

Comparative Study of Efficacy of Modified Vacuum Assisted Closure Dressing Using Gloves Versus Betadine Dressing In Chronic Non Healing Ulcer In Govt Rajaji Hospital, Madurai

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ABSTRACT

Background: Vacuum assisted closure dressing is a recent trend and proven method for faster healing of chronic non healing ulcers. Delayed wound healing is a significant health problem imposes social and financial burdens. Vacuum-assisted closure (VAC) therapy has been developed as an alternative to the standard forms of wound management, which incorporates the use of negative pressure to optimize conditions for wound healing and requires fewer painful dressing changes.

Aim: To compare the efficacy of the modified vacuum assisted closure (VAC) dressing using gloves and available resources in a low resource setting with routine Povidone iodine dressing in wound healing in patients who are admitted in GRH, MADURAI

Objectives: To find out the rate of granulation tissue, pain score, duration of hospital stay ,graft uptake in comparison to povidone iodine dressing. dressings.

Materials and Methods: It is a prospective non-randomized comparative study, a total of 100 patients were taken and divided into two groups with 50 each for conventional povidone iodine dressing and modified vacuum assisted dressing using gloves. Vacuum dressing done with autoclaved gauze, opsite, glove, Ryles tube and creating a vacuum with 50 cc syringe or Romovac. Comparison between the groups made in rate of granulation tissue , graft uptake, pain score ,duration of hospital stay

Results: The number of patients studied was 100 and are randomly divided into study (50) and control group (50).both the study and control group were matched regarding their age ,sex and there was no significant difference between the two groups with respect to age and sex.The average pain score in the range of 0-10 was 3.38 in the vacuum dressing and it was 6.96 in the povidone iodine dressing group. The mean duration of hospital stay in the vacuum group was 27.02 days and in the povidone iodine dressing group was 32.12 and the p value was ($p < 0.000004$) which is highly significant.The mean split skin graft uptake in the vacuum dressing group was 87.6% and in the povidone dressing group is 56.06%. The mean rate of granulation tissue formation in povidone group is 36.21 of total ulcer surface area and in vacuum dressing group is 39.57 and the p value was ($p < 0.0005$) which is highly significant

Conclusion: Modified vacuum assisted closure using gloves proven to be effective then the conventional povidone iodine dressing in non healing ulcers of foot.

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I. Introduction

Negative pressure wound therapy or vacuum assisted closure dressing is a newer non-invasive technique that use controlled negative pressure, using vacuum-assisted closure (VAC) device. It helps to promote wound healing by removing fluid from open chronic wounds, preparing the wound bed for graft or other closure methods by reducing edema and promoting formation of granulation tissue. VAC dressing can be used to treat Chronic non healing ulcers following debridement of infection or amputation, and in reconstructive soft tissue and osseous procedures.

Vacuum assisted closure dressing has been frequently modified with given restrictions in resources available.

II. Aim & Objective

To compare the efficacy of the modified vacuum assisted closure (VAC) dressing using gloves and available resources in a low resource setting with routine Povidine iodine dressing in wound healing in patients who are admitted in GRH, MADURAI

III. Materials And Methods

DESIGN OF THE STUDY: PROSPECTIVE STUDY

STUDY PERIOD : 2018

SAMPLE SIZE : 100

STUDY PLACE : GRH MADURAI

INCLUSION CRITERIA:

- Patients more than 25 years of age
- Diabetic ulcers in the extremities
- Non healing ulcers in the extremities
- Amputation stump ulcer

EXCLUSION CRITERIA

- Malignant wounds
- Wounds with underlying osteomyelitis
- Wounds with sinus or cavity
- Wounds with unstable fracture
- Wounds with loose fragment of bone
- Larger wound surface
- Wounds with Exposed blood vessels
- Patients on anticoagulation therapy

METHOD OF COLLECTION OF DATA

Detailed history

Clinical Examination

Dimensions of the ulcer

Rate of granulation tissue

Duration of hospital stay

METHODOLOGY:

