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Vital tooth bleaching : A case report

ABSTRACT:
Nothing could be more desirable than a sparkling white smile. A shining, beautiful smile has been a symbol of health & vitality since the centenary. Discoloration of a tooth is a common esthetic problem caused by either extrinsic or intrinsic factor. The normal color of tooth can be re-established by decolorizing the stain with the powerful oxidizing agent such as 35 percent hydrogen peroxide, which is directly placed on the labial surface of the tooth to be treated. Dental bleaching offers a conservative & simplified approach to change the color of discolored teeth. This case report reflects the remarkable change of tooth color by in-office bleaching.

Key words: Vital bleaching, Hydrogen peroxide, In-office bleaching

Introduction :

Dental bleaching, also called tooth whitening is a common procedure in dentistry. According to the FDA ,whitening restored natural tooth color and bleaching whitens beyond the natural color. There are several methods available such as brushing, bleaching strips, bleaching pen, bleaching gel and laser bleaching. Teeth whitening has become the most requested procedure in dentistry today[1].Thereare two main types of bleaching procedures, non-vital bleaching is done in a tooth which is root canal treated and has no nerve innervations. Vital bleaching is performed in a tooth which has live nerves. The most common type of vital tooth whitening uses a gel-like whitening solution, applied directly on the tooth surface like hydrogen peroxide, sodium perborate, carbamide peroxide followed by heating up of gel[2].Vital bleaching is an in-office procedure and most popular system for in-office bleaching use a high concentration of hydrogen peroxide are often referred to as "one-hour bleaching".These high concentrations of hydrogen peroxide range from 25%-35%. In-office bleaching can be provided to the patients as either a one visit of 1-1.5 hour treatment or multiple visit procedures[1-4].

Tooth Discoloration-classification:

1. By Abbot 1997
   - Extrinsic
   - Intrinsic
   - Combination of both
2. Extrinsic stains further classified by Nathoo & Gaffar (1995)z

- N1-type dental stain(direct dental stain).The chromogen binds to the tooth surface to cause discoloration e.g. stains caused by tea, coffee and wine.
- N2-type dental stain(direct dental stains).The chromogen changes color after binding to the tooth. e.g. age-related formation of yellowish discoloration on the interproximal or gingival areas.
- N3-type(indirect dental stains).The pre chromogen binds to the tooth surface and undergoes a chemical reaction to cause a stain.e.g. browning of teeth by cooking oils or therapeutic agents containing stannous fluoride.

History:

Firstly, Chloride and acetic acid were used as a bleaching agentin 1860 by Truman; he had used these agents for non-vital teeth. Then, Harlan (1884) used hydrogen peroxide for all

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discoloration for the first time. Pearson(1958) used 35%H2O2 inside the tooth and 25% H2O2 and 75% other activated by the lamp. Haywood and Heymann (1989) proposed night guard vital bleaching for all stains. Garber and Goldstein(1991) suggested the combination of bleaching techniques (power & home).

Mechanism:

he bleaching process is a result of oxidation and reduction reactions commonly known as 'Redox Reaction'. Free radicals with unpaired electrons are present in oxidizing agent,which it gives up and thus become reduced (eg.hydrogen peroxide) whereas the tooth surface which is being bleached acts as reducing agent by accepting the electrons.

Case Report

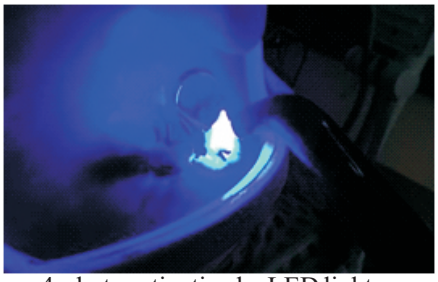
A 25 years old male patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of discolouration of teeth. During the oral examination of the patient, the key clinical guidelines that are focused on are no or minimal gingival recession, good periodontal health, and the absence of caries. In addition, 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, he had no history of any tooth sensitivity.

Figure-1-pre-operative photograph

Figure-2- pola office bleaching kit

Figure-3- placement of gingival barrie Figure-



4-photo activation by LED light

Treatment Procedure:

Pre-operative photos are taken (Figure- 1).The patient's initial shade is an A3, which is confirmed by a digital shade taking device (Vita Easy shade Compact). For this patient, Pola Office was selected (Figure-2).This material contains 35% hydrogen peroxide, which promotes remarkable whitening procedure with a start to finish time of less than an hour. The reduced treatment time and the incorporation of potassium nitrate in the composition give patients with less treatment and post-operative sensitivity than others in- office systems. The teeth were washed with pumice slurry. Teeth were dried, gingival barrier was applied and light-cured in a fanning motion, then isolation was achieved(Figure-3). With one Pola Office syringe, the tip was firmly attached, and carefully plunger was pulled back to release the pressure. Contents of the syringe were carefully extruded into the pot and immediately mixed using a brush applicator until the gel turns homogeneous. A thick layer of gel was then applied to all teeth undergoing treatment. The gel was left on teeth surfaces for 8 minutes. Optional curing light was used according to manufacturer's instructions (Figure. no. 4), suction was performed using a surgical aspiratortip.

Figure-5-post operative photograph

Figure-6-VITA Easyshade Advance

Three applications were used to complete the in-office procedure. After the last application, all the applied gel was suctioned, washed with water. The procedure was completed. 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 Easy shade Advance (Figure-6), 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-7).

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

Figure-7-After final polishing

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.

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 the 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 the studies comparing the 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. The 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 efficient treatment procedure that can appreciably change the appearance of teeth. Patient satisfaction has been demonstrated after the 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 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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