

In Office teeth bleaching: A case report

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Abstract

An array of treatment options is available for today’s dentists to reconcile a smile with discolored vital teeth. The treatment options available ranges from invasive options such as full crowns, veneers, direct restorations to minimally invasive options such as microabrasion, macroabrasion, and bleaching. The most non-invasive and conservative treatment option is **bleaching of teeth**, hence gaining wider acceptance. The aim of this case report is to describe the case of **in-office vital tooth bleaching** using Opalescence Boost (40% hydrogen peroxide gel) in young patient. The results were satisfactory by the end of 3rd visit with comfort and no side effects.

Keywords: Discoloration, Vital bleaching, In office bleaching, Gingival barrier, Opalescence Boost.

Introduction

Aesthetic dentistry is a field of dentistry concerned especially with the appearance of the dentition as achieved through its arrangement, form and color. The demand for aesthetic dentistry has increased continuously and the smile has become an integral part of social attractiveness of a person.^[1] Discoloration, especially when the front teeth are affected, means a significant disturbance of aesthetics and can decrease a patient’s self-esteem. ^[2] The spectrum of treatment ranges from invasive options such as crowns, veneers, and placement of direct restorations to minimally

invasive therapies such as macroabrasion, microabrasion, and bleaching to merely prophylaxis.^[3]

Tooth bleaching is one of the most conservative and cost-effective dental treatments to enhance a person's smile.^[4] Bleaching of vital teeth in the dental office involves the application of bleaching agents, usually 30 to 35% hydrogen peroxide often in combination with heat and light.

Hydrogen peroxide is an oxidizing agent that, as it diffuses into the tooth, dissociates to produce unstable free radicals which are hydroxyl radicals (HO^{*}), perhydroxyl radicals (HOO^{*}), perhydroxyl anions (HOO⁻), and superoxide anions (OO^{*-}), which will attack organic pigmented molecules in the spaces between the inorganic salts in tooth enamel by attacking double bonds of chromophore molecules within tooth tissues.^[5]

The following case report describes the case selection, criteria and requirements for a favorable outcome of management of vital discolored teeth using in office teeth bleaching as a treatment modality.

Case Report

A 21-year-old female with favorable oral health had reported to the department of Conservative Dentistry and Endodontics with a chief complaint of discoloration of upper anterior teeth.

On clinical examination, moderate yellowish bands of discoloration were observed, following which the patient was reviewed with the options and details involving bleaching. At the conclusion the patient felt that in-office bleaching would meet her needs.

Primarily, electric pulp testing was performed for the maxillary anterior teeth and all the teeth were found to be vital. Radiographic examination was also carried out for the same teeth to check for the presence of periapical pathologies. No periapical radiolucency was

present in the respective teeth. Additionally, the patient gave no history of tooth sensitivity. For a better accuracy, photography is used as a resource to control the shade progression as seen in the following images. Oral prophylaxis and polishing were carried out before starting the bleaching procedure.

A self-supporting cheek retractor was placed in the patient's mouth. The luer lock cap from the Opal Dam resin barrier syringe was removed and a tip was attached securely to the syringe. The teeth and gums were rinsed and air dried thoroughly.

The Opal dam barrier was dispensed along the gingival margin at a continuous speed overlapping approximately 0.5mm onto the enamel. The resin was light cured for 20 seconds in a scanning motion.

Before mixing the Opalescence Boost the red syringe was securely attached to the clear syringe. The small clear plunger was pressed into the middle small clear syringe to rupture the internal membrane and to combine the whitening gel and the activator. The red plunger was pressed completely back into the clear syringe to thoroughly mix the activator with the whitening gel. The stems were pushed back and forth continuously using thumbs. This was done a minimum for about 50 times rapidly (25 times each side). The entire mixed gel was pressed into the red syringe. The two syringes were then separated and a tip was attached to the red syringe. A 0.5- 1mm thick layer of the gel was applied on the labial surface of the maxillary anterior teeth. The gel remained on the teeth for 20 minutes and saliva was suctioned periodically as needed. The gel was then suctioned back following which the teeth were thoroughly rinsed. The Opal Dam resin barrier was removed.

