

# Role of Negative Pressure Wound Therapy in Healing of Diabetic Foot Ulcers

## VAC THERAPY FOR DIABETES FOOT ULCERS

There is a definite role for VAC therapy for diabetes foot ulcers. However, the treatment regime for diabetes wounds is different from that following trauma surgery and surgery for musculoskeletal oncology. A more intensive programme is required for diabetes wounds.<sup>[1,2]</sup>

### REQUIREMENTS FOR VAC THERAPY

The author has seen many instances where VAC therapy has been applied for diabetes wounds by surgeons without much success. This is due to failure to understand important requirements which must be met before VAC therapy can be applied.<sup>[1,2]</sup> These requirements are:

1. Radical debridement and excision of all infected and devitalised tissues must first be done. VAC dressing cannot be applied over infected or necrotic tissues.
2. The first application is best done in the operating room after the radical debridement is done by a registrar or medical officer who has been trained in the application of VAC dressings.
3. Subsequent change of dressings in the ward must be done by a medical officer or a staff nurse who has been trained for VAC therapy.

Training can be provided by an experienced staff nurse on VAC dressing working with the commercial company providing the VAC dressing. The medical officer or staff nurse in the ward in charge of VAC dressing can call upon this experienced personnel in case of any difficulty faced in the application of VAC dressings.

### BLEEDING ISSUE

Doctors should note that haemostasis must first be secured before the application. Following debridement, adequate haemostasis must be performed and the wound thoroughly irrigated with normal saline using jet lavage.

1. If despite attempted haemostasis and jet lavage, generalised copious oozing still occur from the

wound, it would be wise to apply Kalstostat dressing and delay the application for one day. The VAC dressing is then applied the following day with only half the recommended negative pressure i.e. 75mm Hg and using intermittent mode of suction as an added precaution.

The author has seen one case where the patient following VAC application has gone into hypovolemic shock. The author recommends that following VAC application, it is wise to leave post-operative instructions - the surgeon ordering the VAC must be informed if the drainage from the VAC bottle is more than 200ml.

2. In cases where haemostasis is good following debridement, the normal 125mm Hg can be applied in the operating theatre.

### INFECTION ISSUE

The author has seen many cases complicated by copious discharge of pus from the wound. It must be emphasised that VAC dressing cannot be used in the presence of overt infection.

As a precaution, VAC dressing must be changed every 2 days. It must not be left for 5 days or a week which is often done for VAC therapy over trauma wounds or other wounds.

After each VAC change, the wound must be meticulously inspected and smelt for infections. Local debridement must be added to excise any necrotic wound edge or any slough that may appear in the wound. This will promote the early formation of healthy tissue granulation.

### NUTRITION FOR WOUND HEALING

It is also important to check that the Haemoglobin level post-debridement must be above 10mg to ensure that enough oxygen is delivered to the wound for good wound healing.

The level of albumin must also be maintained above 32mg, another important pre-requisite of wound healing.

## DURATION OF VAC THERAPY

Whilst VAC therapy has often been quoted for total reduction of wound size (which will take a very long time), the author would like to recommend using it for partial wound size reduction only. He recommends that VAC therapy be used for preparation of the wound. Once healthy granulation tissue has been promoted and culture of the wound is negative, split skin grafting is then performed. Usually, 40-60% reduction in wound size is sufficient to achieve this. This will require about 10-16 changes of VAC dressing and about 2-3 weeks time.<sup>[1,2]</sup>

## OTHER BENEFITS OF VAC

The author has found VAC therapy to be particularly useful for the following:<sup>[1,2]</sup>

- Diabetic wounds which after debridement show exposed bone, tendon, joint capsule or fascia. VAC therapy can promote the production of granulation tissue over bone, tendon, capsule or fascia. However, this takes a much longer time.

- Large wounds after debridement for necrotising fasciitis.
- Ray amputation wounds.

**Aziz Nather**

*Department of Orthopaedic Surgery,  
National University Hospital, 1E, NUHS Tower Block,  
Level 11, Singapore - 119 228, Singapore,  
E-mail: dosnathe@nus.edu.sg*

## REFERENCES

1. Nather A, Chionh SB, Han YY, Chan PL, Nambiar A. Effectiveness of Vacuum-assisted Closure (VAC) Therapy in the Healing of Chronic Diabetic Foot Ulcers. *Ann Acad Med Singapore* 2010; 39:353-8.
2. Nather A., Ng YH, Wong KL, Joshi AS. Effectiveness of bridge V.A.C. dressings in the treatment of diabetic foot ulcers. *Diabetic Foot Ankle* 2011;2:5983.

Access this article online	
Quick Response Code:	Website: <a href="http://www.jstcr.org">www.jstcr.org</a>
	DOI: 10.4103/2006-8808.78463