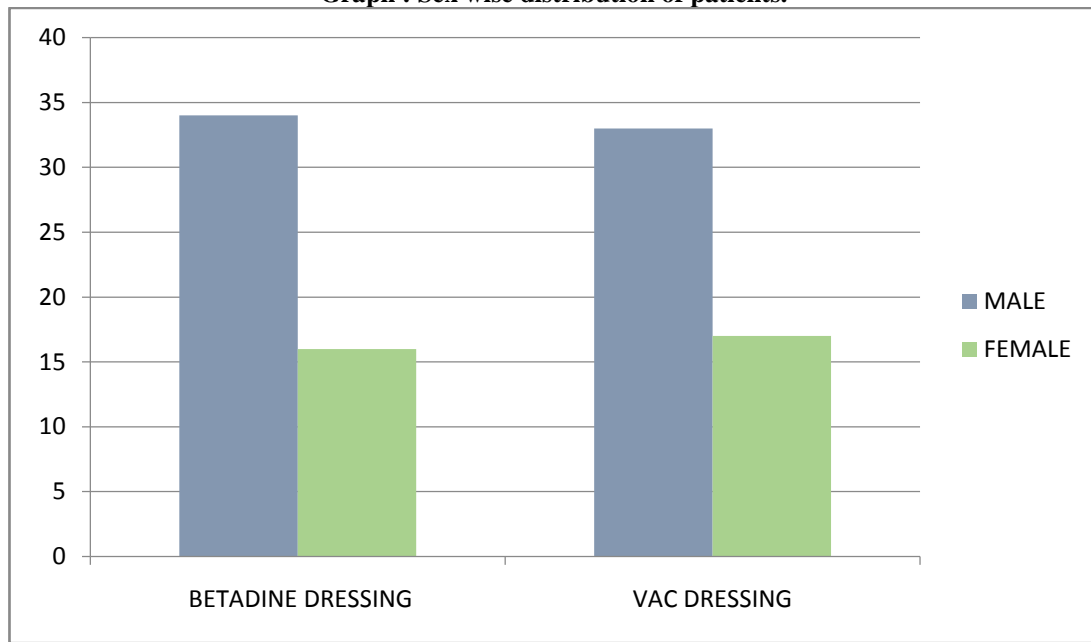
- wound debridement
- The wound base was covered with gauze piece placed in two layers.
- A tube with adequate fenestrations depending on the size of the wound placed in between the two layers of gauze.
- The gauze layer is held in place over the wound by applying thin Opsite.
- An appropriate sized sterile surgical glove is taken and inserted over the wound covering the extremity
- The tube is brought out from the edge of the glove.
- A piece of Opsite is applied covering entire margin of glove circumferentially.
- Exit site of tube through the glove is fashioned like T-tailing using opsite strip to prevent air leakage
- End of the tube connected to Romovac device or 50 cc syringe and suction is applied

Total ulcer surface area measured initially and the reduction in the surface area before grafting measured. Area of granulation tissue covering the ulcer also measured using butter paper. After grafting on the post op day 5 graft uptake was measured in percentage. Total duration of the hospital stay was noted . pain in the each patient was measured using visual analogue scale.

IV. Observations And Results

The 100 patients admitted in our GRH selected for the study were divided into two equal and comparable groups. Patients subjected to modified VAC dressing using gloves were classified under study group and those who underwent conventional povidone iodine wound dressing were classified under control group.

Graph : Sex wise distribution of patients.



	MALE	FEMALE
BETADINE DRESSING	34	16
VAC DRESSING	33	17

TABLE: Age wise distribution of patients

AGE GROUP (yrs)	31-40	41-50	51-60	61-70	71-80
BETADINE	7	11	17	10	5
VAC	7	14	16	8	5
TOTAL	14	25	33	18	10

Mean age of Betadine group is 54.42
 Mean age of VAC DRESSING group is 54.7
 P value is 0.90. Not significant.

