# The use of topical ozone to treat recurrent aphthous ulceration

Recurrent aphthous ulceration is a common mucosal disorder that can be painful and debilitating for patients. This type of ulceration has been associated with systemic disease and it has been suggested that a variety of immunological, microbial and genetic factors may all play a role in its aetiopathogenesis. A wide variety of treatment strategies for aphthous ulceration has been discussed in the literature. This case report demonstrates the beneficial use of topical application of ozone using the Healozone‘ appliance (Kavo) in a patient with long standing aphthous ulceration involving the lateral border of the tongue. The topical application of ozone provided an effective means of producing resolution of clinical symptoms related to aphthous ulceration for this patient. Further clinical investigation is required in order to determine the potential of this treatment modality in the treatment of recurrent aphthous ulceration.

By Dr Richard Logan

Recurrent aphthous ulceration is a common mucosal disorder that can be painful and debilitating for patients. This inflammatory condition has no known aetiology and has a variety of clinical manifestations ranging from single to multiple ulcers affecting the oral mucosa. Three variants of aphthous ulceration are recognised and include *minor aphthae*, which are characterised by round or oval shallow ulcers generally less that a centimetre in diameter. Minor aphthous ulcers are the most commonly encountered variant and usually occur on non-attached mucosa such as is found on the floor of mouth, labial mucosa and buccal mucosa. These lesions generally heal within ten days or so without scarring. *Major aphthous ulcers*, on the other hand, are less common and are often larger than the minor form. These ulcers can persist for extended periods of time and when they do eventually heal, heal with scarring. Major aphthae, like the minor variant are more likely to occur on non-attached mucosa rather than areas such as the gingivae and hard palate. The third and least common form of aphthous ulceration is the *herpetiform variant*. These ulcers are small, only one to two millimetres in diameter; however in some cases there may be up to 200 ulcers present at any one time. Like minor aphthae, these ulcers heal within a relatively short period and heal without scarring. Aphthous ulceration has also been associated with various systemic diseases, most importantly, Behçets disease and coeliac disease.[1,2] It has also been reported in association with HIV infection.[3] In addition aphthous ulceration has been reported in association with various deficiencies including vitamin B12, folate and iron.[4]

Because the aetiology of aphthous ulceration is poorly understood, treatment options for patients are largely palliative and aimed at reducing symptoms thereby improving oral comfort. A diverse range of treatment strategies have been reported in the

Fig. 1: Photograph demonstrating the clinical appearance of a major aphthous ulcer on the left lateral border of the tongue. The raised fibrotic margins are evident clinically.

Fig.2 : Photograph demonstrating the clinical application of topical ozone to the ulcer using the Healozone‘ appliance (Kavo).

This case report demonstrates the apparent beneficial use of topical ozone application using the Healozone appliance (Kavo) in a patient with long standing aphthous ulceration involving the lateral border of the tongue.

## Case report

A 56 year old female was referred to the Special Needs Unit of the Adelaide Dental Hospital with a two year history of recurrent oral ulceration. Apart from a history of sino-nasal polyposis and asthma she was medically well. Initial examination of the patient demonstrated multiple minor aphthous ulcers involving the lower labial mucosa. A larger ulcer was present on the lateral border of the tongue and according to the patient this had been present for a period of two years or more. This ulcer was deep and had raised fibrotic margins. This ulcer had, in fact been biopsied previously because of its clinical similarity to a squamous cell carcinoma. The patient had previously had a thorough investigation with respect to the ulceration and no underlying nutritional deficiency or associated systemic disease was detected. The ulcers were localised to her mouth.

Topical steroids were initially used to treat the ulcers without much success. Generally the minor aphthae affecting the labial and buccal mucosae and floor of the mouth healed within seven days, however within this time new ulcers had started to form. The deeper ulcer on the tongue persisted. Subsequently the patient developed pneumonia related to her asthma and as part of her treatment was placed on systemic prednisolone. During the period that she was on this medication the oral ulceration resolved, the tongue ulcer persisted but symptoms associated with it were reduced. On cessation of the prednisolone the ulceration promptly returned. The patient was reviewed again one month following the cessation of prednisolone during which time she had ceased using all forms of topical preparations. During this time, the Special Needs Unit of the Adelaide Dental Hospital gained access to a Healozone‘ appliance (Kavo) and it was felt that it would be interesting to see whether the use of ozone had any impact on the aphthous ulceration in this patient. The patient agreed to have the ozone applied to her ulcers, particularly the tongue ulcer which was causing the greatest degree of discomfort (Figure 1).

Initially the ozone was applied for a period of sixty seconds (Figure 2). The patient did not experience any pain or discomfort from this procedure. The patient was reviewed again 2 days later and clinically there was no change to the ulceration. A further treatment of ozone was applied to the lesion for sixty seconds. On review, one week later, the patient reported a slight improvement in symptoms, however clinically the tongue ulcer was still present. Various treatment

literature and include topical agents including analgesics and anaesthetics, steroids and antibacterial mouthwashes as well as systemic treatment including drugs such as prednisolone, azathioprine and thalidomide.[5,6,7] These systemic treatments have potentially serious side effects that may contraindicate their use in some patients and should only be prescribed by experienced practitioners.

Fig. 3: Photograph demonstrating the clinical appearance of the left lateral border of the tongue one month following the clinical application of ozone.

options were discussed with the patient including excision of the ulcer, however the patient was not keen on this and needed to consider her options. It was decided to review the ulceration within one month. At the review appointment the patient reported that the ulcer had completely healed. Clinically this was apparent with no evidence of residual ulceration on her tongue (Figure 3). The patient had not used any topical agents or taken any systemic medication during the time subsequent to the application of ozone.

## Discussion

Aphthous ulceration can be a painful and debilitating problem for patients, particularly when multiple ulcers occur simultaneously. As a consequence, the occurrence of ulceration often impacts on normal function resulting in difficulties with eating and speaking. Effective treatment and management of pain is essential for patients affected by these lesions.

There are very few reports of the use of ozone as a treatment modality in the literature. The earliest in 1957 reported the beneficial effects of ozone on the healing of leg ulcers.[8] The beneficial use of ozone on the healing of chronic leg ulceration was reported by Thwaites and Dean in 1985.[8] They reported that out of 73 patients with chronic leg ulcers who were treated with ozone, 59 demonstrated satisfactory healing. More recent reports of the use of ozone include the treatment of skin reactions following radiotherapy[9] and the treatment of lower limb ischaemia.[10] The reported benefit of using ozone is equivocal. The beneficial effect of ozone has been attributed to improved blood oxygenation, reduced blood viscosity and lower aggregation of platelets.[8] Ozone also has properties that make it effective in destroying various microorganisms including bacteria, viruses, fungi and protozoa.[8,10] In terms of wound healing it has been suggested that the use of ozone potentiates the inflammatory reaction that occurs.[8,9,10]

The use of topical ozone for the treatment of recurrent aphthous ulceration requires further investigation before it can be advocated as a valid treatment option for these lesions. Further investigation is also required to determine the exact aetiopathogenesis of aphthous ulceration in order to help develop specific and targeted treatments for this potentially debilitating condition. In the meantime however, topical ozone application may be a further option for patients with this debilitating condition for whom other treatment options have been exhausted or for whom systemic treatment is contraindicated. **DA**

## References


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