

## Aesthetic Management of Discolored Teeth by Vital Dental Bleaching: Case Reports

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### Abstract

Vital tooth bleaching is a valuable treatment modality that can significantly change the color and 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 hideous dentition. Its conservative nature and little, if any, risk makes it an important part of an aesthetic dentistry treatment. This case report presents two cases in which bleaching was done using Whiteness HP Maxx. Regular follow up of after a period of 4 weeks showed significant reduction of discoloration in teeth.

**Keywords:** Vital tooth bleaching; Aesthetic; Bleaching agents.

### Introduction

Today in this world of dream and desires, tooth aesthetics come into major consideration. Everybody wants a beautiful smile and a happy face. Discolored tooth becomes a matter of low self esteem, so to enhance their beauty we have done dental bleaching.

Dental bleaching is a common procedure in general dentistry which is also known as tooth whitening. According to the FDA, whitening restores the natural color of tooth while bleaching whitens beyond the natural color. It has been done by variety of methods such as brushing, bleaching pen, bleaching strips, bleaching gel, and also by laser bleaching. Teeth whitening has become the most requested procedure in cosmetic dentistry

today.<sup>1</sup> There are two main types of whitening procedures—Non-vital whitening which is done on a tooth that has had root-canal treatment; vital whitening is performed on vital teeth. Uses of bleaching gel like whitening solution is the most common type of vital tooth whitening which applied directly to the tooth surface. This product contains forms of hydrogen peroxide.<sup>2</sup> Vital bleaching is an in-office procedure and one of the most popular systems. They use high concentration hydrogen peroxides (25%–35%) and are often referred to as “one-hour bleaching”. In-office bleaching can be provided to patients as either in one-visit procedure of 1–1.5 hour treatment or a multiple visit procedure.<sup>1-4</sup> One can use one of the light enhanced bleaching techniques, a laser activated bleach or merely a paint-on bleaching gel



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or solution. One light system is based on a plasma arc high-intensity photo polymerization device that can be used for in-office whitening and for resin photo polymerization.

### *Patient Selection*

For successful aesthetic vital tooth bleaching, it is important to select patients with conditions that have the best prognosis for successful bleaching. The basic strategy behind this is that the effects 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.<sup>5</sup> It has been reported that tooth discolorations with the best prognosis for whitening are the following:

1. Without any systemic or developmental cause such as food, smoking, aging, staining, there is yellowish of teeth
2. Mild fluorosis staining
3. Mild tooth darkening due to trauma
4. Mild tetracycline staining<sup>6,7</sup>

In aesthetic dentistry, many dentists are using vital tooth bleaching which is adjunct to their aesthetic bonding procedures. For patients who are dissatisfied with tooth malposition and shape combined with discolorations, lightening the shade of teeth first with bleaching makes masking tooth discolorations less difficult. To prevent any interference with bonding adhesion and material setting it is important that bleaching should be discontinued for at least one week before the restorative treatment.<sup>8-11</sup>

### **Case Report**

#### *Case 1*

A 29-year-old male patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of yellowing of teeth despite of having good oral hygiene. 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 but patient have tetracycline staining. 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 present case, patient had no history of any tooth sensitivity.

### *Treatment Procedure*

Preoperative photos are taken (Fig. 1). The patient's initial shade is A3, which is verified by a shade taking device. For this patient, Whiteness HP Maxx was chosen. This material contains 35% hydrogen peroxide, which facilitates significant whitening procedure with a start to finish time of less than an hour. It has two phase presentation which allows it to have a better product shelf life (2 years). It has the composition of heat blocker which minimizes the sensitivity that can be caused by accelerating sources. It comes with an enzymatic solution (Neutralize) container which is used when an accidental contact of the peroxide with the patient's mucosa happens. It can be used with or without source of acceleration. The teeth was cleaned with pumice slurry and then desensitizing toothpaste was applied for 15 min. Isolation was done with Top dam-light-curing gingival protector (FGM) covering the marginal gum and the buds with a 3 to 5 mm wide and 1 mm max thickness (Fig. 2). Top dam resin (FGM) was cured using 20 to 30 seconds light-curing for each group of three teeth. Then the Peroxide phase (Phase 1) was mixed with the thickener phase (Phase 2) in the following proportion: 3 drops of peroxide to 1 drop of thickener. This mix quantity is adequate for application of one tooth. For the smile line (10 teeth), normally 21 drops of peroxide and 7 drops of thickener are enough. With the help of a brush or spatula, vestibular surface of the teeth to be whitened was covered, including the interproximal surfaces and extended a little on the incisal and occlusal surfaces (Fig. 3). The thickness of gel layer should be between 0.5 mm and 1 mm. To accelerate the process, the application of light was done right after the application of gel for 20 seconds on each tooth alternately (generally from pre-molar to pre-molar), maintaining a distance of 5 to 10 mm from the surface of the gel and it should be try to done as twice time for each gel application. The gel was left on the dental surface for at least 15 minutes from the beginning of the application through the end (Fig. 4). With the help of a brush or micro applicator, the gel was moved over the teeth three or four times to eliminate possible oxygen bubbles that might have formed and renew the best contact possible of the gel with the teeth. At the end of treatment, the gel was cleaned through suction and the teeth were washed. The gingival protector removed with the probe. The Desensibilize KF 2% (FGM) was applied for 10 minutes and right after that, the teeth were polished with polishing paste Diamond Excel (FGM) and felt disks Diamond (FGM) or Diamond Flex (FGM). Four applications

were used to complete the in-office procedure with a one week gap between them.