GRAPH: Age wise distribution of patients

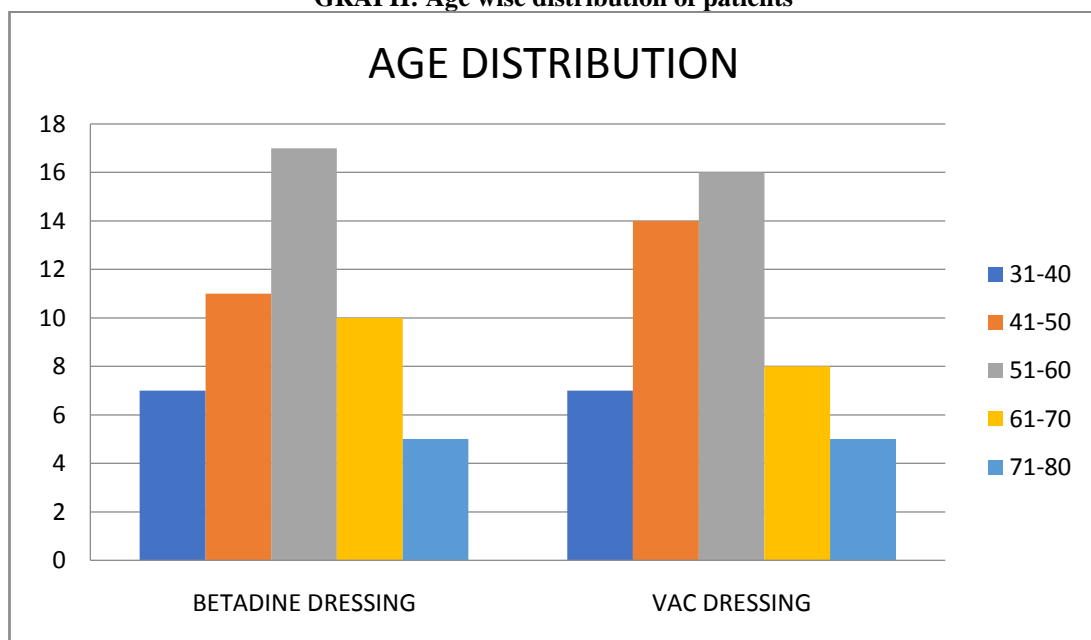


TABLE: ULCER SURFACE AREA

GROUP	NO.OF PTS	MEAN	STD. DEVIATION	t VALUE	p VALUE
BETADINE	50	38.74	5.73	1.82	0.07
VAC DRESSING	50	40.41	2.85		

The mean ulcer area in control group is **38.74+5.73(SD)cm²** and in the study group is **40.41+2.85(SD)cm²**. The ulcer area was measured by using tissue paper.

