

Case Report

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 of the front teeth means a significant disturbance of aesthetics and may decrease a patient's self esteem. Public demand for aesthetic dentistry, including tooth whitening, has increased in recent years. Dental bleaching offers a conservative, simplified, and low cost approach to change the color of discoloured teeth. 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 colour by in-office bleaching.

Key words: Vital bleaching, Hydrogen peroxide, office bleaching

Introduction

Dental bleaching, also known as tooth whitening, is a common procedure in general dentistry. According to the FDA, whitening restores natural tooth color and bleaching whitens beyond the natural color. There are many methods available, such as brushing, bleaching strips, bleaching pen, bleaching gel, and laser bleaching. Teeth whitening has become the most requested procedure in cosmetic dentistry today [1]. There are two main types of whitening procedures-Non-vital whitening which is done on a tooth that has had root-canal treatment and no longer has a live nerve, Vital whitening is performed on teeth that have live nerves. The most common type of vital tooth whitening uses a gel-like whitening solution that is applied directly to the tooth surface. This product contains some form of hydrogen peroxide [2], Vital bleaching is an in-office procedure and 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 of 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 photopolymerization.

The use of high concentration hydrogen peroxide gels intraorally requires specific safety protocols. First, the doctor and patient must wear eye protection, and the gingival soft tissues adjacent to the procedure must have a barrier placed. As some types of lights generate heat and or UV rays, a rubber dam napkin is used to shield the face from the light source. In some cases, the manufacturers provide moisturizers for the

lips or sun screen as protection from the UV rays. Although a dental dam would be ideal, the placement on 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.

Patient selection

For successful aesthetic vital tooth bleaching, it is important to select patients with conditions that have the best prognosis for successful 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 fluorosis 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 aesthetic bonding procedures. For patients dissatisfied with tooth malposition 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].

Case report

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



Figure- 1: Pre-operative view



Figure-3: Isolation with rubber dam

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 Easyshade Compact). For this patient, Pola Office was chosen (LOT NO. 122053,Figure-2).This material contains 35% hydrogen peroxide, which facilitates 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 was cleaned with pumice slurry. Teeth were dried, gingival barrier was applied and light cured in fanning motion, then isolation was achieved with rubber dam.(Figure-3). With one Pola Office syringe, tip was firmly attached, and carefully plunger was pulled back to release

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.



Figure-2: Pola Office Bleaching Kit



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

the pressure. Contents of the syringe was carefully extruded into the pot and immediately mixed using a brush applicator until gel turns 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 was used according to manufacturer's instructions (Figure.no.6), suction was performed using a surgical aspirator tip.

Three applications were used to complete the in-office procedure. After the last application, all the applied gel was suctioned, washed with water. After the completion of the procedure, the rubber dam was removed (Figure-7). In this case, a bleaching LED curing light was used as 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 EasyshadeAdvance (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).



Figure-5: Bleaching gel was left for 8 minutes



Figure-6: Photoactivation of the bleaching gel



Figure-7: Post-operative view



Figure-8: VITA Easyshade Advance

The patient noticed a marked improvement and was very pleased with the final outcome. Patient was recalled after 3 months for follow-up (Figure-10).

Discussion

While performing 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.



Figure-9: After final polishing



Figure-10: Three months follow up

The treatment schedule may also be a useful method to help minimize tooth sensitivity. Multiple appointments are typically scheduled one 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 as most of 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].

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, aesthetic treatment for the discolored dentition. Its conservative nature and little, if any, risk makes it an important part of an aesthetic dentistry treatment plan. In-office bleaching has gained a lot of popularity among 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.

Reference

1. Li Y. et al. Effect of Light Application on an In-Office Bleaching Gel. *J Dent Res.* 2001; 82 (Special Issue, AADR Abstracts): No. 895. 2003. http://en.wikipedia.org/wiki/Tooth_bleaching. <http://www.colgate.com/app/CP/US/EN/OC/Information/Articles/Cosmetic-Dentistry/Tooth-Whitening/Tooth-Whitening-Basics/article/Tooth-Whitening.cvsp>
2. Luk K, Tam L, Hubert M. Effect of light energy on peroxide tooth bleaching. *J Am Dent Assoc.* 2004;135 (2):194–201.
3. De Silva Gottardi M, Brackett MG, Haywood VB. Number of in-office light activated bleaching treatments needed to achieve patient satisfaction. *Quintessence Int.* 2006;37:115–120.
4. Tavares M, Stultz J, Newman M, Smith V, Kent R, Carpino E, Goodson JM. Light augments tooth whitening with peroxide. *J Am Dent Assoc.* 2003; 134:167–175.
5. Haywood VB. Nightguard vital bleaching: Current concepts and research. *J Am Dent Assoc.* 1997; 128:19–25.
6. Reinhart JW, Eivins SE, et al. A clinical study of nightguard vital bleaching. *Quintessence Int.* 1993; 24:379–384.

7. Russell CM, Dickinson GL, et al. Dentist supervised homebleaching with ten percent carbamide peroxide gel: A sixmonth study. *J Esthet Dent*. 1996; 8:177–182.
8. Godwin JM, Barghi N, Berry TG, et al. Time duration for dissipation of bleaching effects before enamel bonding. *J Dent Res*. 1992; 71:179.
9. Cvitko E, Denehy GE, Swift Jr EJ, et al. Bond strength of composite resin to enamel bleached with carbamide peroxide. *J Esthet Dent*. 1991; 3:100–102.
10. Machida S, Anderson MH, Bales DJ. Effect of a homebleaching agent on adhesion to enamel. *J Dent Res*. 1992;71:282.
11. Basting RT, Rodrigues JA, Serra MC, Pimenta LAF. Shearbond strength of enamel treated with seven carbamideperoxide bleaching agents. *J Esthet Restor Dent*. 2004;16:250–260.
12. Charakorn P, Cabanilla LL, Wagner WC, Poong WC, Shaheen J, Pregitzer R, Schneider D. The effect of preoperative ibuprofen on tooth sensitivity caused by in-office bleaching. *Oper Dent*. 2009; 34:131-135.
13. Bruzell EM, Johnsen B, Aalerud TN, Dahl JE, Christensen T. In vitro efficacy and risk for adverse effects of light-assisted tooth bleaching. *Photochem Photobiol Sci*. 2009; 8: 377-385.
14. Buchalla W, Attin T. External bleaching therapy with activation by heat, light or laser— a systematic review. *Dent Mater*. 2007;23: 586-596.
15. Baik JW, Rueggeberg FA, Liewehr FR. Effect of light-enhanced bleaching on in vitro surface and intrapulpal temperature rise. *J Esthet Restor Dent*. 2001; 13:370-378.
16. [16].Gurgan S, Cakir FY, Yazici E. Different light-activated in-office bleaching systems: a clinical evaluation. *Lasers Med Sci* 2010;25:817-22.
17. Kugel G, Papatthaniou A, Williams AJ, Anderson C, Ferreira S. Clinical evaluation of chemical and light-activated tooth whitening systems. *Compend Contin Educ Dent*. 2006;27:54-62.
18. Auschill TM, Hellwig E, Schmidale S, Sculean A, Arweiler NB. Efficacy, side-effects and patients' acceptance of different bleaching techniques (OTC, in-office, at-home). *Oper Dent*. 2005; 30:156-63.
19. Matis BA, Cochran MA, Wang G, Eckert GJ. A clinical evaluation of two in-office bleaching regimens with and without tray bleaching. *Oper Dent*. 2009; 34:142-149.