



Dental Fluorosis Management Using Power Bleach – A Magic Wand

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Dental fluorosis is a particular condition brought on by long-term, excessive fluoride consumption during the formation of enamel. Fluorosis staining is frequently seen as an aesthetic problem may have psychological effect of when seen on maxillary anterior teeth. Bleaching, microabrasion, veneering, and crowning are some of the treatment options. Bleaching is a conservative approach of restoring the colour of teeth with intrinsic discolouration. Among the various bleaching techniques, In-office or Power bleaching techniques are effective to obtain result immediately. The dentist is in complete control of the process throughout the treatment. It is a fast process and results are evident in single visit. Here we present a case of management of dental fluorosis using Power bleaching technique.

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1. INTRODUCTION

Dental fluorosis is a unique disruption to the dentition caused by an excessive consumption of fluoridated water while teeth are still developing stage. It is primarily caused by direct intakes of water as well as indirect intakes, such as those from other consumptives. White opacities, orange-brown patches, or streaks, along with enamel surface imperfections, are symptoms of enamel demineralisation. Some findings suggested that dental fluorosis' antiaesthetic colorations have an impact on adolescents' psychosocial relationships. Therefore, it becomes even more urgent to find a suitable therapy [1].

It is believed that whiter teeth are more attractive and healthy has gained more attention among people, and desire to have whiter teeth [2]. The variety of treatment choices includes highly invasive ones like crowns, veneers, and the placing of direct restorations, as well as minimally invasive ones like macro abrasion, micro abrasion, and bleaching, as well as simple prophylaxis. Bleaching is an excellent option out of the many services provided to improve the appearance of discoloured teeth [3]. According to a survey conducted by Christensen et al. [4], reports 79% of dentists who utilized bleaching treatment in their offices reported that it was successful. Additionally, some teenagers between the ages of 14 and 19 who have had their teeth bleached have expressed interest in doing it again.

Today, a variety of bleaching techniques are employed, depending on whether they entail vital or non-vital teeth and whether in-office professional, in-home professional (dentist-supervised take-home), over-the-counter product or outside the dental office. It is advised to utilize alternative lighting techniques or increase the chemical concentration to fasten the bleaching process [1,5]. When compared to other treatments, vital bleaching techniques for the treatment of discoloration are more conservative and economical. There are three primary approaches for bleaching the teeth: in-office or power bleaching; at-home or night-guard bleaching under dentist supervision; and bleaching with over-the-counter (OTC) products. Among these, In-office or power bleaching is done under the close observation of a clinician to

prevent damage to soft tissues and gel ingestion. This shortens the overall treatment duration and results in a quicker turnaround in terms of bleaching efficacy [6]. The most commonly used In-office or Power bleaching techniques use hydrogen peroxides with high concentrations and are frequently referred to as "one-hour bleaching." These hydrogen peroxides at high concentrations have a range of 25% to 35% [7]. This paper demonstrates a method for Power bleaching technique using light cure unit and SDI pola office.

2. CASE REPORT

A 14-year-old female patient came to the department of pedodontics and preventive dentistry with the chief complaint of brownish discoloration in her upper front teeth region and wanted to have their teeth treated for aesthetic purposes. Patient gave a history of discoloration since her childhood and were consuming borewell water in her native place, which is in fluoride-belt region. On family history, few of the patient's relatives are affected by this similar condition. No other medical or dental history has been obtained from them.

On extra oral examination, no abnormalities have been detected. On intra oral examination, patient had generalized whitish discoloration and discrete pitting was seen in the labial surfaces of 11,12,21, and two third staining of the intact enamel surface had seen in the upper anteriors in relation to 11,12,21. Patient was diagnosed with advanced case of fluorosis (TSIF-5).

3. CRITERIA FOR DIAGNOSIS OF DENTAL FLUOROSIS [8]

The Tooth Surface Index of Fluorosis (TSIF), which was proposed by Horowitz et al., assigns teeth a score between 0 and 7 depending on the degree of coronal involvement and their external appearance. In milder situations (TSIF 1-3), white enamel defects progress over the affected tooth surface area. A more advanced stage (TSIF > 4) of the condition results in changes to the enamel's surface texture, such as pits and fissures, as well as colour changes.

Treatment plan of In-office or Power bleaching technique was planned.

