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VITAL BLEACHING AND ENAMEL MICROABRASION FOLLOWED BY DIRECT COMPOSITE VENEERS FOR THE MANAGEMENT OF FLUOROSIS STAINS: A CASE REPORT

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ABSTRACT Fluorosis stains can significantly impact the esthetic appearance of teeth. In this case report, we describe the management of fluorosis stains in a 15-year-old male patient through a combination of vital bleaching, enamel microabrasion, and direct composite veneers. Vital bleaching using hydrogen peroxide was employed to decolorize the stains, followed by enamel microabrasion using Opalustre containing 6.6% HCl acid and silicon carbide abrasive particles to remove the remaining superficial bands. Direct composite veneers were done to the central incisors to further improve the esthetic outcome. This case demonstrates the efficacy of this treatment approach in the management of fluorosis stains.

KEYWORDS : fluorosis, vital bleaching, enamel microabrasion, direct composite veneers

INTRODUCTION

Teeth discoloration can be due to intrinsic stains and extrinsic stains. Intrinsic staining can be due to fluorosis, tetracycline drugs, ageing, enamel hypoplasia etc. and extrinsic staining can be due to tobacco, stains of food, beverages etc1. Bleaching is one of the procedures to treat the discoloration of both intrinsic and extrinsic stains. For vital teeth, in-office or power bleaching is preferred and performed using high concentrations of hydrogen peroxide and a light or heat source for the activation of the agent. In -office light system is based on a plasma arc high intensity photopolymerization device that can be used for in-office whitening and for resin photopolymerization[2].

The main indication for enamel microabrasion is intrinsic discoloration or texture alteration due to enamel hypoplasia, amelogenesis imperfecta, or fluorosis. It helps to remove the porous surface enamel layer, entrapped stains, in a similar way that a dental prophylaxis with pumice and water is performed[3].

In the present case report, vital bleaching, followed by micro abrasion and direct composite veneers was done to achieve desired esthetic outcome

CASE REPORT

A 15-year-old male patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of discolored teeth. After taking detailed case history and clinical examination, it was diagnosed as Severe Fluorosis with a TF score of 6 according to Dean's Fluorosis Index. The treatment plan was vital teeth bleaching from 14-24 followed by microabrasion and direct composite veneers with 11 and 21.

Figure 1 Pre-operative image

Vital Bleaching

After rubber dam isolation, 35% hydrogen peroxide (DASH, Philips, USA) was applied on the labial surface of teeth 14-24 and LED light activated for 10 minutes for 3 cycles. The lightening of shade was noted and patient was prescribed desensitizing paste and was recalled after 1 week for microabrasion.

Figure 2 Rubber dam isolation followed by application of H2O2

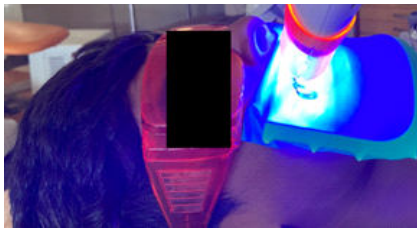

Figure 3 Light activation of bleaching agent

Figure 4 Post bleaching (after 3 cycles of 10mins each)

Microabrasion

Using Opalustre (Ultradent, USA) containing 6.6%HCl, microabrasion was carried out using slow speed micromotor handpiece attached with a rubber cup. 1mm thick layer of Opalustre (Ultradent, USA) was applied on central incisors and abrasion was performed for 3 cycles of 60s each. The reduction in fluorosis band was appreciated and direct composite veneers was planned for better esthetic results.

Figure 5 Application of Opalustre

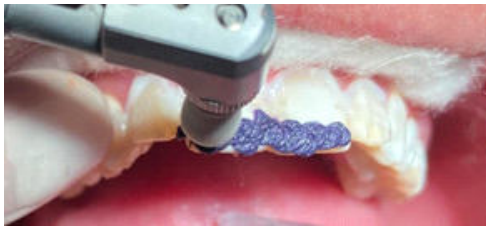

Figure 6 Abrasion done using slow speed handpiece attached with rubber cup

Figure 7 Post enamel microbrasion of central incisors

Direct Composite Veneers

Shade selection was done using lateral incisors as reference. Shade B1 of vita shade guide was selected. Window preparation to receive direct composite veneers with 11 and 21 was done. The teeth were etched with 37% phosphoric acid (Ivoclar vivadent) for 15s, rinsed with water and dried, followed by application of adhesive (One Coat Bond SL) and light cured for 30s. Using nanocomposite (Tetric® N-Ceram Bulk Fill, Ivoclar Vivadent) the veneers build up was done and light cured for 30s each.

Figure 8 Shade selection for direct composite veneers

Figure 9 Post-operative image after composite veneers

DISCUSSION

Bleaching procedure involves lightening of the color of the tooth by application of a chemical agent to oxidize the organic pigmentation in the tooth. The goal of bleaching procedure is the restoration of normal color of a tooth by decolorizing the stain with a powerful oxidizing agent known as bleaching agent4. In vital bleaching, Hydrogen Peroxide is the active ingredient, which is commonly delivered as HP or CP in commercial agents5. Hydrogen peroxide is an oxidizing agent capable of producing free radicals, releasing oxygen (O2), reducing the complex carbonic chain of the pigment (which absorbs the blue spectrum of light), into smaller molecules with free hydroxyls (which do not absorb blue light) and so reflect the blue light along with the green and red spectra; this color mixture gives the whitening effect[6].

In the present case, after vital bleaching, the fluorosis stains were reduced considerably, therefore we decided to perform enamel microabrasion, in order to remove the remaining discoloured fluorosis bands and pits. Enamel microabrasion has become accepted as a conservative, non-restorative method to improve the appearance of teeth with superficial demineralisation and decalcification effects7. Opalustre (Ultradent, USA) containing 6.6% Hydrochloric acid(HCl) containing silicon carbide abrasive particles was used for microabrasion. In addition to the removal of discolored enamel, the microabrasion technique changes the optical characteristics of the enamel surface[8].

Since microabrasion cannot remove the deeper stains and leaves behind a rough surface which is prone to extrinsic stains in future, direct composite veneers were planned with respect to central incisors. Veneers with direct resins are one of the common treatment options for clinical applications following the developments in adhesive and restorative dentistry in recent years9. It is a single visit, minimally invasive, long lasting treatment option for esthetically pleasing results. The advantages include easy polishing and intraoral repair of cracks and fractures[10].

CONCLUSION

Currently, different treatment modalities are available to the patient designing a whiter smile. The clinician should educate themselves to be able to inform their patients about the benefits and risks of different whitening methods based on the current scientific evidence and to suggest the best treatment option based on a correct diagnosis.

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