



A COMPARATIVE STUDY BETWEEN VACUUM ASSISTED CLOSURE VERSUS CONVENTIONAL DRESSINGS IN SOFT TISSUE WOUNDS

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KEYWORDS :

INTRODUCTION

Chronic wounds result in significant functional impairment, reduction in quality of life and large financial cost for patients.(1)

Negative pressure wound dressing was introduced in 1997 which has shown to accelerate granulation tissue growth and promote faster healing .(6)

The use of negative pressure wound therapy has been proposed to decrease infection and avoid morbidity of an open wound thereby reducing hospital stay of the patient.(8)

Negative pressure wound therapy is increasingly being used prophylactically on closed incisional wounds to prevent surgical site complications, as well as being used on wounds healing by secondary intention such as chronic or infected wounds.(2)

Objectives

- 1. To determine the rate of reduction of surface area of ulcer between VAC and Conventionally Dressed wounds (Group A and Group B) respectively.
- 2. To quantify the Colony count by culture and sensitivity in order to see the difference of colony growth over the wound beds in patients receiving VAC and Conventional Dressings.

MATERIALS AND METHODS:

- Study Design:** A prospective comparative study was conducted in all patients with soft tissue wounds and who are willing to participate in the study.
- Sample Size :** Sample size was determined using a standard formula for computerised data analysis, resulting in 63 patients in each group. GROUP A – Patients receiving VAC dressings , GROUP B –Patients receiving Conventional dressings, with a total of 126 patients in the study. Calculation was based on a 95% confidence interval and statistical power at 80%
- Study Period :** 1 year. June 2022 To May 2023

- Place Of Study :** Kanachur Institute Of Medical Sciences And Research Centre- Patients presenting in General Surgery OPD/referred cases from other departments of Kanachur Institute of Medical Sciences Deralakatte, Mangalore.

- Ethical Considerations :** The study was conducted following Institutional and Ethical committee clearance .

MATERIALS AND METHOD (contd.)

Patients in GROUP A underwent one or two sharp wound debridements following which Negative Pressure Wound Therapy (VAC) dressing was done, using a wall mounted VAC unit .Initially the ulcer bed was debrided for any slough present , then cleaned with Povidone-Iodine solution and Hydrogen peroxide.

2. A 16F multiporous drain was placed inside a sponge of 2 cms thickness and pore size of >250nanometre which was cut according to the shape of the ulcer, and was placed over the ulcer bed. The area was made airtight by applying transparent impermeable membrane (Opsite) over the ulcer dressing. The suction tube was connected to the wall mounted suction system and the pressure maintained at -125mmHg

Materials And Method (contd):

For the first 48 hours continuous suction was applied(system will be disconnected for few minutes when patient wants to get mobilized), and for next 72 hours suction was applied once in 8 hours. On the 5th day, the wound was re-inspected, and a similar dressing was re-applied when necessary. The exudate was sent for culture and antibiotic sensitivity. The patient was receiving antibiotics as per culture& sensitivity reports. The dressings were repeated every 5th day, until the floor showed healthy granulation tissue, with minimal exudate, with no bacterial growth from the wound.

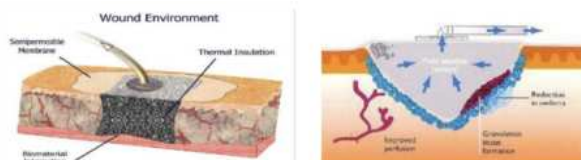
- Patients in GROUP B also underwent sharp debridements as required, but was receiving conventional daily wound dressings with moist gauze. Both groups were compared as per the criteria mentioned as the study end points.

Selection Criteria



- a) Age 18 years and above with soft tissue wounds
- b) Ulcer size of minimum of 4 cms and above
- c) patients who are consenting to participate in the study.
- a) Patients with complete occlusions in Peripheral Vascular System.
- b) Patients with osteomyelitis
- c) Patients bleeding disorders
- d) Patients in septicaemia
- e) Patients with wounds having active pus discharge

The study group had GROUP A with 63 patients who underwent (Vacuum Assisted Closure) application (Negative Pressure Wound Therapy).



- Wound healing rates in these patients were compared with GROUP B of 63 patients with similar wound who underwent conventional dressing with moist gauze.

Results : (Statistical Analysis)

- The data collected was entered in Microsoft Excel and was analysed using SPSS Version 16. Descriptive statistics like proportion, mean and standard deviations were used. An analytical statistical test (paired t-test) was used to assess the mean difference between before and after wound size reduction after VAC dressing , with a P value <0.05 was found to be statistically significant .

