DENTAL BLEACHING: CASE REPORTS THAT ACHIEVED AESTHETICS RESULTS IN DENTISTRY WITH AT-HOME BLEACHING SYSTEMS

CLAREAMENTO DENTAL: DESCRIÇÃO DE CASOS CLÍNICOS QUE OBTIVERAM SUCESSO ESTÉTICO APÓS O CLAREAMENTO DENTAL CASEIRO

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ABSTRACT: Dental bleaching offers a conservative, simplified, and low cost approach to change the color of discoloured teeth. Current bleaching techniques include a dentist-prescribed in-office technique, an at-home applied technique, or a combination of both. The pigments oxidation is responsible for tooth bleaching and can be carried out with two different products; carbamide peroxide and hydrogen peroxide. Usually the protocols for at-home bleaching include custom trays use and bleaching agents in lower concentrations. Carbamide peroxide is currently found in low concentrations for at-home technique and high concentrations for in-office technique are available. On the other hand, hydrogen peroxide was typically indicated in high concentrations for in-office bleaching but nowadays is available in low concentrations for at-home protocols. This paper describes clinical cases performed with bleaching systems and different techniques by the use of hydrogen and carbamide peroxide bleaching agents available in the market. The at-home vital bleaching was effective with 10% carbamide peroxide or with 6.5% hydrogen peroxide in polyethylene strips.
KEYWORDS: At-home bleaching. Dental bleaching. Carbamide peroxide. Hydrogen peroxide.

***RESUMO**: O clareamento dental oferece uma alternativa conservadora, simples e de baixo custo para melhorar e estética de pacientes com dentes escurecidos. As técnicas clareadoras consistem no tratamento em consultório, caseiro ou uma combinação de ambas. A reação de oxidação dos pigmentos pode ser obtida com a utilização do peróxido de hidrogênio ou de carbamida. O clareamento caseiro envolve o uso de moldeiras individuais e de baixas concentrações de agentes clareadores em baixas concentrações. O peróxido de carbamida é utilizado em baixas concentrações para o clareamento caseiro e em altas concentrações par o clareamento de consultório. Por outro lado, o peróxido de hidrogênio era somente indicado em altas concentrações para o clareamento de consultório porém atualmente também esta sendo utilizado em concentrações menores para o clareamento caseiro. Este trabalho descreve casos clínicos realizados com sistemas clareadores caseiros que empregam diferentes técnicas e agentes clareadores, o peróxido de carbamida e o de hidrogênio. O clareamento dental foi efetivo com o uso do peróxido de carbamida 10% em moldeira ou com o peróxido de hidrogênio 6.5% impregnado em fitas de polietileno.*
***PALAVRAS-CHAVE:** Clareamento caseiro. Clareamento de dente. Peróxido de carbamida. Peróxido de hidrogênio.*

INTRODUCTION

The dental professional must consider aesthetics and it is especially important when the patients have an increased interest to have perfect teeth and smile. The "bleaching" or "whitening" of teeth has an important role in this context. Christensen said that bleaching is a service aimed at improving patient appearance and self-esteem and has received unprecedented public interest and acceptance.[1] Discolored teeth are linked to oral diseases and patients desire white teeth.

McGrath et al[2] affirmed that within the past decade there has been an enormous increase in the availability and use of tooth whitening products among the public. There are several bleaching techniques available: at-home dental bleaching performed with custom trays, supervised by dentists, which contain 5.5-7.5% hydrogen peroxide or 10-20% carbamide peroxide; commercially available home bleach systems using standard trays, which contains up to 6% hydrogen peroxide and 10% carbamide peroxide; plastic strips systems as Crest Whitestrips which contains 5.5-10% hydrogen peroxide; in-office bleaching also known as power bleaching, which contain

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30-38% hydrogen peroxide or 35% carbamide peroxide (either alone or activated by heat or light); toothpastes with low concentrations of hydrogen peroxide or calcium peroxide; and also over-the-counter products with several delivery options, including custom-fit mouth trays, paint-on products, and film technologies[1,3,4].

Mass marketed products typically contain low levels of whitening agent (ranging 3-6% hydrogen peroxide) and it is self-applied to the teeth via gum shields, strips or paint-on product formats and require twice per day application for up to 2 weeks[5]. A recent study performed with a prototype bleaching strip containing hydrogen peroxide gel at 13% and 16% concentrations shows a tendency of higher bleaching effect with higher concentration levels[6].

Actually tooth whiteners systems can be tailored to fit the individual needs of the consumer. The most common and popular bleaching agent is carbamide peroxide, which, concentrated at 10%, releases 3.5% hydrogen peroxide used in tray. However, the disadvantages of the tray method are as follows: requires impressions and trays; may take 2-4 weeks; compliance is a problem and; not user friendly.

This paper describes two clinical cases that achieved aesthetics results of whitening tooth, focusing in the upper incisives and upper canines color weekly recording (7; 14, and 21days of treatment) including a post-treatment monitoration (7 and 14 days post-treatment).

