The Use of Pressurized Topical Wound Oxygen Therapy (TWOT) for Treatment of a Chronic Foot Ulcer in a Patient with Diabetes Mellitus and Peripheral Arterial Disease

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Introduction. Foot ulcers especially when confounded by comorbidities such as Diabetes Mellitus and impaired blood flow are extremely difficult to heal[1, 2]. Therefore, therapeutic options to improve healing rates are continuously being explored. It has been studied that Oxygen is essential to wound healing and is vital in the synthesis of collagen, fibroblast enhancement, angiogenesis and leukocyte function [3, 4]. Hyperbaric oxygen (HBO) has been used in addition to standard treatment of the diabetic foot for more than 20 years [5]. However topical oxygen treatment has not been studied to this extent. Topical wound oxygen therapy (TWOT) is a portable device that delivers pressurized oxygen to the wound. TWOT involves pressures rated at 50 millibars whereas traditional HBO is rated at 1013.25 millibars.

Treatment and Outcome. TWOT was applied for 2 hours each day, 3x/week. Patient’s dressings were changed 3x/week by home health care nursing staff. Sharp debridments were carried out at weekly visits. Wounds were dressed with Prisma, wound gel, foam, and dry sterile dressings.

Average Initial measurements: 5.6 cm X 3.5 cm X 2.3 cm showed granular bases, viable borders. Undermining and probe to bone testing were negative.

3 months post-therapy, Wound Improved

Discussion. Evidence suggests that TWOT may have increased tissue oxygenation and improved the likelihood of healing the diabetic foot ulcers despite impaired blood flow to this limb. More experience is needed before its broad implementation in the routine care of the diabetic foot however, TWOT appears promising, and is an adjunct therapy that can be implemented in such patients.

Conclusion- The use of Topical wound oxygen therapy* (TWOT) is an effective and viable treatment option for aid in attempt at limb salvage. TWOT was applied for 2 hours each day, three times a week for 3 months and showed improvement in the described wounds.

References-

Patient Information- We present a case consisting of four DM2 male patients with ages ranging from 65 to 75 with associated Peripheral Arterial Disease. One patient in the study had undergone digital amputation of the left lower extremity. All wounds have been open and receiving treatment for greater than 6 months and are deemed chronic. All patients had undergone previous treatments consisting of standard wound care including wet to dry dressings, NPWT, advanced wound care modalities consisting of amniotic based therapies. All patients were adequately offloaded in a CAM Boot with cutouts to accommodate the ulcerations. The average wound at presentation was 5.6 cm x 3.5 cm x 2.3 cm. During the study, the patients showed vast improvement in wound size with an average size of 1.6 CM x 1.0 CM x 0.9 MM. One patient went on to full closure during the study.