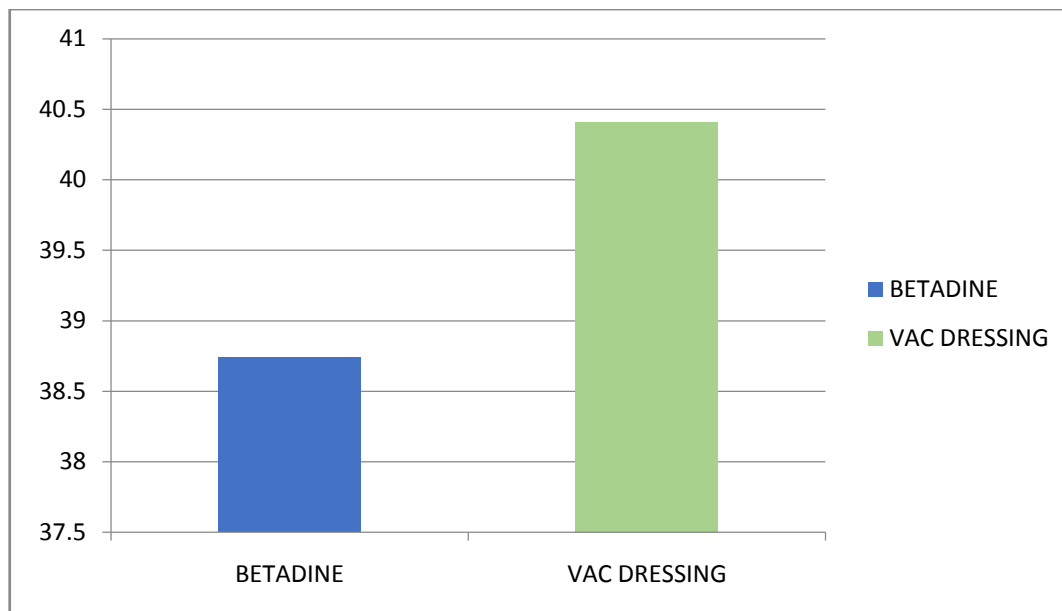
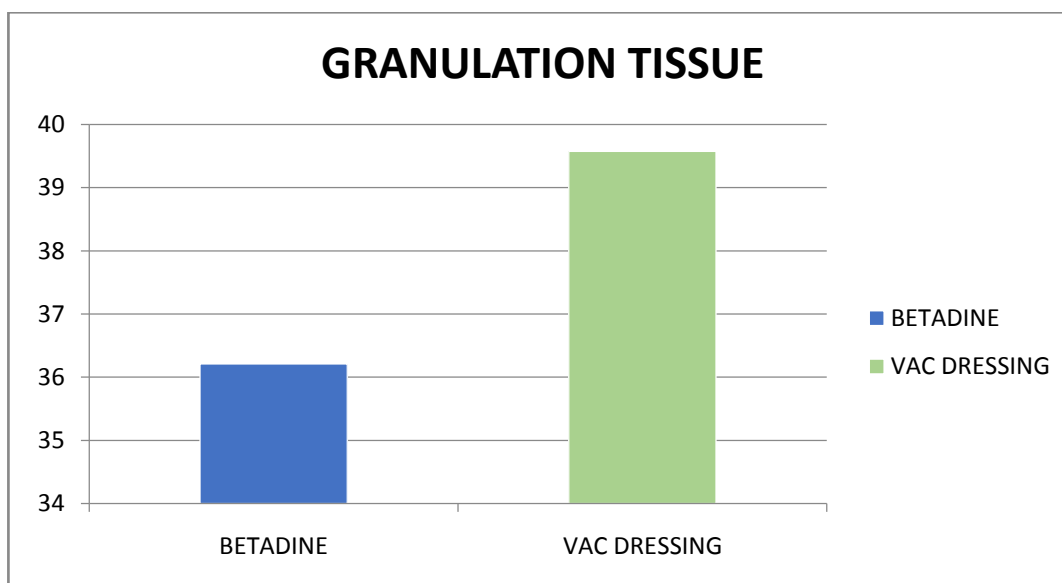


TABLE: RATE OF GRANULATION TISSUE FORMATION

GROUP	NO.	MEAN	STD. DEVIATION	t VALUE	p VALUE	
GRAN TISSUE	BETADINE	50	36.21	5.99	3.58	0.0005
	VAC DRESSING	50	39.57	2.69		

The mean rate of granulation tissue formation in Betadine group is **36.21+5.99(SD)** of total ulcer surface area and in VAC DRESSING is **39.57+2.69(SD)** of total ulcer surface area.

