Vital Tooth Bleaching: A Case Report

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Abstract: A dazzling white smile has been a symbol of beauty, health and vitality for hundreds of years. Discolouration, especially when the front teeth are affected, means a significant disturbance of aesthetics and can decrease a patient's self esteem. Public demand for aesthetic dentistry, including tooth whitening, has increased in recent years. Compared with restorative treatment modalities, whitening, also referred to as bleaching, is the most conservative treatment for discolored teeth. This public demand for a whiter smile and improved aesthetics has made tooth whitening a popular and often requested dental procedure, since it offers a conservative treatment option for discolored teeth. Whitening often enhances the treatment and encourages patients to seek further aesthetic treatment. 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. This case report reflects the remarkable change of tooth color by in-office bleaching.

Keywords: Vital bleaching, Hydrogen peroxide, Office bleaching.

I. INTRODUCTION

The first bleaching of teeth to change color was an in-office procedure. Currently, the most popular systems for in-office bleaching use high concentration hydrogen peroxides and are often referred to as "one-hour bleaching." These high concentration hydrogen peroxides range from 25% to 35%.

In-office bleaching can be provided to patients as either a one-visit 1–1.5 hour treatment or a multiple visit procedure [1-4].

One can use one of the light enhanced bleaching techniques, a laser-activated bleach or merely a paint-on bleaching gel or solution. For the in-office, light-enhanced systems, usually the light can only be used for bleaching. One light system is based on a plasma arc high-intensity photopolymerization device that can be used for in-office whitening and for resin photopoly-merization.

The use of high concentration hydrogen peroxide gelsintraorally requires specific safety protocols.

First, the doctor and patient must be wearing eye protection, and the gingival soft tissues adjacent to the procedure must have a barrier placed. Some lights generate heat and or UV rays, so a rubber dam napkin can be used to shield the face from the light source. In some cases, the manufacturers provide moisturizers for the lips or sunscreen as protection from the UV rays. Although a dental dam would be ideal, the placement of a dental dam will inhibit the bleaching of the cervical areas of the teeth, which will dissatisfy patients. Naturally, patients want their entire visible tooth surface to get whiter. The manufacturers have responded by providing barrier protection in the form of a light-cured resin that is painted over the gingival tissues.

i.i. Patient Selection

When treatment planning for successful esthetic treatment for tooth discolorations, it is important to select patients with conditions that have the best prognosis for success with bleaching.

Key factors that have an effect on the final result after bleaching include concentration of the bleaching agent, duration of use of the bleaching agent, type of tooth discoloration, color of the teeth, and patient's age [5].

It has been reported that tooth discolorations with the best prognosis for whitening are the followings:

1. Yellowing of the teeth without any systemic or developmental cause (food, smoking, aging, staining)
2. Mild flourosis staining
3. Mild tooth darkening due to trauma
4. Mild tetracycline staining [6-7]

Many dentists are using vital tooth bleaching as an adjunct to their esthetic bonding procedures. For

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patients dissatisfied with tooth mal position and shape combined with discolorations, lightening the shade of teeth first with bleaching makes masking tooth discolorations less difficult.

It is important that before any bonding procedure that bleaching be discontinued for at least one week before the restorative treatment to prevent interference with bonding adhesion and material setting [8-11].

II. CASE REPORT

A 25 years old female patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of discolouration of teeth.

During the examination of the patient, the key clinical parameters that are focused on are good periodontal health, no or minimal gingival recession and the absence of decay. Additionally, questions about any history of tooth sensitivity were asked. The importance of this is that patients with a history of tooth sensitivity occasionally experience mild to moderate tooth sensitivity for 24 hours after in-office bleaching. In the case of this patient, she had no history of any tooth sensitivity.

III. TREATMENT PROCEDURE

Pre-operative photos are taken (Figure **1**). The patient's initial shade is an A3, which is verified by a digital shade-taking device (Vita Easy shade Compact).

Figure 1: Pre-operative view.

For this patient, Pola Office was chosen (LOT NO. 122053) (Figure **2**). This material contains 35% hydrogen perioxide, which facilitates a significant whitening procedure with a start to finish time of less than an hour. The shorter treatment time and the inclusion of potassium nitrate in the composition, provides patients with less treatment and/or post-operative sensitivity than other in-office systems.

The teeth were cleaned with pumiceslurry. Teeth were dried, gingival barrier was applied and light cured in fanning motion. Then isolation was achieved with rubber dam (Figure **3**).

