

A case report of successful limb salvage with a new NPWT system

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Introduction

Sequelae of diabetes in the lower extremity continue to become an increased public health concern as the incidence of diabetes and diabetes related hospital admissions continue to rise. Diabetic foot ulcers, specifically, are the most common reason for admission as well as more than half of non traumatic limb amputations in the diabetic population. Diabetic foot ulcers continue to be a tremendous financial and medical burden on the health system which cost as high as \$45000 per patient. The need for adequate preventive care cannot be overemphasized. However, in the current health care scenario, effective as well as economical treatment adjuncts remain necessary when the ulcers appear.

Case history

We present a case report of successful treatment of a limb threatening infection with a new Negative Pressure Wound Therapy (NPWT) system utilizing a gauze-based filler dressing*. W.B. was a 38 year-old male patient with a history of poorly controlled type II Diabetes Mellitus (DM), and metabolic syndrome who was admitted to our facility with a diabetic foot infection to the right foot on 12/30/2008. At time of admission, the patient complained of "feeling ill for the past few days". On physical exam he was found to have a 6.0cm x 9.0cm ulcer on the medial-plantar aspect of Right foot with seropurulent drainage and cellulitis.

The wound did not probe to bone and there was no sinus tracking. Patient had palpable DP and PT arterial pulses bilaterally, but was found to be completely neuropathic on the entire foot as tested with Semmes Weinstein monofilament. X-rays were negative for osteomyelitis or gas gangrene in the soft tissues. MRI was consistent with deep space abscess which extended from plantar medial midfoot to sub metatarsal 1 area and central aspect of distal forefoot. Wound cultures were taken.

Patient was placed on Zosyn 3.375mg IV q6 hours and Vancomycin 1g IV q12. Patient was taken to operating room for incision and debridement on 1/1/09. Patient was left with two incisions; one on the dorsal aspect of the 1st interspace

which extended dorso-proximally to the midfoot, and one on the medial aspect of the foot. The wound was graded at III. Post operative dressing consisted of wet to moist saline gauze dressing changed twice a day. Infectious diseases service was consulted who advised changing to Ancef 2g IV q8 hours for MSSA septicemia.

On 1/5/09 patient was taken for second incision and debridement. On 1/7/09, patient was diagnosed with an acute deep vein thrombosis (DVT) to the Right leg and heparin and coumadin protocol was initiated immediately. Definitive cultures from operating room showed MSSA and Streptococcus Multiphilia. Antibiotic therapy was changed to Rocephin 2g IV every 24 hours and oral Levaquin 500mg every day. Consulting vascular surgeon at this point advised against an amputation as patient did not show any clinical signs of PAD or Osteomyelitis. He advised instead on continued wound care as limb salvage was still possible.

On 1/11/09 patient was taken for another incision and debridement where severe liquefaction necrosis of soft tissue was found. On 1/16/09 Vascular examined patient and stated that as wounds were not responding to standard wound care, a below knee amputation was an option.

At this point, we were faced with either proceeding with a below knee amputation or further attempts at limb salvage.

It was decided to initiate the patient on NPWT with a gauze-based filler dressing*. Dressings were changed every two days. Patient was discharged to rehabilitation facility on 1/25/09, to continue receiving the NPWT system and follow up in Vascular Clinic every Monday.

Outcome

At each week follow up the wounds decreased steadily and remained free of infection. At 4 weeks the wounds were small and superficial and the NPWT system was discontinued in exchange for wet to moist dressings. Wounds went on to heal completely and remain closed at current day. Patient is now fully weight bearing without restrictions bilaterally.

The NPWT system utilizing a gauze-based filler dressing* proved to be an excellent limb salvage modality for wound closure and limb salvage, and at least as effective, if not more effective than other NPWT systems that are commercially available.



Cost savings

The cost of treatment with NPWT was \$1,969.50 compared with a representative estimate of the cost of a below-knee amputation of \$91,106¹, (including the initial hospitalization, all rehospitalizations for acute care related to the limb injury, inpatient rehabilitation, outpatient doctor visits, outpatient physical and occupational therapy, and purchase and maintenance of prosthetic devices). This estimated cost does not take into account the cost to the patient in terms of quality of life, lost income, life-altering pain and the daily ramifications of the loss of a lower leg that were saved due to successful limb salvage in this case.

Cost of treatment with NPWT			
	Units	Cost per unit	Total cost
Number of dressing kits	10 x	\$30.20	\$301.95
Number of canisters	10 x	\$24.26	\$242.55
Rental days	25 x	\$57.00	\$1,425.00
Total			\$1,969.50

Estimated cost of amputation	
Total	\$91,106.00

Estimated cost savings	
Total	\$89,136.50

References

1. Ellen J. MacKenzie, PhD et al., (2007). Health-Care Costs Associated with Amputation or Reconstruction of a Limb-Threatening Injury. The Journal of Bone and Joint Surgery (American). 2007;89:1685-1692.

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