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To study the effectiveness of vacuum assisted closure in reducing the dimension of wound

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Abstract

Method: Informed consent taken in the vernacular language. Wounds of the patients rectangularized while doing debridement for the purpose of measurement. Maximum transverse diameter is taken and a line parallel to the perpendicular line dissecting it through midpoint is taken. Sample collection (As per microbiological parameters) for the purpose of bacterial load done after debridement of wound under aseptic precaution. VAC will be applied as per the norms and setting noted. Measurement of wound dimension and wound assessment score done at the time of application of VAC /Dressing & after removal of VAC / Dressing after 8 days. Sample for bacterial load and type of bacteria send prior and after application of VAC / Conventional dressing. Bacterial load and type of bacteria, noted as per microbiological report.

Result: The above table shows the comparison of Mean age of patients of two groups. The student T test applied to determine the difference between the mean age of patients of two groups which was found to be non significant ($P>0.05$). The mean age of Dressing group (40.90) is higher than mean age of VAC group (39.50) but no significant difference was found between their mean age.

The above table shows the comparison of Mean reduction in wound area of patients of two groups. The student T test applied to determine the difference between two Groups at Pre and Post time interval which was found to be statistically significant ($P <0.05$). The mean difference in wound area of VAC group (17.933) is significantly higher than the mean difference in wound area dressing group (8.300) which means that the improvement of affected wound area at pre and post time interval is large in VAC group.

Conclusion: This is a prospective cohort study of 60 patients, 30 cases (male 20, female 10, mean age 39.5 years) and 30 control (male 23, female 7, mean age 40.9 years) with infected wounds treated using VAC. The use of the VAC led to a mean reduction of 17.93 cm², while with conventional Dressing mean reduction of 8.3 cm², in the wound area ($p <0.05$).

Keywords: Vacuum, assisted closure, dimension & wound

Introduction

Complex wounds are a growing medical problem throughout the world. Ageing population, increasing prevalence of type II diabetes mellitus along with increasing rates of obesity, traumatic exposure, all contribute to the rapid incidence of chronic wounds. It is estimated that nearly 1.5 to 2 million persons are injured and 1 million succumb to death every year in India, majority develops chronic complex wound. A variety of wound care systems being used now day's & in the process of being developed, broadly referred to as vacuum assisted closure therapy, (Formerly known as Negative Pressure Wound Therapy). In particular, systems that apply an interface material to evenly distribute vacuum to wounds, while causing microde formations, have been referred to as Microde formational Wound Therapy (MDWT) ^[1].

Vacuum Assisted Closure or VAC[®], based on the pioneering work of Argenta and Morykwas ^[2]. These novel therapy have been shown to facilitate the healing of various types of wounds derived from trauma, infection, neuropathic, diabetes and tumors. The variety of clinical trials & fundamental studies in this field provided us with a more detailed understanding of the observed clinical effects as well as the mechanism of action at tissue, cellular, and molecular levels.³

Material & Method

Source of Data

All patients of infected wounds who are undergoing VAC therapy / conventional dressing for

their wound management, in department of surgery, M.G.M Medical College and M.Y Hospital, Indore. The study will include prospective cases 1 year from date of approval from Feb 2018 Jan 2019.

Method of collection of data

1. Informed consent taken in the vernacular language.
2. Wounds of the patients rectangularised while doing debridement for the purpose of measurement.
3. Maximum transverse diameter is taken and a line parallel to the perpendicular line dissecting it through midpoint is taken.
4. Sample collection (As per microbiological parameters) for the purpose of bacterial load done after debridement of wound under aseptic precaution.
5. VAC will be applied as per the norms and setting noted.
6. Measurement of wound dimension and wound assessment score done at the time of application of VAC /Dressing & after removal of VAC / Dressing after 8 days.
7. Sample for bacterial load and type of bacteria send prior and after application of VAC / Conventional dressing.
8. Bacterial load and type of bacteria, noted as per microbiological report.

Sample size: 30 cases and 30 Control.