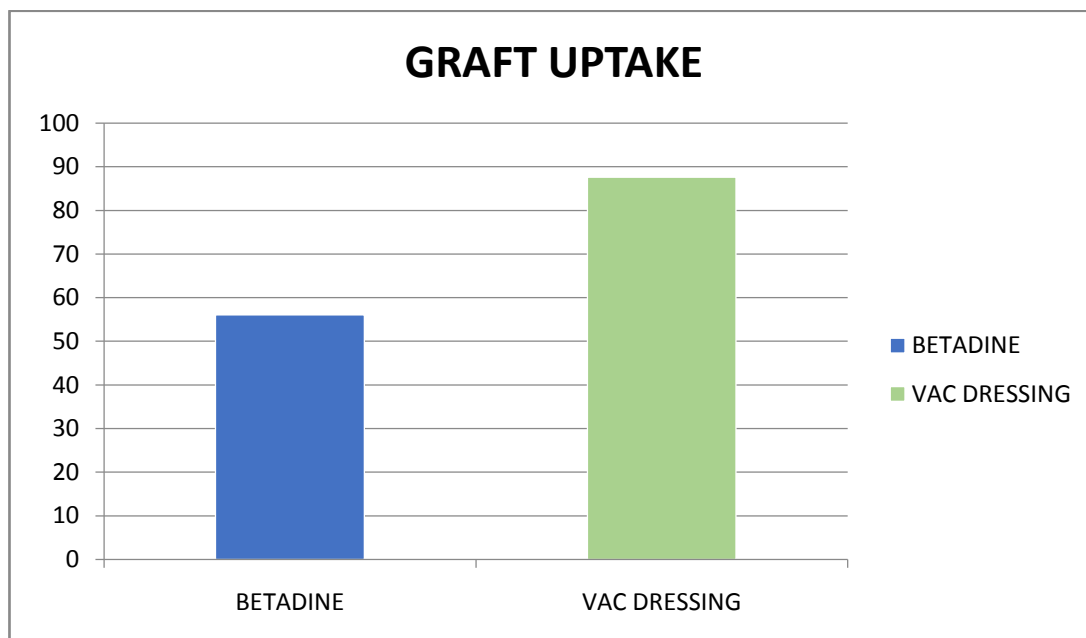


The mean rate of granulation tissue formation in Betadine group is **36.21+5.99(SD)** of total ulcer surface area and in VAC DRESSING is **39.57+2.69(SD)** of total ulcer surface area.

TABLE: GRAFT UPTAKE AS PERCENTAGE OF ULCER SURFACE AREA

GROUP		N	MEAN	SD	t VALUE	p value
SSG	BETADINE	50	56.06	19.05	10.9	0.0000
	VAC DRESSING	50	87.6	6.62		

Assessment of graft uptake was done at the end of POD 5 as percentage of ulcer surface area. The mean graft uptake in the study group is **87.6%** and in the control group is **56.06 %**

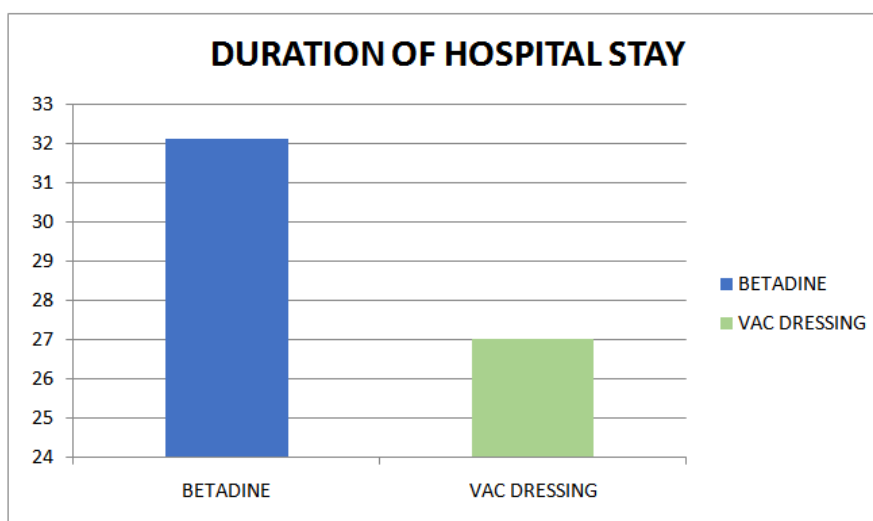


Assessment of graft uptake was done at the end of POD 5 as percentage of ulcer surface area. The mean graft uptake in the study group is **87.6%** and in the control group is **56.06 %**

TABLE: DURATION OF HOSPITAL STAY

GROUP		N	MEAN	STD DEVIATION	t VALUE	p VALUE
NO OF DAYS	BETADINE	50	32.12	6.07	4.87	0.000004
	VAC DRESSING	50	27.02	4.09		

The mean duration of hospital stay in the vacuum group was 27.02 days and in the povidone iodine dressing group was 32.12 and the p value was ($p < 0.000004$) which is highly significant.

