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Case Report

In-Office Tooth Bleaching Treatment Using Light-Activated Hydrogen Peroxide Agent: A Case Report

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Abstract

Tooth bleaching has become a popular cosmetic treatment among patients that want to enhance their esthetic appearance. In addition, light-activated bleaching gels have been growing among dental professionals mainly due to the fastening of the whitening procedure and/or therapeutic purposes. Thus, the objective of this case report was to present the bleaching protocol and efficacy of a light-activated bleaching agent. A 35% hydrogen peroxide gel (Lase Peroxide Sensy, DMC Equipments, Brazil) was applied following the manufacturer directions and using a hybrid light-laser source (Whitening Lase II, DMC). After the bleaching procedure, a satisfactory whitening effect was achieved. Therefore, tooth bleaching using light-activated materials is effective and mayaccelerate the whitening process.

INTRODUCTION

Tooth bleaching treatments have emerged in dentistry with a unique but important purpose: to white darkened or stained teeth. Currently, two modalities are available, namely the in-office and the home-use regimens where the former uses materials applied by the professional and the latter one those self-applied by the patients [1]. Notwithstanding, both treatments use hydrogen or carbamide peroxide-based agents, which have been demonstrating effectiveness in whitening stained teeth, even those severely discolored [2,3]. Despite of differences regarding the type and concentration of material used, bleaching agents also differ in the way they are applied [4]. While some products do not need an additional activation procedure, several bleaching agents have been currently marketed with supplementary light sources in an attempt of enhance the bleaching efficacy and/or reduce post-sensitivity side-effects. Nevertheless, according to a systematic review the benefit of the additional use of light is limited [3], and several studies have been demonstrating conflicted results [5-9]. Additionally, another systematic review has concluded that light increases the risk of tooth sensitivity without improving the bleaching effect [10].

Independently of bringing or not benefits to the bleaching treatment, light activated bleaching products are very attractive because they accelerate the clinical procedure by reducing the material's total time of application and because sometimes the light source presents a laser component, which is associated to therapeutic effect that may reduce inflammatory response and/or tooth sensitivity [3]. Hence, the aim of this case report was to present the bleaching protocol and efficacy of a light-activated bleaching agent.

CASE HISTORY

A 24-years-old female was referred to the Department of Operative Dentistry looking for dental bleaching treatment. It was the first time she requested for this cosmetic procedure, and after anamneses and clinical examination it was observed that the patient had her teeth only moderately yellowed (Figure 1) with no report of high consumption of coffee, tea or wine. Notwithstanding, she insisted on receiving the bleaching treatment, so an in-office bleaching regimen was suggested. First the tooth color shade was verified using a color shade guide (Vitapan Classical) by visual examination, and the color shade B2 was chosen as the best match with the patient's natural teeth (Figure 2). Next, OptraGate (Ivoclair Vivadent, Amherst, NY, USA) was used to ensure relative isolation and to provide a full view of the anterior and posterior teeth, and Lase Protect (DMC Equipments, São Carlos, SP, Brazil) was applied at the contour of the gingival tissue in an attempt to avoid the contact between the bleaching gel and the gingiva (Figure 3). Then, the 35% Lase Peroxide Sensy bleaching agent (DMC), which is a hydrogen peroxide-based gel, was applied following the manufacturer directions: 39 drops of peroxide (phase 1) was mixed to 13 drops of thickener (phase 2) with the aid of a spatula and the

mixture was applied using a syringe, covering the buccal surface of all anterior teeth plus the pre-molar ones (Figure 4-a); the gel was then irradiated with the Whitening Lase II hybrid light source (DMC) for 6 minutes (Figure 4-b), and after 10 minutes of application, the gel changed its color (Figure 4-c), denoting that it has lost its active state; finally, the gel was removed from the tooth surface with an aspirator tip and cleaned with some gauze (Figure 4-d), and the bleaching gel was newly applied following the same protocol aforementioned.

After the second application of the bleaching gel, it could be observed a satisfactory whitening of the teeth, where before the bleaching treatment the patient's color shade was matched as B2 (Figure 5-a) and right after the bleaching procedure it was whitened to the BL3 color shade (Figure 5-b). The initial and final images of this case report are shown in Figure 6 (a and b, respectively).

DISCUSSION

Tooth bleaching has become popular in dentistry, and people have been increasingly requesting for this cosmetic treatment. The patient from the present case report was young and her teeth were not extremely darkened (Figure 2), as a B2 color shade is one of the whitest possible shades. However, the patient was anxious for having whiter teeth. Considering that only a yellowish staining pattern was present, the in-office tooth bleaching regimen was suggested, which was promptly accepted by the patient. In-office regimens generally results in faster whitening effect, mainly due to the high concentrated gels used when compared to the home-use regimen, which uses materials with low peroxide concentration but during higher periods of application [11]. Bleaching agents act by an oxidation process of the pigments adhered to the enamel or dentin substrates [12] or by oxidizing the dental organic matrix [13]. Consequently, they act by contact, and according to previous reports bleaching agents are powerful substances that may produce allergenic reactions when they enter in contact with soft tissues, mainly gingiva and lips [14,15]. Thus, two protective products were used

Figure 1 Initial case – the patient had her teeth moderately yellowed.