Inclusion criteria

1. All patients who are undergoing VAC/ conventional dressing for management of wounds.
2. Patient of age group between 18 years to 60 years.
3. Patients of both gender.
4. Patients who give written informed consent.

Exclusion criteria

1. Patients with age group less than 18yrs and more than 60 yrs.
2. Patients under VAC therapy but having peripheral vascular disease/ varicose veins.
3. Patients not willing to give writing consent.

Results

Table 1: The comparison of Mean age of patients of two groups.

Group	N	Mean	Std. Deviation	T Test	P Value	Result
VAC	30	39.500	12.238	-0.457	0.649	Non-Significant
Dressing	30	40.900	11.463			

Student T test applied

The above table shows the comparison of Mean age of patients of two groups. The student T test applied to determine the difference between the mean age of patients of two groups which was found to be non-significant ($P>0.05$). The mean age of Dressing group (40.90) is higher than mean age of VAC group (39.50) but no significant difference was found between their mean age.

Table 2: Comparison of mean reduction in wound area of two groups

Group	N	Mean	Std. Deviation	T Test	P Value	Result
VAC	30	17.933	5.638	8.357	0.000	Significant
Dressing	30	8.300	2.842			

Student T test applied

The above table shows the comparison of Mean reduction in wound area of patients of two groups. The student T test applied to determine the difference between two Groups at Pre and Post time interval which was found to be statistically significant ($P<0.05$). The mean difference in wound area of VAC group (17.933) is significantly higher than the mean difference in wound area dressing group (8.300) which means that the improvement of affected wound area at pre and post time interval is large in VAC group.

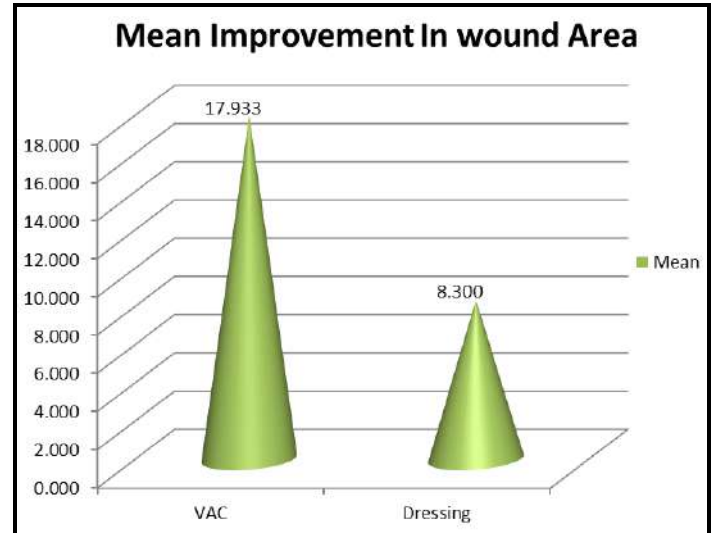


Fig 1: Comparison of mean reduction in wound area of two groups

Discussion

In this study, healthy infection-free granulation tissue was obtained in 21 patients, as well as a significant decrease in dimension of wound, with significant shift in type of bacterial from mixed to single and bacterial load reduction. These data are similar to those obtained by Gregor *et al.*,^[4] who, in a systematic review to assess the effectiveness and safety of VAC compared to conventional therapies for complex wounds, observed a significant reduction of the lesion area for those treated with VAC,^[5] without significant adverse effects^[6]. In the present study, no major complications, such as hemorrhage, were observed, which is a well-known complication that may reactivate important initial bleeding similar result also seen in study of Daniel de alacantara jones, use of VAC led to a mean reduction of 29% in wound area^[7, 8].

Conclusion

This is a prospective cohort study of 60 patients, 30 cases (male 20, female 10, mean age 39.5 years) and 30 control (male 23, female 7, mean age 40.9 years) with infected wounds treated using VAC. The use of the VAC led to a mean reduction of 17.93 cm², while with conventional Dressing mean reduction of 8.3 cm², in the wound area ($p < 0.05$).

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