



## Preventing Lower Extremity Amputation due to a Complicated Non-healing Diabetic Heel Ulcer

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### Abstract

Foot ulcers precede approximately 85% of lower extremity amputations (LEA) in patients with diabetes. There are approximately 90,000 major amputations due to the complications of diabetes each year in the United States. The 3 year mortality rate after diabetic LEA is between 35 & 50%. Early detection and appropriate treatment of these ulcers may prevent up to 85% of these LEAs.

This case demonstrates how LEA was prevented in a diabetic patient with a complicated chronic heel ulcer, which was resistant to past treatments. The ulcer was healed utilizing a focused multidisciplinary approach.

### History and Physical Exam

This is a 54 year old insulin dependent diabetic with a history of a left heel ulcer and osteomyelitis of the calcaneus for approximately one year. He had undergone various forms of treatments including multiple surgical debridements, IV antibiotics, wound VAC, off-loading, and multiple local wound treatments including Regranex. Despite all of these modes of treatment, the ulcer showed no signs of healing and the patient was at risk of requiring a major amputation. The patient denied having any pain, fever, or chills. He did note excessive drainage requiring at least 3 dressing changes per day.

Past medical history was positive for hypertension, dyslipidemia, and neuropathy.

Past surgical history was positive for multiple surgical debridements.

He was a nonsmoker.

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Review of systems was negative for claudication and rest pain.

Physical exam revealed deformity of both feet with neuropathy. Pulses were palpable throughout both lower extremities. The left heel ulcer probed to the bone and was macerated due to excessive serous drainage.

### Before Treatment



### Work Up

The initial work up included an X-ray of the left foot and a bone scan, which demonstrated a calcaneal fracture and osteomyelitis.

### X-ray



Arterial Doppler revealed ABI's of 1.4 of the right and 0.98 on the left. ESR was elevated, and a wound culture was positive for E. coli and Pseudomonas.

### Treatment

Initial treatment included surgical debridement, Iodosorb, off-loading with a Multi Podus Boot, and Cipro.

Transcutaneous oximetry revealed reversible hypoxia around the ulcer, and hyperbaric oxygen therapy (HBOT) was begun. He underwent intermittent debridements. The wound was dressed with Iodosorb and gauze, which controlled the excessive drainage.

### Initial Treatment



Due to the extensive necrotic tissue, the patient required a wide surgical debridement of soft tissue and bone.

## Debridement



Postoperatively, the patient spiked a temperature of 101 and cultures were positive for MRSA, which was treated with IV Vancomycin. A few days later, the patient tried to walk on his heel and noted a "pop". CT revealed an extended fracture of the calcaneus.

## CT Scan



Repeat Infectious disease and orthopedic consults were obtained and the patient required another extensive debridement of the heel.

## Debridement



Persistent infection with purulent drainage required intensive local wound care. The infection subsided and follow up Transcutaneous Oximetry on air improved revealing that angiogenesis had progressed to a point that Hyperbaric Oxygen Therapy could be discontinued. Once all the complicating factors were controlled, the wound closed with local wound care.

## Closing Wound



## Conclusion

A nonhealing diabetic ulcer often leads to a LEA, which carries with it a high rate of morbidity and mortality. A focused multidisciplinary approach to heal diabetic ulcers is necessary not only to prevent amputation, but also the high mortality rate associated with lower extremity amputation.

## THE PRIMARY CARE PHYSICIAN SHOULD REFER THE PATIENT FOR ADVANCED WOUND CARE IN A WOUND HEALING CENTER IF THE PATIENT:

- Has a wound that persists for more than 30 days after treatment
- Has a wound and Reynaud's phenomenon
- Has purpura
- Has a wound and hypertension
- Has gangrene or necrotic tissue in a wound
- Has a wound and diabetes

## About Precision Health Care

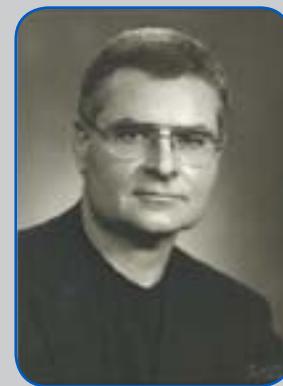
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Community-based and patient-focused, we are driven by this mission philosophy: To provide select hospitals safe, comprehensive, compassionate wound healing and hyperbaric services for patients in need.

## Questions or Comments?

**Contact us:**  
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## About the Author



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