

Oxygen-Ozone Treatment of Leg Ulcers

A Personal Experience

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SUMMARY - *This paper describes the Oxygen-Ozone treatment of leg ulcers of different aetiology: venous stasis, trauma and diabetes. Oxygen-Ozone was applied topically using a bag closed by a bandage and kept in place for 20 minutes after insufflation of the O₂-O₃ gas mixture.*

Introduction

This paper describes the oxygen-ozone treatment of leg ulcers of different aetiology: venous stasis, trauma and diabetes. Before undergoing treatment all patients were examined and had arterial and venous echo-colour Doppler (ECD) examination. The ulcers were washed with ozonized water and surgical debridement carried out when necessary.

The oxygen-ozone was applied at an initial concentration of 25-30Y until the lesion was covered completely and then the dose was reduced. The gas mixture was applied topically using a bag closed by a bandage and kept in place for 20 minutes after insufflation of the O₂-O₃ gas mixture. Patients underwent O₂-O₃ treatment sessions twice or three times a week until complete granulation of the ulcer fundus followed by once weekly treatment thereafter.

Case Reports

Ulcers caused by venous stasis

The first group of patients had ulcers caused by venous stasis.

The first patient, a 72-year-old man had undergone saphenectomy of the left great saphenous vein ten years earlier. ECD disclosed a large incontinent perforating vein in the inferior third of the left leg maintaining an ulcer over the internal malleolus. In addition to O₂-O₃ treatment, the patient applied a gauze pad impregnated with hyaluronic acid plus silver sulphadiazine (Connettivina plus cream) at home, and wore a compression sock with the first degree of elasticity when walking. Pain subsided

from the first treatment sessions and the ulcer improved healing completely in three months (figure 1 A-F).

The second patient was a 70-year-old woman with a small very painful ulcer over the left internal malleolus. She presented severe reflux of the left great saphenous vein and cutaneous dyschromia caused by chronic venous insufficiency.

The patient underwent twice weekly sessions of O₂-O₃ treatment accompanied by home medication applying a gauze pad impregnated with hyaluronic acid plus silver sulphadiazine (Connettivina plus cream) and compression stockings with the first degree of elasticity. Her ulcer healed completely in one month (figure 2 A-D).

Ulcers caused by trauma

The second group comprised five patients with post-traumatic ulcers.

The first patient, a 80-year-old woman, a heavy smoker, presented a large lesion over the pretibial region. ECD disclosed reduced peripheral flow due to arteriopathy in different body districts. The necrotic flap of the ulcer was resected and she underwent twice weekly sessions of O₂-O₃ treatment. Her ulcer healed completely in one month (figure 3 A-D).

The second patient, an 84-year-old woman, had lung and heart disease and was receiving oral antiplatelet therapy. She presented a bleeding ulcer on the middle third of the leg. She underwent twice weekly sessions of O₂-O₃ treatment accompanied by home medication applying a gauze pad impregnated with hyaluronic acid plus silver sulphadiazine (Connettivina plus cream). The patient's ulcer healed in one month but she returned one week later for treatment of a second lesion on the same leg (figure 4 A-F).



A



B



C



D



E



F

Figure 1 A-F A 72-year-old man with an ulcer over the internal malleolus caused by venous stasis.



Figure 2 A-D A 70-year-old ulcer over the left internal malleolus.



Figure 3 A-D Post-traumatic ulcer over the pretibial region.



A



B



C



D



E



F

Figure 4 A-F An 84-year-old woman with a bleeding post-traumatic ulcer.



A



B



C

Figure 5 A-C A 73-year-old man with a post-traumatic fistulous lesion.

The third patient, a 73-year-old man, had been involved in a road traffic accident with D12 fracture, fracture of the tibial plate and injury to the posterior cruciate ligament of the left leg. After surgery and a plaster cast worn for 40 days, he presented a fistulous lesion over the middle third of the leg, partly epithelialized. Surgical debridement was required with insertion of a plug before administering three sessions a week of O_2-O_3 treatment for two months until the ulcer had healed completely (figure 5 A-C).

The fourth patient, an 85-year-old man with heart disease had undergone surgery for laryngeal carcinoma ten years earlier.

He had severe arteriopathy with a large cuff ulcer on the left leg for about two years.

Only a few O_2-O_3 treatment sessions were administered prior to hospital admission due to the patient's general condition (figure 6 A-G).

The fifth patient, an 80-year-old obese woman with chronic venous insufficiency, presented mul-

tiples ulcers on her left leg caused by stasis eczema that the patient had repeatedly scratched. She received O_2-O_3 treatment sessions three times a week for one month accompanied by home treatment with vitamin E (tocopherol) in the form of an oil (Vea olio) applied once daily. The patient's ulcer healed in two months (figure 7 A-C).

Ulcers caused by diabetes

The third group comprised two diabetic patients referred by the Diabetic Foot Centre of Cremona Hospital due to poor response to current treatments.

The first patient, a 73-year-old man, had a large foot ulcer he had been treating for eight months. He received O_2-O_3 treatment sessions three times a week for one month. His ulcer healed in six months (figure 8 A-F).

The second patient, a 75-year-old man, had



A



B



C



D



E



F



G

Figure 4 A-F An 84-year-old woman with a bleeding post-traumatic ulcer.



A



B



C

Figure 7 A-C An 80-year-old woman with multiple ulcers caused by scratching.

undergone amputation of four toes of his left foot due to gangrene.

He presented a huge ulcer at the base of his big toe. He received O_2-O_3 treatment sessions three times a week until the ulcer was reduced. He was then admitted to hospital for a skin graft (figure 9 A-E).

Lastly, a patient with nodular vasculitis is included here. This 65-year-old woman had presented with painful ulcers on her left foot and distal third of the leg and swollen leg.

At that time I could not perform O_2-O_3 treatment due to a broken elbow so the patient was given low weight molecular heparin, azithromycin and topical medication.

After two days of treatment she presented an allergic reaction with urticaria and necrosis of the epidermis and dermis of the foot leading to hospital admission.

The patient's ulcers subsequently healed after a month of medical management and three months of medication (figure 10 A-D).



A



B



C



D



E



F

Figure 8 A-F A diabetic patient with a large foot ulcer.



A



B



C



D



E

Figure 9 A-E A diabetic patient who had undergone amputation of four toes. A large ulcer can be seen at the base of his left big toe.



A



B



C



D

Figure 10 A-D Allergic reaction to topical application of low molecular weight heparin, azithromycin and topical medication in a patient with nodular vasculitis.

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