Figure 2: Pola Office Bleaching Kit.

Figure 3: Isolation with rubber dam.

With one Pola Office syringe, tip was firmly attached, and carefully plunger was pulled back to release the pressure. Contents of the syringe was carefully extruded into the pot and immediately mixed using a brush applicator until gel is homogeneous. A thick layer of gel was then applied to all teeth undergoing treatment (Figure **4**). The gel was left on teeth surfaces for 8 minutes (Figure **5**). Optional curing light can be used according to manufacturer's instructions (Figure **6**). Suction was performed using a surgical aspirator tip.

Figure 4: Application of the bleaching gel with the brush applicator.

Figure 5: Bleaching gel was left for 8 minutes.

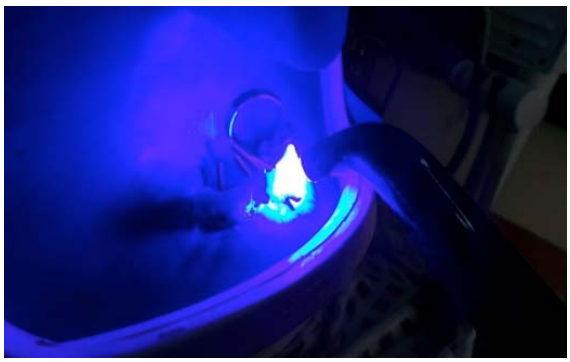

Figure 6: Photo activation of the bleaching gel.

Three applications were used to complete the in office procedure after the last application, all gel was suctioned, then washed with water. After the completion of the procedure, the rubber dam was removed (Figure **7**).

Figure 7: Post-operative view.

In this case, a bleaching LED curing light was used and this is a cost effective and easy to use light source for augmenting the in-office procedure.

The patient was asked to return in 10 days to evaluate the results. Using standard visual examination and confirmation with VITA Easy shade Advance (Figure **8**), a noticeable shade change has occurred. The postoperative shade is now an A1. Final polishing of the teeth was performed after the desired shade improvement (Figure **9**). The patient noticed a marked improvement and was very pleased with the final outcome.

Figure 8: VITA Easyshade Advance.

Figure 9: After final polishing.

Patient was recalled after 3 months for follow-up (Figure **10**).

Figure 10: 3 months follow up.

IV. DISCUSSION

With in-office bleaching, both proper isolation and protection of mucosal tissues are essential. Dentists may also wish to consider prescribing NSAIDs prior to treatment [12] since post-treatment sensitivity is unpredictable.

The treatment schedule may also be a useful method to help minimize tooth sensitivity. Multiple appointments are typically scheduled 1 week apart to allow sensitivity to abate.

A “bleaching light” is sometimes used with in-office bleaching procedures as well. Some reports suggest that pulpal temperature can increase with bleaching light use, depending on the light source and exposure time. An *in vitro* study suggests that use of some lights may result in light radiation exposure levels approaching or exceeding safety limits [13]. Pulpal irritation and tooth sensitivity may be higher with use of bleaching lights or heat application, and caution has been advised with their use [14,15].

There is conflicting evidence on the effects of bleaching lights on tooth color change. Most studies comparing effectiveness of in-office bleaching with or without light application were conducted *in vitro* [14]. The effects on tooth color change were variable, and some differences detected digitally were not detectable visually. This observation was reported in a recent clinical study report as well [16]. Of studies conducted *in vivo*, most found no added benefit for light-activated systems [14-17]. Heat and light application may initially increase whitening due to greater dehydration, which reverses with time. Actual color change will not be evident until 2 to 6 weeks after bleaching treatment.

The average number of in-office visits for maximum whitening is three [18] with a range of 1 to 6 visits, so the patient should be prepared for additional in-office treatments [19].

V. CONCLUSION

Vital tooth bleaching is an effective treatment modality that can significantly change the appearance of teeth. Patient satisfaction has been demonstrated after use of professionally dispensed bleaching treatment.

Based on the clinical results reported with professional vital tooth bleaching, it is a viable, esthetic treatment for the discolored dentition its conservative nature and little, if any, risk makes it an important part of an esthetic dentistry treatment plan.

In-office bleaching has gained a lot of popularity in the general public. Many patients are now aware that in-office bleaching is a procedure that many dentists offer and is a great way to get a fast and immediate change in the color of their teeth. In today’s world of immediate gratification, in-office bleaching is one of the most requested procedures in many dental offices.

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