4. CLINICAL PROCEDURE

The treatment-required teeth were cleaned and dried. Isolation was done using cotton rolls, in order to prevent periodontium from irritation, photoactivated gingival barrier was applied. SDI Pola Office was selected as the bleaching agent to perform power bleaching technique for this patient (Fig. 2). Equal parts of the two ingredients—bleaching gel and powder were combined to create a thick, uniform slurry that was then applied to the teeth using an applicator tip. Agent was only applied on the concerned teeth. For eight minutes, the gel is left on the tooth's surface and it was activated by using LED bleaching system for 3 minutes with the wavelength of 460-490 nm, 40 VA, 60HZ power supply (Fig. 3). Within the same appointment, three 8-minute cycles were completed. Total contact time of gel to enamel was $8 \times 3 = 24$ minutes and total time of LED light activation was $3 \times 3 = 9$ minutes. After that, the bleaching agent had been removed using an air-water syringe.



Fig. 1. Advanced case of fluorosis (TSIF-5)



Fig. 2. SDI pola office

After the completion of procedure, post operative pictures were taken (Fig. 4) and post operative

instructions were given to the patient and recalled after one week for the evaluation of rebound of staining and sensitivity. The patient observed a noticeable change in the colour of their teeth and felt satisfied with the outcome. 3-4 days after treatment patient had mild sensitivity.



Fig. 3. Power bleach unit



Fig. 4. Immediate post-operative photograph

5. DISCUSSION

The term 'Power bleaching' called bleaching that is done in the clinic using power bleach unit, where immediate results are expected. Here, we chose Power bleaching technique, because the

patient had diagnosed with advanced case of fluorosis.

Resolution of aesthetically unpleasing enamel defects which might differ in aetiology, colour, length, and depth, is one of the largest difficulties dental professionals' encounters. Hypomineralization is the defining characteristic of all white enamel defects, including white spot carious lesions, dental fluorosis, traumatic hypomineralization, and molar incisor hypomineralization. Various therapeutic modalities can be employed to enhance the aesthetic look of these defect [9]. Pediatric dentists find it difficult to treat fluorosis-related complaints in children and adolescents. Therefore, bleaching appears to be one of the most conservative methods of treatment for dental fluorosis among the various options mentioned [10].

The process of lightening the colour of teeth by using a chemical substance to oxidise the organic pigmentation in the teeth is called bleaching. The purpose of the bleaching technique is to restore the tooth's natural colour by discolouring the stain with a potent oxidising substance known as the bleaching agent [11]. Nearly all of the causes of tooth discolouration, including disintegration of the pulp tissue, internal bleeding, trauma cases, medication use, and systemic disorders including fluorosis, jaundice, and fetal erythroblastosis, are suitable for the use of a bleaching technique. The main contraindications to bleaching include using it on children under 10 years of age, new-borns, pregnant women, people who have exposed dentinal tubules on their teeth, smokers who can't quit during the treatment, and people who have extremely sensitive teeth [7].

To achieve faster tooth whitening, either higher hydrogen peroxide concentrations (25–40%) or application of accelerator LED light are employed. In our present case also, 35% of hydrogen peroxide used along with light activated power bleaching to enhance the bleaching action for better results [12,7].

The main side-effect of bleaching treatment is tooth sensitivity, which is found to occur in 18–78% of patients after bleaching operations according to clinical research studies. In the present case, a Pola office bleaching kit was utilised. In addition to 35% hydrogen peroxide, the Pola office also contains potassium nitrate, which decreased the patients' post-operative

sensitivity. Only with the use of bleaching lights or heat application, pulpal irritation and tooth sensitivity may be increase. In this case, we didn't encounter hypersensitivity [7,13].

Professionals in the domain of oral health should take great care when choosing the type, concentration, and method of bleaching (such as in-office, at-home, light-activated bleaching system, or not), and they should provide specific guidance on how to prevent and treat sensitivity.

6. CONCLUSION

Several manufacturers and researchers have developed bleaching procedures that may be used at home or in the dental clinic as a result of the rising demand for tooth whitening. A quick and efficient treatment option that can substantially alter the appearance of teeth is vital tooth whitening. Vital teeth bleaching is a good and secure option for dentists treating mild to moderate teeth discolorations when used in the right concentration of the agent.

CONSENT

Consent was obtained from patient's parents.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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