

First whitener for fixed-braces orthodontics

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Fig. 1_ Patient under orthodontic treatment.

Fig. 2_ Close up of patient under orthodontic treatment.

Fig. 3_ Treswhite Ortho ready to be used.

The following article describes the use of a new dental whitening product based on hydrogen peroxide (H_2O_2). The effect of this compound whitens dentine in multidirectional angles, reaching areas covered by brackets, making it possible to achieve teeth whitening under braces. Patients are very willing to use this whitening procedure, both in-office and at home, because they want to achieve white teeth while under orthodontic treatment. The result is a whitening technique that also achieves a marked increase in patients' oral hygiene habits.

1989, Haywood and Heymann described a technique for daily use that used a low carbamide peroxide concentration to remove deeper teeth stains, which increase with age.²

_Dental whitening popularity

The success of H_2O_2 -based teeth whitening products has been accepted and validated by research. The successful use of H_2O_2 for dental whitening, using different techniques for in-office and at home treatment, has been described by many authors.³ Messages on TV and in newspapers, magazines and other media have popularised dental pigments and teeth-stain removal, caused by age, food, cigarettes, tea, and beverages with colorants, amongst others causes. People ask for dental whitening treatments to achieve better aesthetics, improve their smile and their self-esteem, all of which are closely related to dental pigmentation.⁴

Fig. 4_ Treswhite Ortho tray in the upper maxillary.

Fig. 5_ Removing the external bleaching tray allows the internal bleaching tray to remain in position.

Fig. 6_ Upper and lower bleaching trays in position with H_2O_2 in close contact with the teeth.

The use of the H_2O_2 as a dental whitening agent was first described by Kingsbury in 1861. The dentists' desire to provide fast and effective teeth whitening procedures was described by Abbot in 1918, when he introduced a wonderful and revolutionary in-office dental whitening technique—a 35 % H_2O_2 concentration together with heat emission from a lamp to increase oxidation.¹ In





Fig. 7

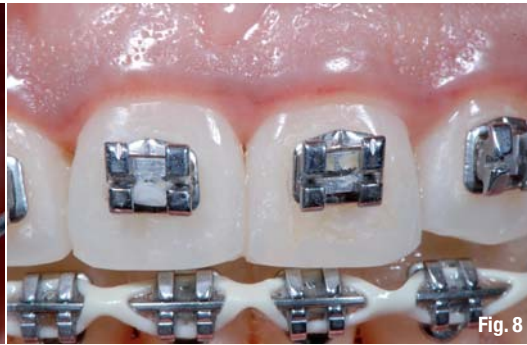


Fig. 8



Fig. 9

Patients under orthodontic treatment are convinced they must maintain their oral health regarding colour and aesthetics. Dentists and patients understand that there is the possibility of generating gingival irritations and dental pigmentation alterations caused by bacterial plaque accumulation around orthodontic devices, such as brackets, bands and arches, which adds to the process of decalcification and to long-term adverse factors, such as a poor oral hygiene. Conventional home care includes tooth brushing (mechanical or manual), irrigation devices, fluoride mouth rinses, topical fluoride applications and dental floss. But even with all this armamentarium, there is low motivation on behalf of patients.⁵

The vast majority of these devices and techniques used for oral health and hygiene are not implemented by the majority of patients that go at least twice per year to the dental office, and therefore benefits and results are not really significant. We should emphasise other alternatives that add to the above and that with patient awareness could help us improve the oral health of patients undergoing orthodontic treatment.

Health and aesthetics

Oral health and hygiene are important factors to keep in mind for patients who are being treated with orthodontic devices; excellent oral hygiene is associated with the desire for appropriate dental aesthetics during and after treatment. By appealing to this desire for optimal aesthetics, we can

implement parallel treatments that will maintain optimal periodontal health and at the same time protect teeth by increasing enamel micro-hardness and making teeth less decay prone. Owing to the new dental whitening that contains fluoride and potassium nitrate ions, this is possible.⁵

For these patients, we helped develop a product called Opalescence Treswhite Ortho (Ultradent, Opal Orthodontics) that prevents decalcification resulting from bacterial attack, which is responsible for carious lesions, and increases enamel micro-hardness.