The patient was recalled twice with an interval of 7 days and the procedure was repeated. The patient was

asked to return in 10 days to evaluate the results. Using standard visual examination, the shade change was evaluated. A noticeable shade change had occurred. The patient noticed a marked improvement with comfort and was very ecstatic with the final outcome.



Figure 1: Pre- operative



Figure 2: Gingival Dam and bleaching gel applied



Figure 3: After 1st visit



Figure 4: After 2nd visit



Figure 5: After 3rd visit

Discussion

In- office teeth whitening is one of the most inexpensive and simplest ways of transforming smile. Various brands of bleaching agents are currently available in the market. Here in this case Opalescence Boost was used and it had a favorable outcome. The 40% hydrogen peroxide formula penetrates the tooth enamel to break apart discolored molecules. As the oxygen molecules spread, the tooth whitens.

The Opalescence tooth whitening system differs from other in- office bleaching methods. Primarily, the active ingredients in Opalescence Boost are chemically activated, which means no lights are needed. Pulpal irritation and tooth sensitivity may be higher with the use of bleaching lights or heat application, and caution has been advised with their use.^[6] Kugel G, Papathanasiou A et al.^[7] showed that the use of light did not demonstrate any benefit over the chemically activated tooth whitening systems after a 2-week recall. Hein DK, Ploeger BJ et al.^[8] conducted a study indicating all three systems tested lightened 83 contralateral pair of anterior teeth to nearly the same degree of 1.6 to 1.8 combined value chroma with or without the use of accessory lights. Secondly, the whitening gel contains potassium nitrate and fluoride (PF) providing a more comfortable experience while helping to improve oral health. Potassium nitrate helps relieve sensitivity fast and usually has an effect that lasts for 24 hours whereas fluoride provides lasting

relief from sensitivity by increasing the hardness of enamel. More than twenty percent water content prevents dehydration and shade relapse.

Before commencing bleaching procedure, proper clinical evaluation and history taking is very important to understand patient's lifestyle, current levels of tooth sensitivity, the type of discoloration, baseline shade of the teeth, and time available for bleaching. Nonvital and traumatic tooth usually looks discolored hence before bleaching procedure electric pulp testing should be done to avoid misdiagnosis and wrong treatment.^[9] Dentists may also wish to consider prescribing NSAIDs prior to treatment since post-treatment sensitivity is unpredictable.^[10]

The incisors present a thinner structure which facilitates the penetration of the gel and its chemical reaction.^[11]

The patient age is also favorable as young teeth would favor ionic diffusion of the bleaching agent through dentin, increasing the chemical reaction.^[11] As both isolation and mucosal tissue protection are essential, we have followed the same in the above case. No diet restrictions were recommended during the bleaching procedure. Recent in vivo and in situ studies indicate that consuming food and drinks containing high levels of pigment is irrelevant to dental bleaching results.^[12]

Hanks et al. concluded that bleaching agent penetration into pulp chamber depends on the original concentration of the bleaching agent and duration for which it has been exposed to the tooth surface, he also concluded that it took around 15 mins for bleaching agent to reach into the pulp chamber. As molecular size and weight of peroxide molecule is very low and has the ability to denature the protein present in dentin, that is why it moves easily through dentinal tubules and reaches the pulp chamber. However, in- vivo studies by Cohen and Robertson shows either no or very minimal

inflammation of pulp when exposed to 35% H₂O₂. The protective mechanism of pulp against bleaching agent is by breakdown of peroxide molecule by enzyme peroxidase and catalase.^[9] Another factor responsible for the diffusion of bleaching molecule into the pulp chamber is positive pressure within the pulp chamber and osmotic pressure of the bleaching agent.^[13]

Conclusion

Dental bleaching can be predictable, comfortable and safe with satisfying results provided it is performed correctly.^[11] As per evolution of bleaching materials into the field of dentistry, in office bleaching is safe and fastest procedure for tooth whitening. In-office bleach is a viable, esthetic treatment option for an immediate effect on discolored teeth. A careful monitoring and supervision is critical for achieving a successful and safe tooth whitening outcome.^[3]

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