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CASE STUDY

MINIMAL INVASIVE MANAGEMENT OF SEVERELY FLUOROSED TEETH

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ABSTRACT

Patients whose teeth are affected by severe dental fluorosis with enamel defects (Thylstrup-Fejerskov Index = 5-7) have a great concern regarding the appearance of their teeth and can have psychological impact on the quality of their life. This paper proposes a minimal invasive technique for the esthetic management of such teeth.

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INTRODUCTION

Severely fluorosed teeth (Thylstrup-Fejerskov Index (TFI) = 5-7) are clinically manifested as chalky white opaque areas with pitted surface and irregular patterns of enamel loss involving less than half the external surface (Thylstrup and Fejerskov, 1978; Fejerskov *et al*., 1988). A combination of treatment modalities proposed for the esthetic management of these cases include bleaching, microabrasion and macro abrasion with re mineralization and laminate veneers (Yildiz and Celik, 2013; Tolidis *et al*., 2012). Laminate veneers are the most preferred treatment option to improve the appearance of such teeth (Akpata, 2014), but it requires certain amount of tooth preparation. Minimally invasive techniques should be the first choice of treatment to traditional restorative treatments as many patients prefer their teeth not to be reduced for the restorative treatments. The aim of this case presentation is to report a least invasive technique for the esthetic management of such cases.

Case presentation

Case 1

A 22 year old girl presented to the clinic with the chief complaint of yellowish discoloration and ragged surfaces of her upper front teeth. The medical history was non-contributory. Her sibling also has the same problem. On clinical examination, oral hygiene was good. Generalized enamel fluorosis was seen affecting all the teeth. The labial surfaces of all the teeth displayed a marked opacity with irregular loss of enamel. On the maxillary anterior teeth, the loss was less than half of the entire surface and on the premolars and molars of maxillary and mandibular teeth it was more than half of the labial surface. In the mandibular anterior teeth the loss of enamel was limited to only focal areas. The incisal and occlusal surfaces were reduced due to the loss of enamel structure. The clinical findings (Fig. 1, Fig. 2, Fig. 3) were consistent with Thylstrup-Fejerskov Index (TFI) = 5-7.

Based on the presented clinical condition, a rehabilitation plan was discussed with the patient to improve the esthetic concern and to take care of the tooth wear. The patient was to attend a job interview the next day and requested that something be done for the discolored teeth and the ragged appearance of the teeth since she needed time to comeback for the definitive treatment. She was explained of the proposed technique and agreed to it. The exposure of the teeth during her full smile was from the second premolar to the second premolar on the contralateral side and the pitting was more evident on the maxillary teeth. So it was decided upon agreement with the patient to treat the teeth from the maxillary left second premolar to the contralateral premolar.

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Figure 1. Pre treatment frontal view of Case 1

Figure 2. Pre treatment right lateral view of Case 1

Figure 3. Pre treatment left lateral view of Case 1

Figure 4. Pre treatment Case 2

Figure 5. Post treatment frontal view of Case 1

Figure 6. Post treatment left lateral view of Case 1

Figure 7. Post treatment Case 2

Case 2

A 20 year old girl presented to the clinic with the chief complaint of yellowish discoloration of her front teeth and irregular placement of teeth. Clinical examination (Fig. 4) revealed marked opacity of all the teeth with irregular loss of enamel on the labial surface of maxillary and mandibular anterior teeth and wear of the incisal surface of maxillary and mandibular incisors. The clinical findings were consistent with Thylstrup-Fejerskov Index (TFI) = 5-7. The patient was advised orthodontic treatment for the irregularly placed teeth and the proposed technique for the management of discoloration. A definitive treatment for the esthetic correction can be planned after the orthodontic treatment if the patient desires.

Clinical Protocol

This is a minimally invasive technique aimed to achieve a uniform color to that of the remaining opacious enamel. The teeth were cleaned with non fluoridated pumice (Proxyt RDA 36, medium, IvoclarViviadent). Any defined areas surrounding the areas of lost enamel were rounded to make them shallower so that on application of the material it would blend into so no margins would be visible. The teeth were isolated, etched with 37% phosphoric acid (Tetric N Etch, Ivoclar Vivadent) and bonded (Tetric N Bond, Ivoclar Vivadent). A small amount of A1 and A3 opaque shade Monopaque (Ivoclar Vivadent) was mixed with A1, A2, A3 shade flowable composite (Tetric N Flow, Ivoclar Vivadent) in a ratio as was required to achieve the desired level of opacity to match the color of individual

teeth and applied on the areas to be covered, blended onto the margins and light cured. Any excess was finished with a fine grit diamond point and polished to achieve a smooth surface.

DISCUSSION

The treatments for dental fluorosis should be aimed at improving the esthetic appearance and at the same time be conservative in tooth removal. This technique is more of an additive dentistry rather than reductive dentistry except that any defined areas surrounding the areas of lost enamel were rounded to achieve an indistinguishable margin. In both the cases, the outcome (Fig. 5, Fig. 6, Fig. 7) was a smooth external surface eliminating the ragged pitted surfaces and having a similar pattern of color. The outcome was well accepted by the patients and felt that the appearance of their teeth was much better than what they had presented with. This technique can be used in cases of dental fluorosis with pitting type where the loss of surface enamel is limited to focal areas or less than half the surface (TFI = 5-7). In cases of dental fluorosis associated with brownish discoloration where veneering of the teeth or crowns are advised, this technique can be used as a sub-opaquing technique (Lowe *et al*., 2005) to minimize the removal of tooth structure during tooth preparation to mask the underlying stained surface. Many different opaquers are available in the market. Monopaque is a light-curing opaquer used to mask exposed metal surfaces during the repair of defective ceramic or composite veneers. Monopaque (Ivoclar Vivadent) is available in three shades -- X-white opaque, A1 opaque, A3 opaque. Monopaque has a high degree of opacity if used alone. So it was mixed with the flow able composite. The flowable composite will act as a carrier and allows for proper blending for an indistinguishable margin. It will also create a diluent effect to reduce the opaqueness of the monopaque and prevent the blotchy appearance. The treatment modality adopted in this case presentation can be considered as transitional if the patient needs time to consider a more esthetic treatment approach or an accepted treatment modality if the patient is not critical for further improvement.

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