

The use of a new foam filler material for negative pressure wound therapy (NPWT) in the management of complex diabetic lower limb ulceration

Dr Samer Bondokji, Podiatrist and Wound Care Specialist, International Medical Centre, Jeddah, Kingdom of Saudi Arabia

Introduction

The three patients presented are part of a multi-centre study using a new NPWT device VISTA and newly introduced foam dressing to access the efficacy of the dressing as part of the treatment of diabetic foot wounds.

Patient Details

The first patient a 42 year old Type I diabetic male that presented to us from another institution after he was scheduled for a below knee amputation of his right leg for wet gangrene of the right foot with partial necrosis of the lateral aspect. We did an incision and drainage and excision of all devitalised and necrotic tissue along with partial amputation of the 4th and 5th metatarsals. A Peripherally inserted central catheter (PICC) line was used to deliver IV antibiotics as per the intra operative tissue cultures. Post operatively the use of NPWT was discussed with the patient and following consent we applied the foam dressing and connected it to the VISTA. After 7 dressing changes NPWT was discontinued and a split thickness skin graft applied to the now granular and superficial wound and the patient gradually returned to his normal daily activities.

The second patient a 54 year old type II diabetic male who presented to us for a second opinion after the treatment of his right foot ulcer at another institution was unsatisfactory to him. He initially had an ulcer at the base of his hallux plantarly but that later developed in to a plantar abscess, necrosis and full thickness dry gangrene of the 4th and 5th toes. The patient was taken to the OR for incision and drainage of the abscess along with debridement of all devitalized tissue and amputation of the 4th and 5th toes. Following surgery the use of NPWT was explained to the patient and consented obtained. The foam dressing was applied to the wound bed and connected to the VISTA device. The patient received IV antibiotics through a PICC line as per the intra operative tissue cultures. NPWT was discontinued after 5 dressing changes and traditional dressings commenced the wound healed completely 4 weeks later and the patient returned to his job and his normal daily activities.

The third patient a 75 year old type II diabetic male who had an injury to his left leg while in Indonesia. The wound was treated by primary closure at a hospital in Jakarta but developed an infection after the patient's return home. He underwent several incision and drainage procedures and was admitted to the hospital for a week for IV antibiotics. He presented to us with a deep cavernous wound along the lateral border of the left tibia. Osteomyelitis was ruled out by MRI. NPWT was explained to him and consent obtained, the foam dressing was applied to the wound bed and connected to the VISTA machine. NPWT was discontinued after 4 dressing changes and traditional dressings commenced the wound healed completely and the patient returned to his pre injury activity.

Conclusion

Diabetic foot wounds are a challenge to manage for the most seasoned of clinicians and closing a large defect in a diabetic foot adds to those challenges, but this devise and dressing offers rapid growth of granular tissue with elimination of exudate and a rapid filling of dead space and a acceleration of wound closure. This devise and dressing allows the clinician to manage wounds with large gaps and high risk for infection in a safe and reliable manner. It is very well tolerated by patients and dressing changes can be done efficiently by the doctor or nurse and in a reasonable amount of time.

* After discontinuation of NPWT the patient had traditional dressings for another 4 weeks on biweekly basis until full closure.

** Manufacturer's instructions for the foam dressing to be changed every 48 hours.

*** The patient had three dressing changes on biweekly basis after termination of NPWT until full epithelialisation was achieved.

Wounds

The first two wounds were post debridement with a considerable loss of tissue. The patients had adequate blood supply but prevention of infection was always a concern along with exudate management. The third wound was deep and sloughy and very close to bone.

Treatment

All patients were managed as out patients and received dressing changes every four days on average. The foam dressing was secured with the provided drapes but we added Opsite strips on the edges to prevent leakage. We used a wound contact layer to prevent bleeding or injury to granulation tissue when the foam was removed during dressing changes and negative pressure was set at -80mm Hg. in a constant mode.

Benefits

Dressing change is every 4 days on average rather than daily dressing**

Exudate management

Rapid growth of granulation tissue

Minimal pain during dressing changes

The machine is quiet and portable with a long battery life.

Results

| | Filler | Days NPWT | Dressing changes | Pre-NPWT wound dimensions (cm) (length x width x depth x) | Post-NPWT wound dimensions (cm) (length x width x depth x) |
|-----------|--------|-----------|------------------|---|--|
| Patient 1 | Foam | 26 | 7 | 27.5 x 13 x 1 | 19 x 7 x 2 |
| Patient 2 | Foam | 20 | 5 | 19 x 4.5 x 1.2 | 0 x 0 x 0* |
| Patient 3 | Foam | 13 | 4 | 3 x 3 x 1 | 2 x 1.5 x 0** |

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Patient 1



Foot after debridement and partial amputation of 4th and 5th metatarsals



Sixth dressing change- plantar view



Sixth dressing change- lateral view



Sixth dressing change- medial view



Post-grafting - lateral view

Patient 2



During debridement



NPWT First dressing change - lateral view



Wound healed - 4 weeks after discontinuation of NPWT

Patient 3



Wounds on presentation pre-NPWT



Complete epithelialisation with conventional dressings once NPWT was discontinued***