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In office vital bleaching: A case report

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Abstract
A pleasing appearance and bright smile greatly enhance one's personality. Discoloration, especially when the anterior teeth are affected, puts a significant disturbance of aesthetics and can decrease patient's self esteem. Public demand for esthetic dentistry, including tooth whitening especially anterior teeth has increased in recent years. Discoloration of a tooth is a common esthetic problem caused by either extrinsic or intrinsic factor. Now a days there are many advances for treating such teeth discolorations. The case report shows the remarkable change in the color of discolored teeth using in office bleaching.

Keywords: Discolored teeth, esthetics, vital, in office bleaching

Introduction
The normal color of permanent teeth is grayish yellow, grayish white, or yellowish white. Alterations or changes in the color may be physiologic or pathologic and endogenous or exogenous in nature [1, 7]. The color of teeth is determined by the translucency and thickness of the enamel, the thickness and color of the underlying dentin, and the color of the pulp [7]. Tooth color reveals many things such as people's oral health, good and bad habits and their age, etc. [2]
There are many reasons for teeth discolorations proper clinical evaluation and history taking is important to know the etiology responsible for tooth discoloration and the degree of discoloration [3]. Tooth discoloration is seen due to extrinsic or intrinsic stains. The most non invasive and conservative treatment for these stains is tooth bleaching [4]. Tooth whitening became one of the mostly used and performed cosmetic dentistry procedures [2].
There are several methods available such as brushing, bleaching strips, bleaching pen, bleaching gel and laser bleaching [5]. 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% [6].
The case presented in this article shows technique for In Office Vital tooth bleaching.

Case report
A 30 year old male patient with chief complaint of dark brown teeth reported to the department of Conservative Dentistry and Endodontics and desired to get the teeth to be treated for esthetic purpose. Patient gave history of discolored teeth since childhood. Also gave history of same problem with elder brother. On clinical examination brownish discoloration of upper anterior and premolar teeth was seen, except 11 and 21. The discoloration was almost on entire crown. Ellis Class 1 fracture was seen with 21.
Tooth vitality was carried out by using electronic pulp vitality tester for maxillary anterior teeth, and all teeth were found to be vital. Oral prophylaxis was done and teeth color remained unchanged.
After taking patient's history, clinical examination and oral prophylaxis, a diagnosis of dental fluorosis was established. In office vital tooth bleaching for upper anterior teeth was decided as treatment plan for the patient.

Treatment plan and procedure

Clinical photographs were taken before starting the procedure. The teeth to be treated were cleaned and dried. Liquid Dam (Gingival barrier) was applied and cured for gingival protection and isolation.

For this patient, Pola Office was chosen as bleaching agent. Equal part of bleaching gel and powder was taken and mixed until thick homogeneous mixture was formed and applied over teeth using applicator tip. Agent was not applied on 11 and 21 as patient was not concern about these teeth. Photo curing of bleaching agent was done using bleaching light unit for 8 min. Three cycles of 8 minutes were performed in the same appointment. Then bleaching agent was removed using air water syringe and suctioned then the final polishing was done with fluoride toothpaste and rubber cups. Afterwards composite resin restoration was done with 21.

Postoperative clinical photographs were taken and patient was discharged after giving postoperative instructions. The patient was recalled after 1 week for evaluation of result. Patient noticed marked improvement in tooth color & patient was satisfied with final result.

Preoperative Clinical Photograph

Application of Liquid Dam

Curing of Liquid Dam

Pola Office Bleaching Kit

Application of bleaching agent

Activation of bleaching agent using light

Postoperative appearance after bleaching and composite resin with 21

Preoperative mesial view

Postoperative mesial view

Preoperative distal view

Postoperative distal view

Preoperative labial view

Postoperative labial view

Discussion

Bleaching may be defined as the lightening of the color of the tooth through the application of a chemical agent to oxidize the organic pigmentation in the tooth. The goal of bleaching procedure is the restoration of normal color of a tooth by decolorizing the stain with a powerful oxidizing agent known as bleaching agent [7].

Bleaching procedure can be indicated in almost all of the conditions where tooth discoloration occurs, such as: decomposition of the pulp tissue, internal hemorrhage, trauma cases, use of medicines and systemic conditions such as: fluorosis, jaundice and fetal erythroblastosis [1]. Main contraindications of bleaching procedure are: application in pregnant women, infants, children under 10 years of age, patients who have teeth with exposed dentinal tubules and individuals who cannot quit smoking during the treatment period, patients having severe sensitivity with same teeth [1].

Regardless of the use of bleaching technique or product, the mechanism of action of bleaching agents is based on the release of active forms of oxygen, as a function of the interaction of hydrogen peroxide with tooth structure [7]. Hydrogen peroxide is an oxidizing agent capable of producing free radicals, releasing oxygen (O_2), reducing the complex carbonic chain of the pigment (which absorbs the blue spectrum of light), into smaller molecules with free hydroxyls (which do not absorb blue light) and so reflect the blue light along with the green and red spectra; this color mixture gives the whitening effect [1, 7].

Higher concentrations of Hydrogen peroxide (25–40%) are used in the clinics to achieve faster tooth lightening. In-office bleach, with its immediate positive outcome, can kick-start a home bleaching regimen. It overcomes the problems of patient compliance, manual dexterity and is also ideal for those patients with high gag reflex [8]. Hydrogen peroxide is potent in the first 30 min of mixing, after which the free radicals are depleted. Depending on the manufacturers' instructions, products are applied in 2-3 mm thickness on the labial surfaces of the teeth [8].

While performing in-office bleaching, both isolation and protection of mucosal tissues are essential. A "bleaching light" is used with in-office bleaching [5]. For isolation and protection of gingival tissues gingival barrier also called liquid dam is used.

There are many factors known to increase sensitivity such as high concentration of H_2O_2, high permeability of enamel, prolonged use of the bleaching agents, heat during the application of accelerator LED light and differences in the structural morphology of enamel and dentin with pores which facilitate the infiltration of bleaching agent. Sensitivity issues have led some manufacturers to release bleaching gels with lower concentrations of H_2O_2 and desensitizing agent in order to minimize the side effects produced by the peroxide radicals [3]. Here in this case Pola office bleaching kit was used and it has the most promising outcome. Along with 35% hydrogen peroxide Pola office also consist of potassium nitrate, so patients post operative sensitivity got reduced [1, 3]. 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 in treatment [4].

In vivo studies by Cohen and Robertson shows either no or very minimal inflammation of pulp when exposed to 35% hydrogen peroxide. The protective mechanism of pulp against bleaching agent is by breakdown of the peroxide molecule by enzyme peroxidase and catalase [4]. A "bleaching light" is 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 [6].

Patients are recommended to use a desensitizing toothpaste and dental floss with a powered toothbrush. Food, beverages, and habits that stain the teeth should be avoided. Depending on the relapse, the touch up or follow up is recommended in 6 months or after a year or two [8]. To avoid discomfort along with the treatment, such as avoiding too hot as well as too cold foods and beverages, low pH foods and beverages, stop smoking and every activity that can hyper stimulate sensitivity of teeth [2].

Conclusion

Vital tooth bleaching is an effective and quick treatment modality that can significantly change the appearance of teeth. For the mild to moderate teeth discolorations in office vital teeth bleaching is a good and safe choice for dentists when used in proper concentration of agent.

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