Treswhite Ortho is applied with an entrenched external tray, which holds another very flexible one for home or in-office use, and is easily adaptable to teeth and brackets topography. This flexible tray contains an 8 % concentration of H₂O₂, fluoride and potassium nitrate. The flexible tray containing H₂O₂ should be kept on the brackets for 45 minutes in order to achieve adequate contact time between whitening gel, teeth and brackets. After each 45-minute daily session, the soft tray is easily removed from the mouth and discarded, and after that the patient removes any remnants of gel by brushing.

Treswhite Ortho is the first dental whitening method that works on fixed orthodontic devices and on preventing enamel demineralisation. The use of H₂O₂ for bacterial and plaque removal, and gingival tissue healing or scarring removal was proved more than 35 years ago.⁶⁻⁹ Bacteria such

Fig. 7 After ten days of whitening treatment we started the removal of the orthodontic devices.

Fig. 8 Brackets over the teeth, ready to be removed.

Fig. 9 Notice teeth colour in the area in which the bracket was located after the first bracket is removed.

Fig. 10 Regular colour under bracket, no colour differences were found.

Fig. 11 Colour matching using the VITA Easy Shade spectrophotometer.

Fig. 12 Colour matched (B2) showing in the Easy Shade screen.



Fig. 10



Fig. 11



Fig. 12



Fig. 13 Colour matching using the VITA Classical (Lumin Vacuum).

Fig. 14 Final result after ten days' use of Treswhite Ortho and brackets removal.

Fig. 15 Patient smile shows uniform colour in all the anterior teeth.

as *Streptococcus mutans* and *Lactobacillus* are responsible for the white spot lesions caused by enamel demineralisation. Both types of bacteria are anaerobic, meaning that they need a dark, warm and oxygen-free environment to survive, because their organisms are unable to eliminate or detoxify in the presence of oxygen radicals.¹⁰ Conversion of H₂O₂ to nascent oxygen causes tissue and oral environment oxygenation, and subsequently creates an inadequate environment for bacteria growth and reproduction.

Overcoming reluctance

Many young and adult patients are reluctant to wear fixed orthodontic brackets because of their unattractive aesthetic appearance. Adequate oral hygiene is more difficult to achieve when wearing these devices, and after months or years of treatment, patients' teeth usually become dark or pigmented, thus increasing patient rejection of orthodontic treatments.

The use of pre-medicated, adaptable and malleable trays for home or in-office treatment is an excellent and easy way to offer patients the opportunity to have sparkling white teeth during orthodontic treatment.¹¹ Treswhite Ortho whitening power has a predictable benefit. H₂O₂ has a low molecular weight of 32 mg/m, which allows its easy diffusion through enamel to dentine.¹² Once it spreads to the dentine, oxygen molecules act upon the dark pigments rotating and fragmenting them, creating a whitening effect in the dental structure.¹³ In addition, Treswhite Ortho H₂O₂ conversion to oxygen is highly beneficial for eliminating gingivitis, owing to the ability to provide the extra oxygen required during the high-oxygen consumption by the inflamed gingival tissues.^{12,14}

H₂O₂ whitens poly-directionally inside the teeth, even underneath places covered by orthodontic devices such as brackets, making it possible to obtain homogeneous whitening on patients wearing orthodontic devices.¹² Patients are very receptive and keen to use this whitening product. Addition-

ally, dental whitening increases the responsibility for maintaining a good oral hygiene.

An 18-year-old patient is more receptive to a treatment based on a dental whitening product than to brushing with fluoride toothpaste or using anti-plaque mouth rinses. This is quite evident when removing the soft Treswhite Ortho tray, since teeth must be vigorously brushed to remove the remnants of the viscous H₂O₂-based whitening gel. The result is chemical and mechanical removal of filaments and bacteria from the teeth surface and brackets.

As oral health professionals, we desperately seek to increase patients' awareness of functional, healthy and aesthetic orthodontic treatments. Treswhite Ortho is effective in removing bacteria and achieving enamel hardness, leaving patients with bright and sparkling teeth. But more importantly, it leaves teeth healthy and free of fissures. This type of result must form the basis for our new maintenance and care methodology for modern orthodontic therapies.

Editorial note: A complete list of references is available from the publisher.

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