

In Office Philips Zoom Light Activated Bleaching: A Case Report

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Abstract

Tooth bleaching is defined as, “Any process that makes tooth appear whiter“. Intrinsic color of tooth & extrinsic stains are collectively responsible for tooth color. Dentine has major role in intrinsic tooth color because of properties like light scattering & adsorption. Bleaching gives quick results but post-operative sensitivity is addressed by use of potassium nitrate & fluorides. It has disadvantages such as costly, unpredicted result, might require multiple visits depending upon age of patient & etiology of stain. Hydrogen peroxide is most commonly used bleaching agent since decades. Its various formulations have shown successful review Mechanism of action of hydrogen peroxide on tooth bleaching is diffusion of free radicals produced via enamel & dentine which interact with the pigment & cause whitening effect. Philips tooth whitening plus uses blue LED light which is clinically

proven to be in conjugation with 6% hydrogen peroxide and has better results than hydrogen peroxide alone. The blue light LED provides 3 intensities from low, moderate, high in a 45 min cycle where we can switch from higher to lower & vice versa intensity depending upon patients reaction. The kit also contains vitamin E, liquid dam gingival barrier, napkin and eye protection wear.

Keywords: Philips zoom plus tooth whitening, hydrogen peroxide, in office bleach, conservative esthetic, fluorosis, stains.

Introduction

The self-awareness about facial esthetics is growing with time & giving rise to importance of bleaching or tooth whitening. Tooth whitening can be done effectively in patient without any major morphological changes & procedures. Though it cannot make a complete color change but can definitely change the hue & chroma

without any major invasive procedure. Tooth bleaching is defined as, “Any process that makes tooth appear whiter“.

Intrinsic color of tooth & extrinsic stains are collectively responsible for tooth color. Dentine has major role in intrinsic tooth color because of properties like light scattering & adsorption. Extrinsic stains are formed in non-self-cleansing area of teeth in addition to habits like tobacco in smokeless or smoke form & caffeine. Well extrinsic stains can be removed by scaling, micro abrasion, veneers etc. intrinsic stains requiring least invasive procedure includes bleaching. Intrinsic stains can be due to hereditary, medications, trauma, excess fluoride, high fever associated in early childhood.

Bleaching gives quick results but post-operative sensitivity is addressed by use of potassium nitrate & fluorides. It's an expensive technique and might require multiple visits depending upon age of patient & etiology of stain.

Mechanism of action of hydrogen peroxide on tooth bleaching is diffusion of free radicals produced via enamel & dentine which inter act with the pigment & cause whitening effect. The free radicals break down the double bond between the pigment molecules & change its configuration giving rise to change in optical properties of tooth & tooth appears whiter. Philips tooth whitening plus uses blue LED light which is clinically proven to be in conjugation with 6% hydrogen peroxide and has better results than hydrogen peroxide alone. The blue light LED provides 3 intensities from low, moderate, high in a 45 min cycle where we can switch from higher to lower & vice versa intensity depending upon patients reaction. Along with eye guard, liquid dam, mouth guard even ACP gel is provided to address post treatment sensitivity.

Final outcome always depends on patient's age, expectations, etiology, original shade, concentration & method of bleaching.

Case Report

A 35 year old male patient visited the Department of Conservative dentistry & Endodontics with the chief complaint of yellowish discoloration & stains of teeth. After a brief case history recording it was noted that, patient was born & brought up in Guntrur, Andhra Pradesh which is been considered having high fluoride ppm in drinking water in India. Various treatment modalities were explained to the patient but due to time constraint & immediate need vital bleaching was put forth as possible treatment option to which the patient obliged. Pulp vitality testing was done for all the teeth in upper & lower arch and all teeth were found to be vital. Radiographic examination was also carried out for the same teeth to detect any peri apical pathologies. Proceeding, tooth color shade was evaluated using Vita 3D master shade guide by visual examination under broad day sunlight. Color shade A3 was aptly matching the patient's natural dentition. (Fig) Oral prophylaxis was done prior.

The patient was educated with the cause of discoloration & procedure to be followed including possible treatment outcome. Intra as well as extra oral photographs were recorded & patients consent was taken. Philips zoom in plus, a light activated bleaching device was selected. 15 min prior to the procedure, hydrogen peroxide tubes were de refrigerated. Patient was advocated not to swallow the gel or touch it with bare hands. In case of an emergency or accidental ingestion Vitamin E, local anesthetic, emetic drugs & NSAIDs were kept ready. Patient was informed about possible post treatment cold sensitivity especially during first 24 hours & was advised to use desensitizing paste. Philips zoom bleaching gel contains 25% hydrogen peroxide. The Philips zoom kit comes with retractors, liquid dam, amorphous calcium phosphate (ACP) gel,

25% hydrogen peroxide tube, protective glares, and Vitamin E solution.