The patient was asked to return after each week to evaluate the results. Using standard visual examination and confirmation with shade guide, a noticeable shade change occurred. The

postoperative shade after 4 week is A1. Final polishing of the teeth was performed after the desired shade improvement. The patient noticed a marked improvement and was very pleased with the final outcome (Fig. 5). Patient was recalled after 3 months for follow-up and results were stable.



Fig. 1: Preoperative.



Fig. 2: Gingival barrier placed.



Fig. 3: Bleaching agent placed.



Fig. 4: Color change indicator.



Fig. 5: Postoperative.

### Case 2

In this case there was visible yellow stains was present in a 25-year-old male patient due to

fluorosis (Fig. 6). Same procedure was repeated (Fig. 7-9). After 4 weeks of bleaching, these yellow stains lightening were seen up to a considerable degree (Fig. 10).





Fig. 6: Preoperative photograph of Case 2.



Fig. 7: Gingival barrier placed.



Fig. 8: Bleaching agent placed.



Fig. 9: Color change indicator.



Fig. 10: Postoperative.

## Discussion

While performing in-office bleaching procedure, there should be effective isolation and protection of oral mucosal tissues. 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 for 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 have

desire to get whiter in their entire visible tooth surface. The manufacturers have responded by providing barrier protection in the form of a light cured resin that is painted over the gingival tissues.

The appointment 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. Sometimes we use a "bleaching light" for in-office bleaching procedures. Some reports suggest that pulpal temperature can increase with the use of bleaching light, which depends 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.<sup>12</sup> With the use of bleaching lights or heat application

there are more chances of pulpal irritation and tooth sensitivity and caution has been advised with their use.<sup>13,14</sup> There are many in vitro studies conducted which compares the effectiveness of in-office bleaching with or without light application which provides conflicting evidence on the effects of bleaching lights on tooth color change.<sup>13</sup> There were variable results regarding the tooth color change, in which there were some differences which were detected digitally but not detectable visually. This observation was reported in a recent clinical study report as well.<sup>15</sup> In most vivo studies, they found no added benefit for light activated systems.<sup>13-16</sup> It is seen that 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. On an average, the number of in-office visits for maximum whitening is three,<sup>17</sup> with a range of 1 to 6 visits, so the patient should be prepared for additional in-office treatments.<sup>18</sup>

## Conclusion

Vital tooth bleaching is a valuable treatment modality that can significantly change the aesthetic 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 hideous dentition. Its conservative nature and little, if any, risk makes it an important part of aesthetic dentistry treatment modality. So in today's world of immediate gratification, in-office bleaching is one of the most requested procedures performed in dental offices.

## References

1. Li Y, et al. Effect of Light Application on an In-Office Bleaching Gel. *J Dent Res*. 2003;82(Special Issue, AADR Abstracts):895.
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;37:115-20.
4. Tavares M, Stultz J, Newman M, et al. Light augments tooth whitening with peroxide. *J Am Dent Assoc*. 2003;134:167-75.
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;24:379-84.
7. Russell CM, Dickinson GL, et al. Dentist supervised homebleaching with ten percent carbamide peroxide gel: A six month study. *J Esthet Dent*. 1996;8:177-82.
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 home bleaching agent on adhesion to enamel. *J Dent Res*. 1992;71:282.
11. Basting RT, Rodrigues JA, Serra MC, et al. Shearbond strength of enamel treated with seven carbamide peroxide bleaching agents. *J Esthet Restor Dent*. 2004;16:250-60.
12. Bruzell EM, Johnsen B, Aalerud TN, et al. In vitro efficacy and risk for adverse effects of light-assisted tooth bleaching. *Photochem Photobiol Sci*. 2009;8:377-85.
13. Buchalla W, Attin T. External bleaching therapy with activation by heat, light or laser: A systematic review. *Dent Mater*. 2007;23:586-96.
14. Baik JW, Rueggeberg FA, Liewehr FR. Effect of light-enhanced bleaching on in vitro surface and intrapulpal temperature rise. *J Esthet Restor Dent*. 2001;13:370-78.
15. Gurgan S, Cakir FY, Yazici E. Different light-activated in-office bleaching systems: a clinical evaluation. *Lasers Med Sci* 2010;25:817-22.
16. Kugel G, Papatthanasiou A, Williams AJ, et al. Clinical evaluation of chemical and light-activated tooth whitening systems. *Compend Contin Educ Dent*. 2006;27:54-62.
17. Auschill TM, Hellwig E, Schmidale S, et al. Efficacy, side-effects and patients' acceptance of different bleaching techniques (OTC, in-office, at-home). *Oper Dent*. 2005;30:156-63.
18. Matis BA, Cochran MA, Wang G, et al. A clinical evaluation of two in-office bleaching regimens with and without tray bleaching. *Oper Dent*. 2009;34:142-49.