Figure 2 Color shade selection using the color shade guide (Vitapan Classical). The shade B2 was chosen.

Figure 3 Relative isolation performed using OptraGate (Ivoclair) and gingival protection using Lase Protect (DMC Equipments).

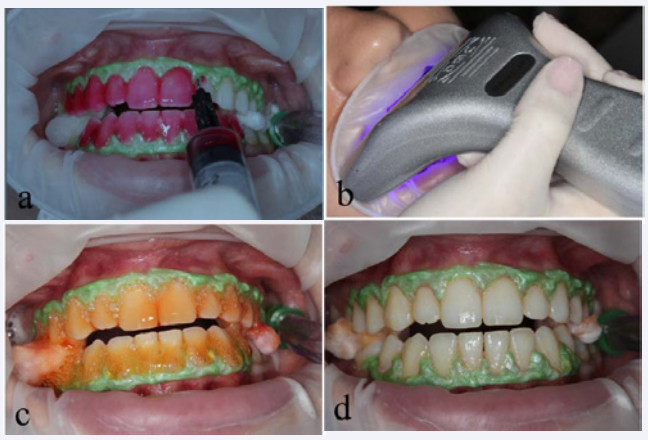

Figure 4 Bleaching protocol for each application of the 35% Lase Peroxide Sensy gel: after mixture of phases 1 and 2 the gel was applied with the aid of a syringe, covering the buccal surface of premolars and anterior teeth (a); next the gel was irradiated with the Whitening Lase II hybrid light source (DMC Equipments) for 6 minutes (b); after 10 minutes of contact between the gel and the teeth, the former changed its color (c); so the gel was removed from the teeth surfaces with an aspirator tip and cleaned with some gauze (d). The clinical steps from "a" to "d" were repeated.

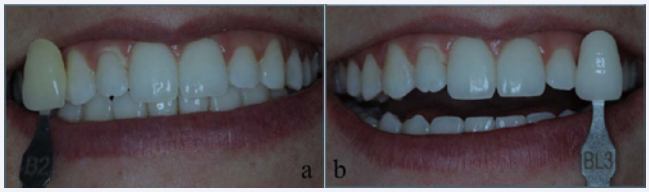

Figure 5 Immediate post-bleaching visualization of the whitening effect achieved with the bleaching treatment by positioning the initial color shade selected (B2) over the bleached teeth (a); and new color shade achieved (BL3, Vitapan Classical) (b).

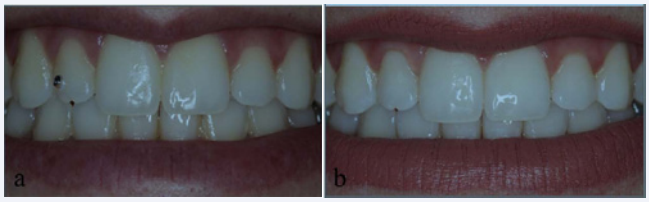

Figure 6 Initial (a) and final (b) images from the present case report. The final photo was taken after one week of bleaching treatment.

in the present case report: the OptraGate and the gingival barrier Lase Protect (Figure 3), which had satisfactorily protected the lips and the gingival tissues, respectively.

Tooth bleaching treatment using in-office materials are commonly applied for approximately 45 minutes per each clinical meeting. Interestingly, the product used in the present case report (Lase Peroxide Sensy) was applied for only 20 minutes (two applications of 10 minutes each) since it is light-irradiated, fact that accelerates the whitening process [16]. It could be observed a satisfactory whitening outcome, where the patient was satisfied with the result achieved. Moreover, reducing the time that the patient is under treatment is extremely important because neither the clinician nor the patient get tired and clinical time is saved for meeting up more patients.

Even though light-activated bleaching agents are commonly associated to higher tooth sensitivity, mainly because it is believed that the light may heat the tooth leading to possible pulp injuries [3], the present case report had no sign of post-bleaching sensitivity, as stated by the patient itself in the next clinical meeting. This may have occurred probably due to the laser component of the Whitening Lase II hybrid light source used to irradiate the gel. Therefore, the combination of light sources (at least that used in this report) with dental bleaching agents is an interesting option to bleaching treatments, demonstrating satisfactory results.

Bleaching is a procedure that removes staining substances from the tooth surface. Considering this, the consumption of staining substances (e.g., coffee, tea, wine) after bleaching may promote a faster darkening of the substrate, vanishing with the whitening effect. Notwithstanding, our patient has related no high consumption of these substances. According to a double-blind randomized clinical trial (followed-up for 2-years) patient's reported that their tooth shade relapsed from mild to moderate when compared to the 1-month evaluation [17]. This shows that bleaching is a procedure that should be repeated after some period of time, since the patient's dietary behavior may individually imply in faster or slower darkening of teeth. In contrast, the study of Giachetti et al. [18] resulted in satisfactory and long-lasting (nine-month follow-up) bleaching, showing that this esthetic procedure may be considered an effective treatment.

CONCLUSION

The bleaching treatment using the light-irradiated bleaching product reported in this case report has demonstrated efficacy and no post-bleaching sensitivity, showing that light may be an interesting complimentary procedure in the fastening of the whitening process.

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