



A PROSPECTIVE STUDY TO EVALUTE ROLE OF NEGATIVE PRESSURE WOUND THERAPY-NPWT (VAC THERAPY) IN WOUND MANAGEMENT

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ABSTRACT

Introduction: Wound management remains one of the most discussed topic in orthopaedics, No one technique has been proved to be Novel and Accepted to all yet. Negative pressure wound therapy, or Vacuum Assisted Closure (VAC) dressing has emerged as a pivotal tool in the management of wounds in orthopedic trauma, offering significant results. **Aim:** To Evaluate role of NPWT (VAC THERAPY) in Orthopaedics Trauma and Wound Management **Materials And Methods-** A total no of 47 patients were included in the study conducted at Index Medical College between Dec 22 to July 24, Patients who had Traumatic, Infective and those having Post operative wound dehiscence were included in the study. Routine Preoperative Investigations CBC, Blood Sugar levels, Culture Sensitivity BT, CT were done. **Result:** This study of Vacuum-Assisted Closure (VAC) dressing in orthopaedics demonstrates significant benefits in infection control, wound size reduction, and favorable final outcomes. VAC therapy promotes wound healing by providing a controlled, moist environment and enhancing tissue perfusion. This method has proven effective in reducing bacterial colonization, which plays a critical role in infection control. Additionally, the continuous negative pressure aids in wound contraction, contributing to a marked decrease in wound size over time **Conclusion:** Our Study Concluded that, Vac Therapy Provides Sterile Environment, which enhances Wound healing by Decreasing the infective load, granulation formation and wound contracture, Additional definitive management of wounds through skin grafts or secondary closure is also seen.

KEYWORDS : VAC, NPWT, Sub-Atmospheric Pressure, DHAM- Dehydrated amniotic membrane

INTRODUCTION-

Wound management remains one of the most discussed topic in orthopaedics, No one technique has been proved to be Novel and Accepted to all .High energy musculoskeletal wounds present a challenge to treating surgeons in terms of reconstruction, healing, and covering. Significant soft tissue abnormalities brought on by these open musculoskeletal injuries cause wound healing to be delayed. Treatment for these soft tissue injuries is a challenge for the surgeon, even with advancements in methods to speed wound healing, such as various dressings, hyperbaric oxygen therapy, various antiseptic agents, skin transplants, or local.

Negative pressure wound therapy, or Vacuum Assisted Closure (VAC) dressing has emerged as a pivotal tool in the management of wounds in orthopedic trauma, offering significant results. Over the past 20 years, vacuum aided closure (VAC) dressing therapy—also referred to as negative pressure wound therapy or micro deformational wound therapy—has revolutionized wound care. Fleischmann¹ et al. originally disclosed this technique in 1993 . One type of non-invasive treatment is VAC dressing therapy. It is a therapeutic method that uses a vacuum dressing to improve the healing of first and second degree burns as well as to encourage healing in acute or chronic (nonhealing, traumatic) wounds. It uses a sealed wound dressing attached to a vacuum pump to apply sub-atmospheric pressure to the local wound environment under regulated conditions. It removes serous fluid or blood from the surgical site via vacuum-assisted drainage. It controls blood flow and encourages a dry surgical field, furthermore provides oxygen and nourishment to the wound to aid in its recovery.

More recently, vacuum-assisted closure (VAC) dressing therapy has been utilized to treat traumatic and non-healing wounds. It was first created in the early 1990s to treat big, persistently infected wounds that were impossible to seal in

severely disabled patients.

Aim

To Evaluate role of NPWT (VAC THERAPY) in Orthopaedics Trauma and Wound Management

MATERIALS AND METHODS

A total no of 47 patients were included in the study conducted at Index Medical College between Dec 22 to July 24, Patients who had Traumatic, Infective and those having Post operative wound dehiscence were included in the study. Routine Preoperative Investigations CBC, Blood Sugar levels, Culture Sensitivity BT, CT were done

Results Were Assessed On Basis Of

1. Control of Infection
2. Post VAC wound Size and no of Dressings
3. □Final Outcome of Wound.

Inclusion Criteria

1. Primary Compound Wounds (size > 3 *3cm)
2. Infected Wounds
3. □Impending Wound and Suture Wound dehiscence
4. □Pt with Upper and Lower limb trauma only

Exclusion Criteria:

1. Presence of active bleeding wounds.
2. Allergies to adhesive drapes
2. Pain or discomfort experienced during initial suction application.
3. Skin irritation due to improperly sized foam.
4. Severe or developing skin necrosis

Patients were evaluated for surgical fitness by an anaesthetist. Consent for study participation was obtained prior to the application of NPWT. The Study was conducted at Index Medical College, Indore between January 23 to May 24.

