding area of healthy skin, is then covered with the adhesive antimicrobial incise drape. At this stage it is important to ensure that the membrane forms a good seal both with the skin and the drainage tube →. The distal end of the drain is connected to the Handy-Vac unit, which is programmed to produce the required level of pressure→ Once the vacuum is switched on, the air is sucked out of the foam causing it to collapse inwards drawing the edges of the wound in with it→ Fluid within the wound is taken up by the foam and transported into the Handy-Vac unit. The patient is taught the basic steps of cleaning and charging the drain and sent home and is asked to follow up in 1 week for cleaning and re-charging the drain.

Indications and contraindications for the use of Handy-VAC

Indications

1. Acute or traumatic wounds.
2. Sub-acute wounds. (E.g.: dehiscent incisions)
3. Diabetic ulcers
4. Flaps
5. Meshed grafts
6. Pressure ulcers.

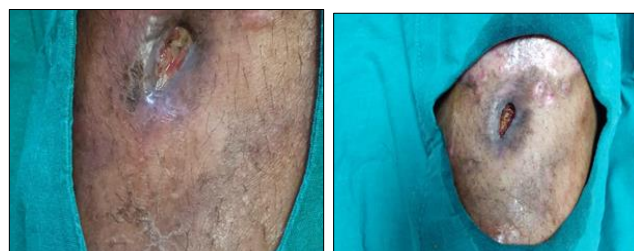
Contraindications

1. Fistulas
2. Wounds more than 10 cm in size.
3. Necrotic tissue in eschar
4. Untreated osteomyelitis
5. Malignancies

Results

We observed very good results with Handy-Vac with almost 50% reduction in the wound size of 7 patients out of 10 with the other 3 having a reduction of less than 50%.

Patient no.1



Pre Handy-Vac

Post Handy-Vac (1 month)

Patient no.2

Pre Handy-Vac



Post Handy-Vac (healthy)

Patient no.3

Pre handy-Vac



Post Handy-Vac (<50% Reduction)

Table 1: List of Patients with Post Vac Reduction of Wound Size

Patients	Age/Sex	Wound size reduction
1	43/M	50%
2	54/F	60%
3	26/F	40%
4	70/M	50%
5	65/F	50%
6	23/F	60%
7	36/M	30%
8	56/M	40%
9	64/F	70%
10	45/M	50%
Total: 10	Average: 48.2 Yrs	Average: 50%

Conclusion

Handy-Vac is a good economical alternative for smaller wounds as the patient needs no hospitalization and additional charges.

Limitations of the study

1. The Handy-Vac cannot be used for wound sizes of more than 10 cms.
2. The patient has to recharge and clean the drain on a regular basis.

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