CASE REPORT

Case 1: at-home vital bleaching with 10% carbamide peroxide (Whiteness Perfect)

A 21-year-old man reported to our clinic to bleach his teeth. The incisives were classified as B3 according to Vita scale (Zahnfabrik H. Rauter GmbH & Co. KG, Germany) and canines as A3.5 (Figure13). This discoloration could be easily removed, and an at-home bleaching with 10% carbamide peroxide was proposed and accepted by the patient.

Alginate impressions and study models were made. Each labial surface of tooth of model was blocked out to create a reservoir to bleaching gel, and a custom tray was vacuum formed. The tray was trimmed to minimize tissue contact and fitted to ensure patient comfort and eliminate any contact of the bleaching gel with the gingival tissue that might result in tissue irritation[11].

In the second appointment with the patient, the tray was positioned in the patient's mouth and tissue adaptation, retention, and occlusion were checked.

The patient was instructed to apply the bleaching material in one drop per tooth of 10% carbamide peroxide (Colgate Platinum Overnight – Colgate, Colgate Palmolive Ind. Com., Brazil) to the tray and insert each night at bedtime after brushing and flossing the teeth. The patient was advised to remove the excess of gel. One arch was treated at a time to preserve the opposing arch as a standard for latter color comparison.

The change in color was weekly monitored as described by Kugel et al[7] with a Vita scale until the desired level of color change was obtained. The same specialist in Operative Dentistry always evaluated the color according its brightness (Table 1).

Table 1: Vita shade tabs aligned according to brightness as recommended by the manufacture:

B1	A1	B2	D2	A2	C1	C2	D4	A3	D3	B3	A3,5	B4	C3	A4	C4
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Light ⇐ to ⇒ Dark

After 7 days of treatment, the color of incisives was classified as D2 and canines as C1 according to Vita scale; the upper arch had a visible contrast as reference to inferior (Figure 2). After 14 days of treatment, the incisives and canines color were classified as A1 (Figure 3), and after 21 days of treatment both incisives and canines were classified as B1 (Figure 4). After this period the treatment was considered complete for the upper arch. New evaluations were carried out 7 days post-treatment (Figure 5) and 14 post-treatment and the incisives color were classified as B1 and the canines B2 (Figure 6). After another 21 days period of bleaching at the inferior arch the treatment was considered complete and the results were satisfactory.

Figure 1 – Initial, Incisives: B3 and Canines: A3.5.

Figure 2 – 7 days of treatment with carbamide peroxide 10%, Incisives: D2 and Canines: C1.

Figure 3 – 14 days of treatment with carbamide peroxide 10%, Incisives: A1 and Canines: A1.

Figure 4 – 21 days of treatment with carbamide peroxide 10%, Incisives: B1 and Canines: B1.

Figure 5 – 7 days post-treatment with carbamide peroxide 10%, Incisives: B1 and Canines: B.

Figure 6 – 14 days post-treatment with carbamide peroxide 10%, Incisives: B1 and Canines: B2.

Case 2: Whitestrips bleaching with 6.5% hydrogen peroxide (Crest)

A 24-year-old man reported to our clinic with a desire for bleach his teeth. The upper incisives were classified as A3.5 according to Vita scale (Figure7) and canines were classified as A4. Whitestrips bleaching with 6.5% hydrogen peroxide was proposed and accepted by the patient. The plastic strips of the system (Crest White Strips, Proctor and Gamble Inc., Cincinnati, USA) were worn 30 minutes twice daily (morning and night) on the six maxillary anterior teeth. One arch was treated at a time to preserve the opposing arch as a standard for latter color comparison.

The change in color was weekly monitored until the desired level of color change was obtained. After 7 days of treatment, it was considered that bleaching was achieved and the incisives were classified as C1 and canines as D4 according to Vita scale, the upper arch had a visible contrast as reference and was bleached (Figure 8).

After 14 days of treatment, the incisives and canines color was classified as D2 (Figure 9), and after 21 days of treatment the incisives and canines color was classified as A1 according to Vita scale (Figure 10). After this period the treatment was considered complete for the upper arch. New evaluations were carried out 7 days post-treatment (Figure 11) and 14 post-treatment. The incisives color was classified as A1 and canines as A2 (Figure 12). After three weeks of bleaching at the inferior arch the treatment was considered complete and the final result was considered satisfactory.

Figure 9 – 14 days of treatment with polyethylene strip with 6.5% hydrogen peroxide, Incisives: D2 and Canines D2.

Figure 10 – 21 days of treatment with polyethylene strip with 6.5% hydrogen peroxide, Incisives: A1 and Canines: A1.

Figure 11 – 7 days post-treatment with polyethylene strip with 6.5% hydrogen peroxide, Incisives: A1 and Canines: A1.

Figure 12 – 14 days post-treatment with polyethylene strip with 6.5% hydrogen peroxide, Incisives: A1 and Canines: A2.

Figure 7 – Initial: Incisives: A3.5 and Canines: A4.