Vitamin E was applied to lips & commissure area. Protective glares were worn by patient, dentist & auxiliary. Retraction cords were placed followed by liquid dam application. Liquid dam application was done with 20 seconds light curing using sweeping motion. Liquid dam is a resin & can become warm during curing, so the sweeping motion. No pink rule was followed with applying distal to tooth beyond the area of interest. ACP gel was applied to all the surfaces of tooth. ACP gel precipitates hydroxyapatite & fluorapatite molecules occluding the dentinal tubules. These molecules protect enamel & restore luster via remineralization process, thus enhancing the appearance of tooth giving a glossier & smoother finish. It also helps in reducing post-operative sensitivity.

25% hydrogen peroxide gel was applied to all tooth surface with teeth in interest. Then the Philips plus blue light activated tube was attached to retractor. The machine comes with low, medium & high intensity options along with start, stop & pause buttons with 15 min time interval. The blue light was activated at low intensity for 5 minutes followed by medium intensity for 5 minutes & finally last 5 minutes of high intensity. The patient didn't experience any discomfort during initial 10 minutes but did encounter mild but tolerable sensitivity in high intensity mode. During this time frame the patient shouldn't be left unattended as the light emitting tube is attached to check retractor.

The remaining gel was carefully removed with suction & damp gauze before removing the liquid dam. Don't rinse or irrigate as any remaining hydrogen peroxide might harm soft tissues or patient might ingest it. Patient was satisfied with the outcome. There was improvement in shade guide scale too. Patient was advised not to have any

food items which contain color or tea, coffee or carbonated drinks for 1 week. Also a desensitizing paste was prescribed in case of any post-operative sensitivity. Followed which he was called for a follow up.

After 10 days the patient turned up for follow up & underwent session of bleaching for further improvement in color. So one more session of light curing was repeated with same measures. Patient was happy with the final outcome & enhanced tooth color, chroma & hue. Further a 1 month follow up was done.

Discussion

With advent in technology & evolving science the treatment options are also evolving with time in field of esthetic dentistry. But keeping in place the traditional options, bleaching is one of them. Here Philips zoom plus light activated bleaching was used containing 25 % hydrogen peroxide which is light activated. Theoretically the merit of using light activated (heated) hydrogen peroxide is that it increases the rate of oxygen decomposition thus accelerating free hydroxyl radical release & boosting the rupture of stain molecules. Research has proved that light can enhance whitening with lower concentrations of hydrogen peroxide (15% to 25%). Unlike in 30 or 35% hydrogen peroxide, the advantages of light activated is not observed. It's hypothesized that the quantity of radicals already produced by hydrogen peroxide degradation reaches peak required to react with stain molecules in dentin & any increase in hydrogen peroxide radicals will not accelerate the whitening process or rate of free hydroxyl radical release.

Prior to starting any type of bleaching or tooth whitening procedure detail case history & thorough clinical evaluation is very vital so as to understand the possible etiology responsible for tooth discoloration. Higher concentration of hydrogen peroxide has been reported to effect the underlying pulp leading to pulpal irritation. If

the bleaching agent has been in contact with tooth surface for more than 60 mins, studies have reported that it seeps into the pulp chamber via the dentinal tubules. Hanks et al has inferred that the concentration & duration to which tooth surface is exposed to bleaching agent determines the seepage of bleaching agent into pulp chamber. Various in vitro studies have concluded that bleaching agents take minimum of 15 minutes to enter pulp chamber. The hydrogen peroxide molecule has very small size & weight & thus has the capability to breakdown the amino acids in dentinal tubules & enter the pulp chamber. But in vivo studies by Cohen has shown contradictory results. They have concluded that 35% hydrogen peroxide when in contact with tooth surface for 15 minutes are broken down by enzyme catalase & peroxidase. One more reason for seepage of bleaching agent into pulp chamber has been hypothesized to be the positive pressure in the pulp chamber & osmotic pressure of bleaching agent.

Conclusion

In office, light activated tooth bleaching is the byproduct of newer technology & increasing esthetic demand of patient. There is minimum chances of sensitivity or pulpal damage only if followed with proper procedure.

Disclaimer

Some of the clinical photographs have been tilted & cropped. But no other digital editing has been done on any of photographs.

The authors of this article certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company that is presented in this article.

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Legend Photo



Figure 1: Procedure Apply



Figure 2: Application of hydrogen peroxide gel



Figure 3: Pre op



Figure 4: First sitting



Figure 5 Second Sitting