

# Circulator Boot Therapy to Heal Diabetic Foot Ulcers with Osteomyelitis

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## Background/Objective

Current standard of care for osteomyelitis associated with diabetic foot ulcers (DFU) is surgical resection of the infected bone and systemic antibiotics. Despite aggressive therapy amputation is common leaving the patient at risk for additional amputations and an associated five-year mortality rate of 39-68%. Preventing amputation is therefore critical to maintaining quality of life.

Circulator boot therapy (CBT) utilizes end diastolic pneumatic compression to improve arterial circulation in the leg, thereby promoting wound healing. CBT has been used in the management of DFU complicated by osteomyelitis by combining compression with local injection of antibiotics into the affected area. We have validated the effectiveness of this technique to treat patients with DFU and underlying osteomyelitis.

## Methods

The study group consisted of patients with DFU and radiographically diagnosed osteomyelitis who failed to heal despite antibiotics, aggressive offloading and appropriate local wound care. Surgical debridement was refused by all study patients. Patients received three, forty-five minute CBT sessions per week plus weekly local injections of antibiotic solution into the wound as determined by culture results. Aggressive offloading and appropriate local wound care efforts were continued.

## Conclusions

Osteomyelitis complicating a DFU is often associated with amputation. CBT combined with local antibiotic injection has been shown to be effective in the management of selected patients in this group and should be considered prior to amputation.

1. Dillon RS: Successful treatment of osteomyelitis and soft tissue infections in ischemic diabetic legs by local antibiotic injections and the end-diastolic pneumatic compression boot. Ann Surg 204:643-9, 1986.
2. Dillon RS: Treatment of osteomyelitis in the diabetic foot with systemic and locally injected antibiotics and the end-diastolic pneumatic compression Case studies. Vasc Surg 24: 683-696, 1990.

## Results/Case 1

S.S. is a 53 year-old female with a history of diabetes, neuropathy, hypertension and a 4 month history of nonhealing bilateral great toe ulcers colonized with MRSA. Wounds failed to heal in spite of appropriate antibiotics, local care, offloading, normal TCPO<sub>2</sub> values and diabetes control. X-ray confirmed osteomyelitis of the distal phalanx of bilateral great toes. Circulator boot therapy was initiated on a 2-3 time per week schedule as well as topical cadexomer iodine dressings. The patient received 14 dry circulator boot treatments as well as weekly gentamicin injections into the wounds times three. By the 14th circulator boot treatment the wounds were completely healed. The patient was fit for custom orthotics and remains healed.



Right D1 - Pre CBT



Right D1 - Post CBT



Left D1 - Pre CBT



Left D1 - Post CBT

## Results/Case 2

S.L. is a 77 year-old female with a history of diabetes, hypertension, hypercholesterolemia and several month history of a first MTP plantar ulcer. Wounds failed to heal in spite of normal ankle-brachial indices, local care, serial debridement, offloading, diabetic control and a course of antibiotics. WBC labeled bone scan was obtained demonstrating osteomyelitis. Circulator boot therapy with local antibiotic injections was initiated along with a silver dressing. S.L. healed with a course of 19 dry circulator boot treatments and 4 weekly injections of gentamicin into the wound.



Pre CBT



Post CBT #16 with injections