Figure 8 – 7 days of treatment with polyethylene strip with 6.5% hydrogen peroxide, Incisives: C1 and Canines: D4.

DISCUSSION

Color is described as three-dimensional entity of value, hue, and croma. Hue refers to actual color of the object, chroma refers to its saturation (intensity or strength), and value is associated with brightness[8]. Chroma is the degree of colour saturation and describes the strength, intensity or vividness of a colour[9]. Observed tooth color change is dependent on bleaching time, the initial tooth color, the specific tooth region, or the type of tooth being bleached[8].

Joiner said that hue is the attribute of a color that enables one to distinguish between families of different color, for example, red, blue and green. Value indicates the lightness of a color ranging from pure black to pure white[9].

Joiner et al[5] in a recent review of literature about bleaching of teeth affirmed that in-office bleaching uses higher levels of bleaching agent for shorter time periods. In this particular case soft tissues must be protected and the peroxide may be further activated by heat or light.

Myers et al[10] affirmed that the effectiveness of bleaching with 10% carbamide peroxide to produce a change in color is widely accepted. Their study concluded that the mean shade change of the active group at 2 weeks was 4.20 Vita shade tabs. The lightening effect was effectively maintained for 6 months[10]. Also, Alonso de la Pena & Balboa Cabrita[11] compared the clinical efficacy and safety of 10% carbamide peroxide and 3.5% hydrogen peroxide in at-home bleaching gels. They concluded that there were no differences in degree of bleaching.

In the present clinical case report, patients had at least 10 vita scale tabs change from a dark tab to a lighter tab. It can also be observed that the most notable shade lightening was achieved mainly in the first week of treatment. However, the one week use is effective by ADA Guidelines that considered effective more than 2 shade tabs change[12].

The choice for the at-home technique was based on its advantages obtaining by the high frequent use of a bleaching agent in low concentration. This use guarantees a more safe, fast, and effective treatment than in-office power bleaching technique. Jones et al demonstrated that the in-office bleaching technique protocol produced significant fewer desirable color changes than did two at-home bleaching protocols[8].

By the other side, the at-home and in-office techniques may be used in association to obtain faster results as showed by Deliperi et al[13] that compared a combined in-office (35 and 38% hydrogen peroxide) and at-home bleaching system (10% hydrogen peroxide). The hydrogen peroxide was applied during 30 minutes and the at-home protocol was performed during 60 minutes and it was repeated three consecutives days and an average shade rebound of two shades was recorded after one week.

No clinical differences were observed by the use a custom tray system or a plastic strip system for bleaching agent delivery. Donly et al reported significant whitening by polyethylene strips with 6.5% and 10% hydrogen peroxide gel and they were well-tolerated with adverse effects mild in severity[14]. Luo et al[15] found differences in the colour parameters and whiteness indices over the 2 week period that subjects used tooth whitening product of a strip coated with a gel containing 6% hydrogen peroxide on the facial surface of the anterior upper teeth. Microscopically, Duschner et al reported that bleaching treatment performed by polyethylene strips with 6% and 6.5% hydrogen peroxide gel does not produce changes in enamel surface[16].

Donly et al compared 10% polyethylene strips with 10% carbamide peroxide tray system. There were no significant differences between the two groups in any color parameters, both whitening systems were well tolerated, and most adverse events were mild in severity.[17]

Gerlach et al[18] evaluated the response of whitening strips to a low carbamide peroxide and potassium nitrate bleaching gel. Both treatments yielded a statistically significant whitening benefit with respect to reduction in yellowness and improvements in other color endpoints. Tooth sensitivity was reported by 13% of subjects using the hydrogen peroxide strips, compared to 22% of subjects using the carbamide peroxide potassium nitrate tray system. Shahidi et al[19] compared the clinical response of 10% hydrogen peroxide whitening strips (one week of treatment) and 6% hydrogen peroxide strip (two weeks of treatment). They concluded that both treatments were effective.

In addition, it should be emphasized that patients in present study showed an effective result by at-home bleaching technique with the classical at-home bleaching technique with a custom tray or with plastic strips with any clinical side effects.

Microscopically, some authors[4,20,21,22] pointed out controversial results in the effects of bleaching treatment on enamel surface but clinically bleaching technique is still the most conservative treatment to discolored teeth compared to facets and crowns.

By the results observed in the clinical report and supported by literature review it must be emphasized that if clinicians need to indicate dental bleaching, it would be prudent to use a system as efficacious as possible to achieve the patient expectations, however, with minimal side effects. So, clinicians need to consider that at-home bleaching technique is one of the best choices to obtain an effective result.

CONCLUSIONS

Nowadays tooth bleaching has grown in importance because of a growing interest of the patients and consumers of whitening products. The general practitioner must understand the differences of current available techniques (supervised nightguard bleaching, in-office bleaching and mass market products); the whitening solutions (carbamide and hydrogen peroxide) and its different concentration. The use of at-home systems is effective, easy, and safe and achieves effective results.

DISCLAIMER

The authors do not have personal interest in any commercial brand cited in this article.

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