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Case series of in office teeth bleaching with ultradent opalescence boost

[1]Dr Vinaykumar G Suryavanshi, Senior Lecturer, Department of Conservative Dentist & Endodontist, MM, NGHIDS & RC, Belagavi - 590019

[2]Pratiksha Shetty, Post Graduate Student, Conservative Dentist & Endodontist, Dayananda Sagar College of Dental Sciences, Bengaluru

[3]Dr Payal M, Post Graduate Student, Conservative Dentist & Endodontist, Dayananda Sagar College of Dental Sciences, Bengaluru

[4]Dr Nawal Abdul, Post Graduate Student, Conservative Dentist & Endodontist, Dayananda Sagar College of Dental Sciences, Bengaluru

[5]Dr Chandini Gupta, Post Graduate Student, Conservative Dentist & Endodontist, Dayananda Sagar College of Dental Sciences, Bengaluru

[6]Dr Shravya G, Post Graduate Student, Conservative Dentist & Endodontist, Dayananda Sagar College of Dental Sciences, Bengaluru

Corresponding Author: Dr Vinaykumar G Suryavanshi, Senior Lecturer, Department of Conservative Dentist & Endodontist, MM, NGHIDS & RC, Belagavi - 590019

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Abstract

Dental bleaching has been widely accepted & practiced dental treatment procedure for years. Many commercial products are available today with or without ultra violet light & lasers application. Ultradent boost is one such product which is currently available. This case series consists of discolored tooth due to various etiology been treated with help of this product. It consists of 2 gels separated by a thin membrane, the whitening gel & activator. They are mixed by pressing the plunger back forth multiple numbers of times & applied with help of applicator tips supplied with the kit. Irrespective of the etiologies of discoloration the outcome was satisfactory with the kit. Hydrogen peroxide is 40% in concentration but has no side effects like dentinal hypersensitivity & pulpal damage. Also there is no need of additional ultra violet light or laser application as the gel itself gives good results. Thorough isolation with cotton & high

volume suction is required as hydrogen peroxide if in contact with soft tissues can be inflammatory & produce burning sensation. Ultradent boost is cost effective too & easy to perform. Long term outcome of bleaching with ultradent is yet to be studied though & requires periodic follow up & maintenance.

Keywords: Ultradent boost bleaching, discolored tooth, hydrogen peroxide, in office bleach, fluorosis.

Introduction

With increase in literacy & increase in social media influence there has been increase in patients demand for more esthetic & whiter tooth. Dental bleaching has become a known, accepted conservative treatment for tooth with discoloration due to many reasons. Hydrogen peroxide based products are widely accepted & marketed owing to their superior results. But this product differs in concentrations, forms & application methods based on their applications. (In home / at office). In office tooth whitening products use high concentration of hydrogen peroxide (H2O2), from a concentration of 25% to 40% to attain a superior bleaching effect. Newer combinations also have light source as auxiliary to enhance H2O2 absorption.

Discolored anterior tooth can decrease a person's self-confidence & has a social life stigma too. Various treatment options are available today with advent of newer technologies & dental materials. Right from conservative treatment approaches like micro abrasion to invasive options like veneers & crowns. But tooth bleaching has been practiced since long & has been deemed a conservative & successful treatment protocol.

But this wide range of products available today makes it difficult to choose as there is case to case variation. UV light assisted bleaching & heat treated bleaching has been said to have additional absorptive effect of hydrogen peroxide adds to the diversity. The proceeding case series elaborates on ideal case selection, patient motivation, and post-operative management of in office ultradent boost bleaching.

Case 1

A 22 year old female patient with recently completed orthodontic treatment visited Department of Conservative Dentistry & Endodontics with chief complaint of yellow anterior tooth. On clinical examination, moderate yellow lines of discoloration were seen. The patient was explained about all possible treatment options available from conservative to invasive. Patient opted for in office bleaching.

Complete history was elicited from the patient regarding birth & early childhood days of patient. Electric pulp testing was performed on maxillary anterior tooth & all were gave a vital response. Radiographic examination was done to confirm the same. The patient had no history of dentinal hypersensitivity. Clinical photographs were recorded with a DSLR camera. Oral prophylaxis was carried out before initiating bleaching procedure.

