

Assessment of Wound Closure Methods in the Management of Open Injury: A Comparative Analysis

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Abstract

Background: The current research was performed to establish the efficiency of vacuum assisted closure dressings in enhancing the healing procedure in chronic wounds, as compared to standard moist wound dressings. **Subjects and Methods:** Whole of 30 subjects were incorporated in the research. The included subjects were divided into two groups: Group 1 included subjects were treated with conventional dressings and in group 2 the included subjects were treated with VAC dressings. The subjects were informed about the study procedure and the written informed consent were obtained prior to the start of study. **Results:** Decrease in Wound Size. There was noteworthy diminish in wound size from day 0 to day 8 in VAC group in contrast to saline-wet-to-moist group. There was noteworthy reduce in the bacterial growth in the VAC group as compared to saline-wet-to-moist group. **Conclusion:** VAC therapy is not the answer for all wounds; however, it can make a significant difference in many cases. VAC is a helpful instrument in poignant a wound to a point where more conventional dressings or more easy surgical reconstructive methods can be utilized. Present research concludes that negative pressure wound therapy is a helpful choice for management of wounds when compared to treatment with conservative dressing's therapy in terms of contraction of wound, time occupied for wound healing and length of hospital stay.

Keywords: Conventional dressing, Healing, Vacuum assisted, Wounds.

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Introduction

Wound healing is a compound and vibrant procedure that includes an instant succession of cell migration leading to restore and closure. This succession begins with removal of debris, control of infection, declaration of granulation tissue, contraction.^[1,2] Acute and chronic injuries are a important reason of morbidity and poor quality of life. They influence a smallest of 1% of the inhabitants and symbolize a big hazard for hospitalization, amputation, sepsis, and even demise. The management of big wounds remains a noteworthy challenge to practitioners, a source of pain and uneasiness to the subjects and is expensive.^[3]

Open injuries are widespread and strict injuries that frequently influence young male subjects. Enhancements in their treatment have been made during the current years. Nevertheless an infection with its complications still relics to be a chief trouble, particularly in management of Gustilo type III open fractures for primary closure of the wounds in this kind of fractures is frequently impractical. Thus the vacume assisted wound therapy (VAWT) has become a therapy of option for numerous surgeons.^[4,5]

The management of chronic, open wounds is changeable and expensive, challenging long hospital stays or dedicated home care requiring skilled nursing and expensive supplies. quick healing of chronic wounds could consequence in decrease hospitalization and an previous return of function. A process that advance the healing process could really reduce the risk of infection, amputation, and extent of hospital stay and consequence in an approximate possible annual savings of billions of rupees of healthcare cost.^[6,7]

Vacuum-assisted closure would possibly be a universally established approach for dressing. It is a method of lowering air pressure around a wound to advance the healing process. During a VAC procedure, foam bandage is functional over an open wound, A vacuum pump is necessary to make negative pressure around the wound. The pressure over the wound is fewer than the pressure in the atmosphere. When applying negative pressure onto the bed of the wound, there is exclusion of Fluid material, configuration of granulation tissue is promoted, and Wound edge estimate is promoted.^[8,9]

The current research was performed to conclude the efficiency of vacuum assisted closure dressings in enhancing the healing procedure in chronic wounds, as compared to

normal moist wound dressings.

Subjects and Methods

The present research done in the department of general surgery. All the subjects with the ulcers and wounds in the upper and lower limbs in the OPD of the surgical department and the emergency department of the medical college & associated hospital were included in the study. The ethical clearance certificate was obtained from the ethical committee.

Whole of thirty subjects were incorporated in the research. The incorporated subjects were divided into 2 groups: Group 1 incorporated subjects were treated with conventional dressings and in group 2 the incorporated subjects were treated with VAC dressings. The subjects were informed about the study procedure and the written informed consent were obtained prior to the start of study.

All subjects above 18 years of age with open injuries in upper and lower extremities that requisite treatment procedures were incorporated in the research. Subjects with preexisting osteomyelitis in the wounds, diabetics, malignancy, and peripheral vascular disease were disqualified from the research.

Personal history was recorded. The subjects were prospectively randomized into one of the 2 management groups receiving each the vacuum assisted closure therapy or standard saline-wet-to-moist wound care. Files were marked with red or yellow labels on the inside panel and were arbitrarily organized.

