



## Ozone Teeth Whitening: Personalized Trays for Young Patients

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### Abstract

Aesthetic treatments are in great demand in the dental office, aimed at recovering the aesthetic aspect of the smile. Patients become aware that having pleasant teeth in terms of color, shape and shine are synonymous with greater confidence and personality in the social and work environment.

Everyday, new dental lightening/whitening protocols are being sought to counteract the adverse effects of traditional techniques, with great interest in the use of ozone gas in different dental areas, including cosmetic dentistry.

Whitening systems with high concentration hydrogen peroxide gels have been shown to alter the mineralized structures of enamel and dentin, which is why they are contraindicated especially in adolescents due to the possible damage to said structures; as well as the pulp organ.

Applying ozone in lightening/whitening shows a highly predictable result, it does not generate sensitivity or damage to the enamel or gums compared to hydrogen peroxide.

At the end of the case, the clearing effect of ozone was verified in an adolescent patient using the customized modified trays, preserving the oral tissues.

**Keywords:** Bleaching; Hydrogen; Peroxide; Carbamide; Ozone; Dentistry

## Introduction

Through the evolution of humanity, the color of the teeth has prevailed as an aesthetic and cultural factor. Reference is made from 2000 a. C. there was a Japanese custom “in the upper class” of darkening the teeth “Black tone or Brown color” [1].

During the first century of the Roman Empire, dental cleaning was carried out with urine, preferably of Portuguese origin, to obtain whiter teeth.

Currently, tooth whitening/clearing is a treatment to improve the unsightly color of teeth. It is carried out exclusively by the Dentist under supervision [2].

The use of whitening gels in high concentrations has been warning about possible damage to teeth. Other dental conditions that cannot be solved through whitening will be through aesthetic veneers.

Al Salehi, *et al.* (2007), found that dental whitening agents could negatively affect tooth structure, due to increased concentrations of hydrogen peroxide and its increased ion release in both enamel and dentin, and that enamel microhardness was significantly decreased. with rinsing [3].

The current in-office hydrogen peroxide whitening technique typically uses different concentrations of hydrogen peroxide, between 3 and 40% with or without light and in the presence of gingival isolation [4,5].

Medical ozone gas has different therapeutic applications in the medical and dental fields [6].

Since the German Chemist Christian Frederick Schonbein discovered ozone, until today, this gas has been used in different areas of medicine and in Dentistry its use has been used for the vast majority of treatments [7].

Medical ozone gas is effective against hypersensitivity in dental tubules; it is hydrophilic (it diffuses easily in the water of the tubules due to its low molecular weight, oxidizes bacteria, and attacks structural carbon double bonds) [8].

“Currently for bleaching treatments without possible damage to teeth, the use of ozone as a bleaching agent has been proposed,

taking advantage of its hyperoxidizing characteristic against the carbon double bonds of chromogenic bacteria, pigments and chromophores, in addition to its low molecular weight that allows it to diffuse easily through enamel and dentin, taking advantage of its hydrophilic nature”.

In a randomized study taking 32 participants divided into two equal groups as a sample, a comparative study was carried out for dental whitening, one with hydrogen peroxide and the other with ozone. A superior result was concluded using ozone, in addition to this absence of dental sensitivity [9,10].

## Clinical Case Reports and Discussion

Male patient, 18-year-old, Caucasian, single, college student. Attend the consultation for color defects presented in the enamel.

He eats a healthy diet, but the color change in his teeth has been observed.

At clinical examination the decreased thickness of enamel is observed.

On the first visit, the complete evaluation of the patient, dental prophylaxis, and occlusal evaluation of the patient were performed, and the signing of the informed consent was requested. As well as the primary impression for the preparation of personalized trays.



**Figure 1:** Start photo.

In the second visit, after the color selection, the analysis of the models, the preparation of the modified individual tray for the ozone application, the first ozone application was carried out for a period of 40 minutes at 60 micrograms.



**Figure 2:** Application of ozone in patient.



**Figure 3:** Final photo.



**Figure 4:** Final photo.

### Informed consent

The patient signed the informed consent, about the publication of his case and the taking of photographs for the documentation of the same.

### Conclusion

1. Ozone tooth whitening/whitening procedure proved to be highly effective on young teeth with no adverse effects.
2. Absence of dental sensitivity was verified.
3. Absence of damage to soft tissues was verified.
4. The importance of using a customized modified tray with a peripheral seal for bleaching/whitening teeth with ozone, allows to improve the final result, in addition to offering greater safety during the process.
5. It is recommended to use ozone for dental bleaching/whitening using this new protocol, using a modified tray with a high peripheral seal.

### Conflict of Interest

Authors declares no conflict of interest exist.

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