

Treatment of Moderate Fluorosis with Combined Bleaching Protocols

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Abstract

The patient's concern was the appearance of her maxillary and mandibular teeth, which had a mottled, brown-yellow enamel dysmineralization due to moderate fluorosis. The patient was 45 years old, and lived in Isparta region where drinking water has high concentration of Fluoride ion. Patient was a female doctor and was concerned that the appearance of her teeth would negatively impact interactions with her patients and social life.

Methods and Materials

Step I: Office Bleaching + Home Bleaching (with tray): In-office bleaching treatment (35% hydrogen peroxide gel) applied to patient 1 week after periodontal treatment. Two bleaching trays were fabricated for the maxillary and mandibular arches, and the patient was given a 16% carbamide peroxide bleaching gel to be used with 5 hours tray application for 3 consecutive days

Step II: Enamel Microabrasion: One week after initial office bleaching, areas which still have moderate discolorations treated with microabrasion paste

Step III: Office Bleaching + Home Bleaching (with tray): One day after microabrasion, in-office bleaching treatment applied again and home bleaching with trays continued 3 more days

Results and Conclusion

The combination of microabrasion, in-office and home bleaching procedures provided faster, non-invasive and satisfactory results

Keywords: Fluorosis; Bleaching; Microabrasion

Introduction

It is known that the result of excess intake of fluoridated drinking water during tooth formation causes fluorosis. Not only direct intake of water but also indirect intakes in form of other consumptives are almost equally responsible for fluorosis. Other indirect factors like nutrition of the child, duration of breast feeding, consumption of tea, climate and use of fluoridated toothpaste have an influence on the frequency and severity of dental fluorosis [1-5]. Beside dental fluorosis, excess intake of fluoride can cause several skeletal and non skeletal diseases, such as osteoporosis, arthritis, infertility also endocrine gland problems and Alzheimer's disease [6-9]. Long-time consumption of drinking water with excess fluoride during adolescence may occur skeletal deformities and also fluoride can cause weakening of bones [10]. Usually as a result of excess intake of fluoridated drinking water during tooth formation, the number of patients affected by fluorosis increased considerably. Enamel dysmineralizations appear as white opacities or orange-brown spots or streaks combined with superficial defects of enamel [11]. Some results indicated that anti-aesthetic colorations due to dental fluorosis affect adolescents and their physicosocial relationships [12]. Aesthetic management of this type of teeth requires smoothening of teeth surface combined with bleaching protocols. Although aesthetic smile designs with porcelain restorations are extremely popular and satisfying, minimally invasive protocols are also popular for the patients who don't want any invasive treatment. Microabrasion is a minimally invasive procedure and bleaching protocols are non-invasive [13]. Microabrasion reduces intrinsic fluorosis stains effectively and doesn't damage enamel structure [14]. In-office bleaching supported with home bleaching with trays to have better results [13]. This case report describes a minimally invasive technique for the management of moderate fluorosis, with the aim of having maximum aesthetic results. In this case, a home bleaching

technique was used, followed by in-office dental bleaching (35% hydrogen peroxide) to harmonize better the tooth color combined with enamel microabrasion (silicon carbide and 6.6% hydrochloric acid) to eliminate discolorations and mottles.

Description of the case

The patient was seen at the Department of Restorative Dentistry of Ankara University, Ankara, Turkey. Patient is a 45-year-old woman, who lived in Isparta region where drinking water has high concentration of fluoride ion. Her main complaint was the discoloration of her maxillary anterior teeth (Figure 1). Clinical examination and the anamnesis revealed the moderate fluorosis. The patient refused any procedure that would include preparation on her tooth surfaces. After initial discussion, a decision was made to use a combined technique of enamel microabrasion to her maxillary anterior teeth, together with in-office dental bleaching and home bleaching with trays [13]. First, the patient had a periodontal treatment. One week later, the teeth to be treated were cleaned with pumice. Before the in-office bleaching procedure, two bleaching trays were fabricated for the maxillary and mandibular arches. The patient was given a bleaching agent gel (Total Blanc c16: 16% carbamide peroxide) (DFL Nova) to be used for 5 hours a day via bleaching trays for 3 consecutive days, in accord with manufacturer's instructions. In the clinic step, the soft tissues were protected with polymeric barrier of the bleaching set. The bleaching agent (Total Blanc H35: 35% hydrogen peroxide gel) (DFL Nova) was prepared according to manufacturer's instructions and applied onto the buccal surfaces of the isolated teeth. The bleaching agent was applied on maxillary and mandibular anterior teeth and properly removed after 20 minutes (Figure 2). This procedure was repeated 3 times. One week later, small areas maintaining moderate discolorations were applied microabrasion with prophy cups and micro abrasion paste (Opalustre, Ultradent), which contained 6.6% hydrochloric acid and silicon carbide microparticles to help remove unsightly enamel decalcification defects. This product is ideal for superficial white and brown demineralization due to enamel mottling from fluorosis. This procedure was repeated 2 times (Figure 3). One day after micro abrasion, in-office bleaching treatment was applied again and home bleaching with trays was continued 3 more days (Figure 4 and 5).



Figure 1: Initial



Figure 2: After Step 1



Figure 3: Microabrasion



Figure 4: After Microabrasion



Figure 5: Result

Discussion

In cases of generalized stains, the knowledge of cause, type and depth of the defect is important for the correct treatment plan [15]. In this case, the patient described a history of prolonged consumption of fluoridated water during her childhood. Her teeth exhibited brown-yellow and white-opaque lesions indicating the diagnosis of fluorosis. Treatments of fluorosis depend on severity of the condition. Classification of the severity of dental fluorosis by the Thylstrup and Fejerskov Index (TFI) is appropriate for deciding the type of treatment because it is based on the biological changes in fluorosed enamel. For very mild forms of fluorosis (TFI 1, 2), bleaching can be recommended. For treatments of moderate dental fluorosis (TFI 4, 5), micro abrasion is preferred, where the outer layer of affected enamel is abraded from the tooth surface in an acidic environment. Composite restorations combined with microabrasion or aesthetic veneers can be used for the patients with $TFI \geq 5$. However, for severe cases with TFI 8–9, prosthetic crowns may be required [16]. The microabrasion technique is considered to be a minimally invasive procedure for fluorosis [14-18]. It can be concluded that pastes used in the enamel microabrasion is effective for removing fluorosis stains [17]. Also another new method like infiltration of low viscosity resin based material is available [19]. Reports are available dealing with the distribution of dental fluorosis microabrasion technique [14,18,20-22]. These authors report that dental fluorosis occurred symmetrically in the dental arches [21,22]. Previous cases had successful conclusions with microabrasion and in-office bleaching [14,21]. In our case, we harmonized home bleaching to get better results [14]. In recent literature, reports describe techniques using home bleaching in combination with in-office dental bleaching followed by enamel micro abrasion to achieve better elimination of intrinsic stains [17]. It is expected that yellow-brown fluorosis colorings will not occur again but the patient may need bleaching in further years in case of dissatisfaction with her teeth color.

Conclusion

In this case, the clinical steps of treatment of moderate fluorosis with combined bleaching protocols have been presented. The use of proposed minimally invasive technique for treatment of moderate fluorosis has advantages of being extremely conservative and readily accepted by patients. The procedure of the combination of micro abrasion, in-office and home bleaching provided faster, non-invasive results alternative to direct or indirect veneers. The patient was completely satisfied after all steps. The association of techniques was efficient and can be recommended as a good conservative alternative for the treatment of fluorosis-affected teeth.

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