

## CASE REPORT

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### VACUUM ASSISTED CLOSURE IN DIABETIC FOOT MANAGEMENT

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**ABSTRACT:** Comparison of vacuum assisted closure vs conventional dressing in management of diabetic foot patients. 30 patients were taken in that 15 underwent vacuum therapy and remaining 15 underwent conventional dressing. They were analysed by the development of granulation tissue and wound healing. The study showed Vac therapy is the best modality for management of diabetic foot patients.

**KEYWORDS:** Diabetic foot, vacuum assisted closure.

**INTRODUCTION:** India is the diabetic capital. One of the commonest complications of diabetes is soft tissue infection of the extremities especially the foot. Diabetic foot is the collective term for a wide range of infections of the foot. Diabetic foot accounts for significant morbidity.<sup>(1)</sup> It requires prolonged medical treatment and repeated surgical intervention in the form of debridement and replacement of tissue loss, vacuum assisted closure is an effective method of dressing that acts by reducing tissue edema, improving granulation tissue & vascularity.<sup>(2)</sup> It significantly reduces wound healing time. We present our experience with 15 diabetic foot patients who were managed by vacuum assisted closure.<sup>(3)</sup>

**AIM & OBJECTIVES:** to demonstrate the efficacy of vacuum assisted closure in diabetic foot ulcer over conventional dressing.<sup>(4)</sup>

**MATERIALS & METHODS:** 30 patients with diabetic foot ulcer (wagners class) were selected for the study. 15 were randomly assigned to undergo vacuum assisted closure 15 received conventional dressing with betadine and saline gauze.<sup>(5)</sup> Time taken for granulation, duration of hospital stay, need for tissue replacement etc. were analyzed & compared.<sup>(6)</sup>

**INCLUSION CATERIA:** Patients with diabetic foot infections above 18years of age.

#### EXCLUSION CATERIA:

1. Patients with previous h/o of peripheral arterial disease or previous surgeries for arterial occlusive disease.
2. Patients with necrotizing fasciitis and severe sepsis, previous amputations.
3. Patients with obvious clinical signs of vascular insufficiency or ischaemia including absent peripheral pulses.
4. Patients in renal failure or h/o of poor compliance with medical treatment.

Conventional dressing patients underwent dressing everyday with beta dine and saline gauze. Vacuum dressing patients underwent dressing every 3rd day, suction have to be done every 6th hour. Vacuum assisted closure system unit was programmed to deliver controlled negative pressure up to

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125m/hg. Both the groups were followed for the development of granulation tissue and healing process.

Depth and size of the wound were inspected and recorded before and every three days during the study period. Types of diabetes mellitus and state of its control, duration of ulcer, wound location and frequency of underlying disease were evaluated for all the study patients. Depth of ulcers was measured by means of vernier caliper in the biggest vertical diameter of the ulcers and improvement of ulcer defined according to wagner scale.

**RESULTS:** Improvement of the wound in the form of reducing the diameter and depth and increasing proliferation of granulation tissue was significant in VAC group. Satisfaction of patients in the VAC group was evaluated as no amputation was done in this group. the average time taken for granulation was low (-days) in the vacuum group compared to conventional dressing which was statistically (not) significant.<sup>(7)</sup> Wagner score was reduced in both the study groups, although this decrement was not significant in conventional dressing group. We performed the wagner score for the study patients before and after the treatment. Mean analysis of wagner score showed that both the study groups, it was decreased although decrement was not significant in conventional group.

Evaluation of formation of granulation tissue showed that 70% and 50%of the study patients in VAC group and conventional dressing group. Had the formation of granulation tissue during the two weeks of treatment. All the patients in the VAC group were satisfied with their therapy procedure and its results, whereas 12 patients in the conventional group were not satisfied only three were satisfied. Due to consideration of major/minor amputation as final results of the present intervention, significant intervention was seen. No patients in VAC therapy underwent minor/major amputations, 14 were cured completely. In conventional dressing group 12 patients went for amputations and three were completely cured.

Discussion: diabetic ulcer of the foot is a cause of significant morbidity in diabetic patients. Ulcer is often the starting point for severe progressive soft tissue infection which may lead to amputation. Conventional management of diabetic foot comprises of repeated wound debridement, regular dressing and replacement of tissue loss.<sup>(8)</sup> Vacuum assisted closure is a new method of dressing which acts in multiple ways which facilitate rapid wound healing:

1. Reduces tissue & wound edema.
2. Improves vascularity.
3. Removes debris effectively.<sup>(9)</sup>

Vacuum dressing is done by placing a foam sponge on the top of the ulcer with continuous or intermittent vacuum being applied on the top of the foam. The entire foam dressing has to be airtight for vacuum to be effective.<sup>(10)</sup> The vacuum dressing is changed once in 3 days for inspection of the wound and removal of necrotic tissue when necessary. Antibiotic are given based on culture sensitivity. In our experience vacuum dressing significantly reduced time to granulation and the area of ulcer requiring tissue replacement in the form of graft or flap was also reduced.<sup>(11)</sup> The complications associated with vacuum dressing was spread of osteomyelitis in one case.<sup>(12)</sup>

Vacuum assisted closure assists in wound closure by applying negative pressure to the surface and margins of the wound. The negative pressure therapy is applied to a special foam dressing cut to the dimensions of the wound and positioned in the wound cavity. The continuous negative pressure is very effective in removing exudate from the wound.

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Negative pressure promotes wound contraction to cover the defect and may trigger intracellular signaling that increases cellular proliferation.

VAC therapy optimizes blood flow, decreases edema and aspirates accumulated fluid, thereby facilitating bacterial clearance. Our study showed size, depth and wagner class in VAC dressing were reduced significantly compared to conventional dressing. About 70% and 50% of VAC and conventional dressing groups had granulation tissue.

In the VAC group, the mean changes in the size of the ulcer were three weeks lesser than conventional group. The VAC therapy reduced the need for hospitalization and duration of stay. Although the number of patients in this study was limited the results obtained from this study and satisfaction of the patients allowed us to conclude that VAC is suitable treatment modality for diabetic foot patients.

**CONCLUSION:** Comparison of vacuum dressing vs conventional dressing in diabetic foot patients. 30 patients were taken in that 15 underwent vacuum dressing and remaining 15 underwent conventional dressing. Patients who underwent vacuum dressing took less time for developing granulation tissue. Vacuum assisted closure is an effective method of management of diabetic foot ulcers and it significantly reduces healing time and the area that needs tissue replacement.<sup>(13)</sup> The result obtained from the study showed VAC therapy is the suitable treatment modality for management of diabetic foot patients.

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**Figure 1**

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