Materials Used-



1. Sterile sponge



2. Romo Vac Set®



3. Ioban

4. Adhesive tape

5. Suction Machine

Procedure-

Patient taken in operating room , scrubbing done with 7.5percent betadine surgical scrub, wash given with 3litres of normal saline, draping done . Debridement of the wound done with curette until fresh bleeding, all the necrotic and dead tissue including tendons, muscle fibres , skin edges removed and final wash given with betadine and 6 litres of normal saline. Size of the wound measured and appropriate size of autoclaved polyurethane foam was prepared for vac dressing, drain pipe of Romovac was introduced in the foam and the sieve ending of pipe was placed in side foam this was applied at the wound site covering full edges of wound after that the site was covered with Ioban and clinched drape to completely pack the site and other end of the pipe was connected to vaccum machine.

On the third day, the dressing is often changed. The negative pressure mode, which ranges from 50 to 125 mmHg, can be intermittent or continuous. Five minutes of on and two minutes of off make up the intermittent mode cycle . It is possible to maintain a low pressure setting (50-75 mmHg), especially for chronic wounds that cause discomfort. Greater pressures (150 mmHg or more) are applied to exhudative wounds and big cavities².

Guidelines³ for use of the VAC.

Indication	Guidelines		
Empty Cell	Type of wound	Cycle setting (following initial 48 h continuous period)	Dressing change interval
Ulcers	Chronic ulcer (diabetic, dysvascular)	Continuous, 50-75 mmHg	48 h (12 h with active infection)
	Pressure ulcer	Intermittent, 125-175 mmHg	As above
Acute wounds	Acute, sub-acute, traumatic and dehised wounds	Intermittent, 125-175 mmHg	48 h (12 h with active infection)

Flaps, grafts and burns	Meshed graft	Continuous, 75-125 mmhg	None. Remove dressing after 3-5 days
	Fresh flap	Continuous 125 mmHg	72 h (12 h with active infection)
	Compromised flap	Continuous 125 mmHg	48 h (12 h with active infection)

Contra-indications

Malignancy with the wound

Untreated osteomyelitis within the wound

Non-enteric and unexplored fistula

Necrotic tissue with eschar present (debride first)

Precautions

Active bleeding, difficult wound haemostasis, anticoagulant therapy

Close proximity to blood vessels/organs (ensure cover with tissue or protective barrier)

Care with irradiated or sutured blood vessels or organs

RESULT

A total no of 28 cases are being discussed in the result, in particular to no of dressings, infection control, wound size and final outcome.

Case Series

1.



At Time of Presentation

During NPWT-VAC

After Removal

2.



Wound dehiscence Treated by NPWT-VAC (Operated ORIF Proximal Tibia)

3



Case of Traumatic

Post Procedure



Group 1 Primary Open Wound (Table-1) *Control of infection seen in majority of cases

No Of patients	No of dressings	Post dressing wound size	Final outcome
1.	2	Decreased	Primary closure
2.	4	Decreased	Primary closure
3.	2	Decreased	Primary closure
4.	2	No change	SSG
5.	2	Decreased	SSG
6.	3	Decreased	Primary closure
7.	3	No change	Rotation flap
8.	2	Decreased	SSG
9.	1	Decreased	SSG
10.	1	Decreased	Primary closure
11.	2	No change	SSG
12.	2	Decreased	Flap
13.	3	No change	Flap
14.	1	Decreased	Primary closure

Group 2 (Chronic Non Healing Wounds, Impending Suture Dehiscence & Others)

***Control of infection seen in majority of cases (Table-2)**

	No Of patients	No of dressings	Post dressing wound size	Final outcome
Chronic non healing wounds	1.	2	Decreased	Conventional dressing
	2.	4	Decreased	Secondary healing
	3.	2	Decreased	Secondary healing
	4.	2	Decreased	SSG
	5.	2	Decreased	SSG
	6.	3	Decreased	Secondary healing

Impending suture and wound dehiscence	7.	3	No change	Conventional dressing
	8.	2	Decreased	Secondary healing
	9.	1	Decreased	Conventional dressing
	10.	1	Decreased	DHAM & Secondary healing
	11.	2	No change	Secondary healing
	12.	2	Decreased	Conventional dressing
others	13.	3	No change	Flap
	14.	1	Decreased	Primary closure

CONCLUSION^{6,7}

This study of Vacuum-Assisted Closure (VAC) dressing in orthopaedics demonstrates significant benefits in infection control, wound size reduction, and favourable final outcomes. VAC therapy promotes wound healing by providing a controlled, moist environment and enhancing tissue perfusion. This method has proven effective in reducing bacterial colonization, which plays a critical role in infection control. Additionally, the continuous negative pressure aids in wound contraction, contributing to a marked decrease in wound size over time. Orthopaedic wounds, especially those related to fractures and post-surgical complications, show faster recovery when VAC is used compared to traditional methods. The final outcomes, including wound closure, skin graft success, and overall healing, are generally satisfactory, with fewer complications and better patient outcomes. Therefore, VAC dressing serves as a valuable adjunct in managing complex orthopaedic wounds, offering a comprehensive approach to enhancing healing while minimizing infection risks.

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