Detailed examinations of all the subjects along with the required investigations were done. The wound was thoroughly debrided and the area of injury was examined and assessed. In group 1 day by day dressing by conventional methods. In group 2 subjects a double layer of polyethylene sheets was whispered firmly in place over the wound, and an sketch of the wound was traced using a permanent marker. The tracing made on the top layer of polyethylene was fixed against a graphic grid, and its area was quantities to calculate the area of the wound to the adjacent 4 mm². At following dressing changes, the wound was like wise photographed, and its region was quantitated by the double polyethylene sheet technique. prior to surgical intervention at the conclusion of therapy, the closing manifestation of the wound was again distinguished and recorded.

Biopsies were acquired from the four corners and the generally “healthy” part of the wound bed. Samples were taken on day zero, day four, and day eight. Whichever difficulties connected with vacuum assisted closure therapy were also documented. Data from this study were statistically analysed using the SPSS Statistics version.

Results

The mean age of the subjects in group A was 48.54±16.45 years and in group B 52.2±18.9 years which were not significant. (p>0.05). There was male preponderance in both the groups.

As per the number of debridement done in both the groups

were analyse as follows: 6 subjects underwent 0 debridement, in 22 subjects 1 debridement was done and in 2 subjects, 2 debridement was done in group A, in group B 18 subjects underwent 0 debridement, in 12 parients 1 debridement was done and 2 subjects underwent 2 debridement.

There was noteworthy diminish in wound size from day zero to day eight in group A in comparison to group B. (Tables 1) There was significant decrease in the bacterial growth in |Group A compared to B. (Table 2) On histological comparison also, there was a statistical dissimilarity among the both groups

Table 1: Decrease in wound size from day 0 to day 8

Measurements	Group A (n = 15)	Group B (n = 15)
1 – 4	12	5
5 – 9	1	0
10 - 14	2	5
15 – 19	0	1
20 – 24	0	2
> 25	0	2

Table 2: Difference in bacterial growth

Bacterial Growth	Group A Subjects			Group B Subjects		
	Day 0	Day 4	Day 8	Day 0	Day 4	Day 8
Present	15	14	10	15	11	7
Absent	0	1	5	0	4	8

Discussion

Wound healing has to be hastened and early cover with skin grafting results in decreased hospital stay and subject suffering. But it is observed that despite correction of local and systemic factors wound takes longer time to heal results in increased morbidity.^[10,11,12]

Priyatham et al,^[13] conducted research assessing the effectiveness of vacuum assisted closure as compared to straight moist wound dressings in recovering the healing procedure in chronic wounds accounted shorter period of hospital stay was observed in the vacuum dressing group, they also observed Increased rate of granulation tissue formation was seen in to vacuum dressing group when compared to conventional dressing group. K Singh et al,^[14] reported that percentage of granulation tissue formation in the study group was 81.0±8.29 and in the control group was 53.60±19.23, which was found to be statistically significant. The present study showed in group B subjects who were dressed with VAC method at end of day 4 there were 20% of subjects who did not showed an bacterial growth and at end of day 8 in 60% subjects did not showed any bacterial growth. Whereas in group A at the end of 8 days only 20% subjects had no bacterial growth. In the similar studies by Argenta, Banwell et al and Morykwas et al showed similar findings.^[15,16]

In the present study there was decrease in size of wound in 27% of subjects in group B where the subjects were treated with VAC method. A diminish in size of 10 to 19.9mm was observed in 47.46% of subjects of VAC group and only 8.36% in control group. There have been similar studies by Joseph et al. and Morykwas et al. which showed that VAC proved effective in shrinking the widths of wound over time compared to standard wound dressings.

In the standard wound dressing procedure; we adhere to devitalized tissue and in six hours the gauze can be removed along the tissue. This leads to mechanical debridement. There have been criticized on this current method of wound care, it remove the viable tissue along with non-viable tissue. Such method of wound dressing is traumatic to granulation tissue as well as new epithelial cells. The use of VAC method is simple, safe and short method.

VAC treatment can make a noteworthy dissimilarity in numerous cases. VAC is a helpful tool in touching a wound to a direct where additional traditional dressings or more simple surgical reconstructive process can be utilized.

Conclusion

Negative pressure wound therapy is a helpful option for management of wounds when compared to management with conventional dressing's therapy in terms of contraction of wound, time taken for wound healing and period of hospital stay.

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