Clinical And Demographic Details:

BASLINE CHARACTERISTICS	VACUUM ASSISTED CLOSURE (VAC)- GROUP A	CONVENTIONAL DRESSINGS- GROUP B	P VALUE
AGE IN YEARS(MEAN)	55.85 (35-95)	52.89 (28-70)	0.35
GENDER (%):			
MALE	16 (59.26)	15(55.56)	0.783
FEMALE	11 (40.74)	12 (44.44)	
BMI(KG/m2) mean	22.99	23.26	0.7780
HEMOGLOBIN (g/dl) mean	10.28	10.18	0.8163
ALBUMIN (g/dl)mean	2.77	2.72	0.5287
HbA1C mean	8.74	8.54	0.6525
ULCER SIZE:			0.780
>/= 10CMS	11 (40.74)	10(37.04)	
<10CMS	16(59.26)	17(62.96)	
ULCER AREA (CM2)	70.97	80.44	0.56

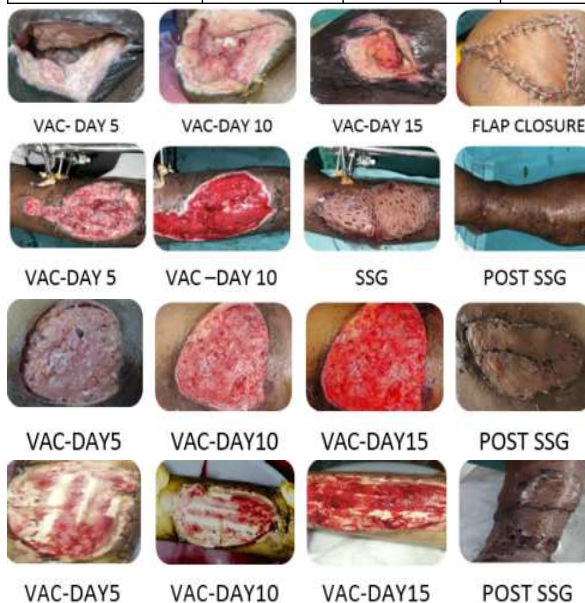
Granulation Parameters Between The Study Groups:

GRANULATION PARAMETERS	(VAC) GROUP A	(CONVENTIONAL DRESSINGS) GROUP B	P VALUE
VISUAL SCORE FOR GRANULATION:			
3	14.52 DAYS	15.04 DAYS	0.5611
4	23.33 DAYS	32.15 DAYS	<0.0001
VAS SCORE FOR PAIN: WEEK 1	8.5(7-9)	8.5(7-10)	0.271
WEEK 3	3 (2-6)	4(2-7)	0.004

GRANULATION TISSUE FORMATION(CM2/DA Y):	2.4(0.79-7.29)	1.7(0.77-5.5)	0.0306
MEDIAN RATE :			
<10CM SIZE:	2.02(0.79-5.2)	1.43(0.77-3.89)	0.0351
>/= 10CMS SIZE:	4.2(2.37-7.29)	2.766(1.54-5.5)	0.3598

Nature Of Growth Found In Wounds Between The Study Group:

NATURE OF GROWTH	VACUUM ASSISTED CLOSURE- GROUP A	CONVENTIONAL DRESSINGS- GROUP B	P VALUE
POLYMICROBIAL	8	22	<0.001
NO GROWTH	12	11	0.783
ESCHERICHIA COLI	1	13	<0.000
GRAM POSITIVE	22	21	0.735
GRAM NEGATIVE	10	23	0.0003
AEROBES	5	6	0.735
FACULTATIVE ANAEROBES	26	27	0.315
ANAEROBES	1	0	0.315



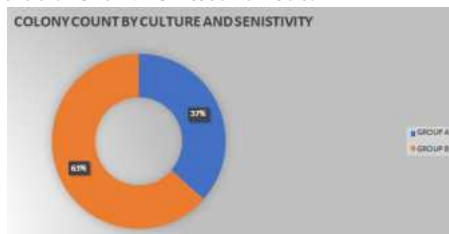
RESULTS :



Rate Of Reduction Of Surface Area Of The Wound (13+/- 2.49cm2) With P<0.05



Antimicrobial Growth On Wound Beds:



DISCUSSION

- The mean time to healing in days was significantly less in VAC group (58.52 vs. 3.85, $P < 0.0001$).
- Mean time to achieve 75%-100% granulation tissue cover was significantly less in VAC group (60.33 vs. 68.15; $P < 0.0001$).
- The rate of reduction in surface area of the wound in patients with VAC was significantly higher with (13+/- 2.49cm²) reduction, and $P < 0.05$.

CONCLUSION

- Despite the modest number of patients used in the study, the results demonstrate the establishment of healthy granulation tissue required less time, decreased rate of local infection of the wound, thereby being able to achieve total wound healing in patients with soft tissue wounds, which in turn reduced the duration of their hospital stay.
- The use of vacuum dressing compared to conventional dressings suggests an advanced treatment modality.

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