The ultradent opalescence boost kit was removed from refrigerator & kept out to allow it come to normal temperature. Pre-operative shade of tooth was recorded with VITA shade guided as A2.5. Cheek retractor was placed. Opal dam resin barrier was applied on gingival margins at continuous speed with the formula of no pink. It was flash cured for 40 seconds. Gums & teeth were dried with cotton.

The small clear syringe was pressed to rupture the internal membrane & combine the whitening gel with activator. Plunger was pulled completely back to ensure a thorough mix. This was done continuous back & forth for 20-25 times. Followed by the complete mixed gel was pressed into the red syringe. 2 syringes were separated & tip was attached. The mix in the syringe was dispensed on a mixing pad to ensure the consistency &

flow of material as well for ease of application. 1mm thick layer of gel was applied on labial surface of tooth & left for 20 minutes. Patient was instructed to raise hand in any case of gingival burning sensation or dentinal hypersensitivity. Periodic suctioning of saliva was done with a high volume saliva evacuator.

The areas were the gel was thinned out there gel was re applied. After 20 minutes remaining gel was suctioned back & later wiped with gauze. Note water syringe shouldn't be used as it can lead to splatter on gingiva & extra oral surfaces including operator & assistant's body. Patient was questioned for any burning sensation or dentinal hypersensitivity to which she replied negatively. Post-operative photographs were recorded. Patient was recalled after a week. VITA shade was noted to be A1. The patient had no post-operative issues & was markedly happy & satisfied with the esthetic treatment.

Case 2

A 25 year old male patient visited Department of Conservative Dentistry & Endodontics with a chief complaint of unaesthetic yellow front tooth. On clinical examination mild yellow discoloration was observed over all the labial surfaces of teeth. The patient expressed that he had a marriage to attend & hence opted for immediate result treatment. Oral prophylaxis was carried out. Patient had no history of dentinal hypersensitivity. Pulp vitality testing & radiographs were done to check vitality of all the tooth & rule out any other cause of discoloration. Different types of bleaching were explained to patient. Patient opted for in office ultradent opalescence boost bleaching. Clinical photographs were recorded by DSLR camera.

Pre-operative shade of tooth was recorded with VITA shade guided as A2.5. Opal dam resin barrier was applied on gingival margins at continuous speed & was flash cured for 40 seconds. As previously described the whitening gel & activator were mixed in the syringe by breaking the internal membrane. A thorough mix was obtained was dispensed on mixing pad. 1mm thick layer of gel was applied on labial surface of all the maxillary anterior tooth & left for 20 minutes. Remember the patient shouldn't be left un attended during this time. After the removal of liquid dam & gel patient didn't had any burning & sensitivity. Post-operative photographs were recorded & VITA shade guide was recorded as A1. The patient was recalled for follow up after 10 days & he was happy with the outcome.

Discussion

Discolored tooth are one of common dental problems patients come up with. Various bleaching techniques are employed popular being in office. Hydrogen peroxide is the star bleaching agent we have which has been used in various formulations& percentage (20 to 40) %. Various formulations re available today of hydrogen peroxide differentiating on basics of handling properties, additional components, pH stabilizers, thickness & vehicles along with some ultra violet activated too. The ultradent opalescence boost comes up in gel in a syringe form with 40% hydrogen peroxide concentration. The box contains green syringe containing gingi dam, red syringe containing activator & whitening gel & delivery tips.

Mechanism of action understood is that the bleaching gel carries out oxidation reaction while in contact with teeth dissociating into water & oxygen. Reactive molecules such as hydroxyl, peridroxyl & superoxide ions are generated as by products. Due to low molecular weight of hydrogen peroxide it has the capacity to penetrate into dental hard tissues & bring about protein denaturation. This allows deeper penetration of bleaching agent into pigmented hard substrate. Further this pigmented

molecules are broken down into smaller molecules & omitted out by diffusion.