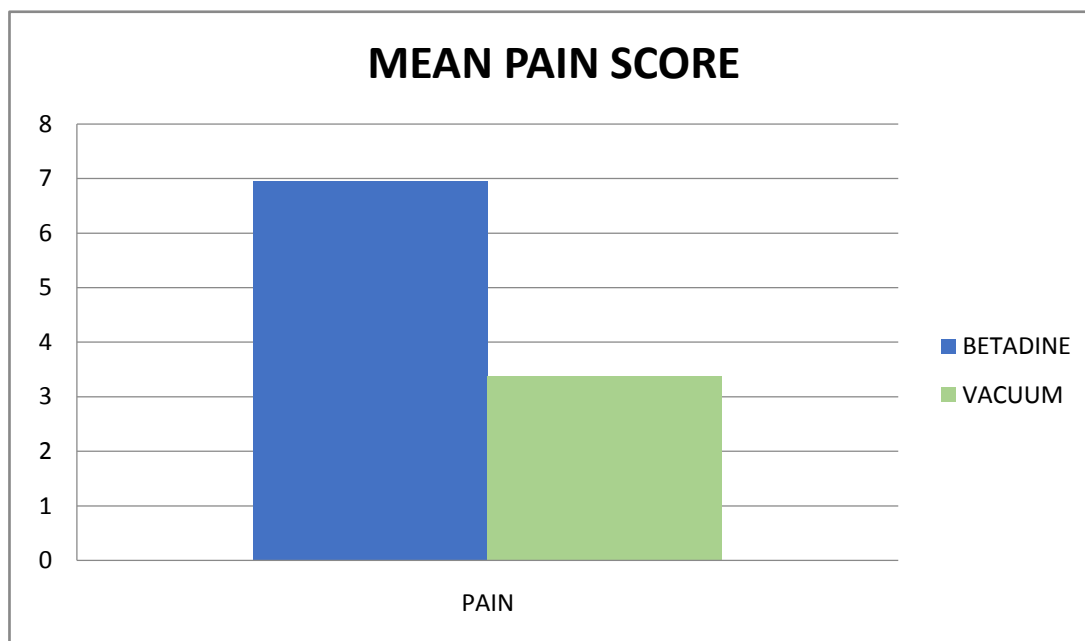


The mean duration of hospital stay in the vacuum group was 27.02 days and in the povidone iodine dressing group was 32.12 and the p value was ($p < 0.000004$) which is highly significant.

PAIN SCORING

Average pain score in the range of 0 to 10 was 6.96 in the conventional betadine dressing and it was 3.38 in the study group. $P < 0.001$ which is significant reduction in the pain score.

PAIN	TEST	CONTROL
MEAN	3.38	6.96
SD	1.24	1.41
P VALUE	<0.001	



Average pain score in the range of 0 to 10 was 6.96 in the conventional betadine dressing and it was 3.38 in the study group. $P < 0.001$ which is significant reduction in the pain score.

The main postoperative parameters noted in the study and control groups:

- Wound size
- Contracture
- Pain
- Infection

All these parameters are less in the study group when compared to the control group.

ANALYSIS OF DATA:

The number of patients studied was 100 and are randomly divided into study (50) and control group (50).both the study and control group were matched regarding their age ,sex and there was no significant difference between the two groups with respect to age and sex.

The average pain score in the range of 0-10 was 3.38 in the vacuum dressing and it was 6.96 in the povidone iodine dressing group.

The mean duration of hospital stay in the vacuum group was 27.02 days and in the povidone iodine dressing group was 32.12 and the p value was ($p < 0.000004$) which is highly significant.

The mean split skin graft uptake in the vacuum dressing group was 87.6% and in the povidone dressing group is 56.06% and the p value showed highly significant difference in split skin graft uptake ($p < 0.0000$).

The mean rate of granulation tissue formation in povidone group is 36.21 of total ulcer surface area and in vacuum dressing group is 39.57 and the p value was ($p < 0.0005$) which is highly significant

V. Conclusion

- Modified VAC dressing significantly reduces the size of ulcer.
- Modified VAC dressing improves the rate of granulation tissue formation.
- Modified VAC dressing improves SSG uptake also.
- Modified VAC dressing reduces the duration of stay at the hospital.
- Patients undergoing Modified VAC dressing feels lesser amount of pain when compared with the patients undergoing conventional wound dressing.
- Modified VAC dressing minimizes the blood loss also.

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