



# TOPICAL WOUND OXYGEN THERAPY IN WORSENING DIABETIC FOOT ULCERS: A CASE REPORT

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**INTRODUCTION:** Diabetic Foot Ulcers (DFUs) are a frequent complication of diabetes with attendant morbidity and mortality. There is some increasing evidence that supports the use of Topical Oxygen Therapy (TOT) in chronic DFUs when used in combination with standard wound care<sup>1</sup>. Specifically, Topical Wound Oxygen Therapy (TWO2) applies cyclically pressurized humidified oxygen within a single use extremity chamber connected to an oxygen concentrator<sup>2</sup>.

## CLINICAL CASE:

### 0. Demographics and medical history:

- > 58 year old male
- > Type 2 diabetes mellitus diagnosed at 33 years
  - > Proliferative retinopathy
  - > End-stage renal disease, on chronic dialysis
  - > Ischemic cardiomyopathy, ↓ ejection fraction (on heart transplant waiting list)
- > Arterial hypertension

### 1. Admission

Admitted to our Diabetic Foot Clinic in February 2022.  
 → Two ulcers in the left foot with local inflammatory signs and fever (figure 1).  
 → Hospitalized and started intra-venous antibiotics (piperacillin + tazobactam and vancomycin) and standard wound care.

### 2. Worsening

→ Four days later, an abscess in the medial portion of the lower leg was identified (figure 2) and surgical drainage and debridement were performed (figures 3-4)  
 → The patient maintained severe deep burning pain and paresthesias, prompting an emergent fasciotomy (figure 5)  
 → Bone microbiology revealed methicillin-sensitive *staphylococcus aureus* and antibiotherapy was adjusted accordingly  
 → Ulcers and surgical wounds kept worsening (figure 6-11) and, after exclusion of arteriopathy and calciphylaxis with vascular study and skin biopsy, **TWO2 was tried**.  
 → A partial first ray amputation was performed due to dry gangrene of the toe with osteomyelitis of the first metatarsal head (figure 20).

### 3. Discharge

→ Completed three weeks of treatment with sustained improvement, with reduction in ulcers size and depth (figures 13-22).



Figures 1-22. Wound evolution in chronological order

**Conclusion:** This case highlights the difficulty of treating DFUs in patients with multiple comorbidities and microvascular impairment. In complicated refractory cases TOT may be considered as a potential adjunctive therapy in the treatment of DFUs.

References: 1. Frykberg, R.G. Topical Wound Oxygen Therapy in the Treatment of Chronic Diabetic Foot Ulcers. *Medicina* (2021); 2. Serena, T. et al. Topical oxygen therapy in the treatment of diabetic foot ulcers: a multicentre, open, randomised controlled clinical trial. *Journal of wound care* (2021).