Pigment molecules have a specific wavelength of light. So once this molecules are broken down light comes in direct contact with enamel & dentin & thus we see color change. Here in both the above cases opalescence boost was used. Though a costly product, it has favorable results. It is different than other commercially available bleaching kits. The whitening agents are chemically activated & that omits the need for light activation & getting exposed to ultra violet light. Few studies in past have elicited that light or heat activation of bleaching agent can cause increased probability for post-operative sensitivity. Also the additional benefits of using light activated benefits are not remarkable better than chemically activated & their mechanism of action isn't completely understood.

Kugel et al showed that use of light didn't had any benefit over chemically activated tooth whitening systems after a 2 week re call. Hein DK et all conducted a study comparing all 3 systems. All the 3 systems did lighten the shade of 83 contralateral pair of anterior tooth to nearly same degree of 1.6 to 1.8 value of chroma.

Whitening gels include potassium nitrate & fluoride in their composition. Potassium nitrate helps in reducing post-operative sensitivity immediately whereas fluoride helps in reducing long term dentinal hypersensitivity by increasing the enamel hardness by fluoride deposition. Rest of composition contains liquid or water & water by products which prevents tooth from drying excessively & dissipates heat generated by pigment diffusion.

Before thinking of bleaching the patient should be given all possible treatment possible plans. For that a proper case history recording is very vital. It includes patient's personality, expectations, oral hygiene maintenance, dental motivation, history of dentinal hypersensitivity, birth & early childhood days, history of trauma, alignment of teeth, white spots lesion, socio-economic status & cooperation. Also pulp vitality testing & radiographs help us identify any underlying endodontic cause of discoloration.

Dentist should always get a round of oral prophylaxis done irrespectively which will help to identify the actual shade of tooth & remove any macro debris.

Also if there is any gingival inflammation present, oral prophylaxis will help. This is important because in presence of gingivitis if the bleaching agent comes in contact with gingiva or gingival crevicular fluid it can cause extremely burning sensation to patient where then you will need to emergently abort the treatment & console the patient. Also dentist can consider administration oral NSAID just before the treatment to prevent unpredictable sensitivity. Also bleaching should not be considered in patients with gingival recession or root exposure due to any reason. As bleaching agent directly in contact with dentine will surely cause increased dentinal hypersensitivity.

As a precaution Vitamin C ointment/ gel can be kept in tray. This isn't available in the ultradent kit but has been effective in reducing the immediate / accidental burning of gingiva. This emphasizes on gingival tissue protection with help of gingival dam & rubber dam if required. Also re assuring the patient in case of sensitivity is very important. This makes post-operative instructions very important along with follow up. Restrictions of eating / drinking food / liquids containing artificial colors is recommended. There are very high chances that the recently bleached tooth surface which is open to diffusion can readily take up thus artificial colors & discolor the tooth further to greater extent thus doing more harm than good.

Also the age of patient plays a vital role as in young patients the diffusion rate into dentinal tissues is good & thus penetration of bleaching agent's deeper & further better results. Bleaching agent penetration into pulp chamber depends upon concentration, thickness & time duration of exposure of bleaching agent. The result of in vitro studies differs than in vivo studies in this accept. As Hanks et al concluded that, 15 minutes are required for 35 % hydrogen peroxide to enter pulp chamber, where as in vivo study done by Cohen & Robertson showed that there was no pulpal inflammation with same concentration for same time period. Thus can be attributed to positive pressure present in pulp chamber, osmotic pressure & presence of enzymes catalase & peroxidase.

Conclusion

Dental in office bleaching of vital teeth is a popular, well accepted & easy to do procedure practiced today. But proper patient selection, counseling & predictability is required. Various bleaching kits are available today but they should be bought keeping in mind patients clinical expectations & not market standards blindly. It is safe to do unless gross negligence is observed by the clinician. A careful monitoring & critical approach is primarily important. With this I would like to conclude that Ultradent opalescence boost is useful in most of clinical scenarios of discolored tooth with easy to use procedure & the only drawback would be the cost factor.

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 Figures

Case 1

Figure 1: Material Used

Figure 2: Pre-operative

Figure 3: Post-Operative

Case 2

Figure 4: Procedure

Figure 5: Post-Operative