

An Alternative Technique of Bleaching Vital Tooth: A Case Report

Lora Mishra¹, Pratima Panda², Shashirekha Govind³, Debkant Jena¹, Manoj Kumar⁴

¹Professor, ²Post Graduate Trainee, ³Professor & Head, Department of Conservative Dentistry & Endodontics, ⁴Associate Professor, Department of Periodontics, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India

Abstract

Fluorosis staining is commonly considered an esthetic problem because of the psychological impact of unesthetic maxillary anterior teeth. Numerous treatment approaches have been proposed, ranging from bleaching to enamel reduction to restorative techniques. The aim of this study was to report the clinical case of a female patient of 18 years with moderate fluorosis with midline diastema, whose smile was reestablished by the application of 5% sodium hypochlorite bleaching agent after cleaning and enamel etching with 37% phosphoric acid followed by direct composite veneering. This technique showed excellent results and the patient was satisfied. This technique is simple, low cost, painless, fast and easy to perform, in addition to preserving the dental structure. Treatment showed immediate and permanent results.

Keywords: Bleaching, fluorosis, sodium hypochlorite, Veneering.

Introduction

Tooth discolouration is complex in nature and is broadly classified as extrinsic and intrinsic stains.¹ Extrinsic stains on a tooth surface caused by dietary chromogens can be managed by oral prophylaxis. It is the intrinsic stains that are within the dentine require non-invasive and invasive management depending on the degree of discolouration or stains.² One of the most common intrinsic stains seen in Indian population is caused by increased fluoride level in the water. The reason could be that India is in the geographical fluoride belt and in areas where fluoride content is high in rocks or soil, leaching of fluoride occurs, causing excess fluoride level in groundwater.³ Depending on the extent of exposure to fluoride, the degree of fluorosis can vary

from mild to severe and structural deformity of the tooth.⁴ Bleaching is a non-invasive and conservative approach to manage mild to moderate fluorosis. The only drawback of bleaching is that hydrogen peroxide causes dentinal sensitivity and gingival irritation. It is contra indicated in the tooth with large pulp horns.²

Young patients are usually concerned about their anterior tooth discolouration. Therefore an alternative approach to managing young permanent teeth having large prominent pulp horns is required. A conservative treatment approach for the management of yellow-brown intrinsic staining of dental enamel is described in this case report.⁴

Case Report: A 17-year-old patient complaining of brown stains and spacing of the upper front tooth region reported to the Dental school (Figure 1). After a thorough case history and clinical examination, we arrive at the diagnosis of mild fluorosis. On a radiograph, the Maxillary right and left central incisor (11 and 21) exhibited high pulp horns. Due to mildness of the stains, a conservative treatment plan was presented to the patient that would fulfil his request, which is bleaching with sodium hypochlorite.

Corresponding Author:

Prof. Lora Mishra

Department of Conservative Dentistry & Endodontics,
Institute of Dental Sciences, Siksha 'O' Anusandhan
(Deemed to be University), Bhubaneswar, Odisha,
India

e-mail: loramishra@soa.ac.in

The patient was referred to the Department of Periodontics for oral prophylaxis for removal of plaque and extrinsic stains. After two days patient came to our department of Conservative Dentistry and Endodontics. Before the treatment, shade selection of teeth with composite buttons was made under natural light. Anterior segment was isolated with a rubber dam. The teeth were then acid etched with 37% phosphoric acid (Meta Etchant by Meta Biomed) for 60 sec (Figure 2) to enhance the effectiveness of the hypochlorite action on the stained tooth. Etchant was rinsed with three-way syringe. Frosty appearance of enamel completed the etching procedure. This was followed by sodium hypochlorite 5% (Prevest) application on to the entire tooth surface of the anterior segment using a cotton pellet (Figure 3). The bleach is continuously reapplied to the tooth as it evaporates. The teeth were bleached in a single appointment for 25–30 min. Significant improvement in the shade of teeth was observed.

Teeth were thoroughly rinsed with water and again re-etched with 37% phosphoric acid (Meta Etchant by Meta Biomed). A universal bonding agent (3M ESPE) was applied and then gently airdried to have a uniform coat over the teeth. This resin perfuses in the etched and porous enamel, creating resin tags that occlude the porosities and prevent re-staining of the hypo-mineralized lesion. The diastema closure was done using composite (3M ESPE A2 Shade) (Figure 4). The patient was recalled for follow up after 6 months. He did not complain of sensitivity and was very satisfied with the treatment outcome.

Discussion

Bleaching is considered as the gold standard treatment for fluorosis, tetracycline stains and other internal discolourations.⁵ It is a non-invasive technique and results in the better shade of teeth in just one to three dental appointment depending on severity. It has high acceptability rate among patients.⁵ However, the bleaching procedure poses a threat to young large pulp chambers and pulp horns and therefore contraindicated in a young permanent tooth. The agents like hydrogen peroxide are known irritant and cause a chemical burn of soft tissues surrounding the tooth. They penetrate inside the dentinal tubules and cause dentinal hypersensitivity as well.⁶

Many studies show that the bleaching agent is known to reduce the bond strength of the enamel resin

composite. There is a minimum waiting period of 1-week advocate post bleaching and aesthetic rehabilitation of tooth with composite.⁷ This technique of acid etching combined with bleaching with sodium hypochlorite is an effective alternative to regular bleaching procedure and can address the above issues effectively.⁸ The sodium hypochlorite technique has several advantages over peroxide-based protocols for the specific application of removing stains from localized hypo mineralized lesions in young teeth. It is known to be highly effective at removing organic material by oxidizing it and allowing the smaller degraded molecules to be washed away. Applying sodium hypochlorite to hypo-mineralized enamel lesions, can degrade and remove the chromogenic organic material that is, located in the enamel.^{7,8} It has been shown that pretreatment of the enamel with sodium hypochlorite to remove the enamel proteins can enhance the ability of acid to etch the surface, thereby improving the likelihood that resins can bond successfully to the surface.⁹



Figure 1. 11 & 21 with fluorosis stain



Figure 2. Anterior segment etched with 37% phosphoric acid



Figure 3. Anterior segment bleached with sodium hypochlorite



Figure 4. 11 & 21 diastema closure done with composite

Conclusion

The above technique uses readily available materials that show a high level of safety and can be used on young permanent teeth. Permanent incisor teeth that have high pulp horns can be treated from this approach. This technique provides a conservative alternative treatment for yellow-brown hypo-mineralized enamel that shows good clinical success. The application of conservative treatment approaches should be considered before applying techniques that require substantial enamel removal for the treatment of enamel discolourations.

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