

Enamel Micro Abrasion: A Cost Effective Approach For Esthetic Rehabilitation of Dental Fluorosis

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ABSTRACT

Introduction: Fluoride is the most important caries-preventive agent in dentistry but excess quantities of the same can be detrimental. The effects of fluoride on enamel formation causing dental fluorosis in man are cumulative, rather than requiring a specific threshold dose, depending on the total fluoride intake from all sources and the duration of fluoride exposure.

Case Report: This case report aims at discussing the Etio-pathogenesis of dental fluorosis and clinical management of the esthetically objectionable appearance of teeth affected by this endemic disease.

Conclusion: The current evidence demonstrates that when a diagnosis of fluorosis has been made, the majority of cases are mild or very mild and do not require restorative treatment, moderate to severe condition require combinations of micro-abrasion with bleaching and for severe fluorosis cases adhesive restorative materials are required to fulfill the patient's aesthetic desires.

Keywords: Esthetic Rehabilitation, endemic disease

INTRODUCTION

Micro abrasion using a paste made of acid and pumice is a technique that has been used to remove white, yellow and brown stains from enamel.^{1,2} In 1986, Croll and Cavanaugh advocated a regimen to remove fluorosis like stains from the teeth that consisted of up to 15 separate five second applications of a thick paste made of 18 percent HCl mixed with a fine pumice powder, followed by 10-second water rinses.³ Microabrasion technique was advised to the patient that can remove stains from within the outermost layer of tooth enamel. This technique presents a favorable and lasting aesthetic result, without causing significant enamel structural loss and without need for cavity preparations. Microabrasion is effective, safe and may be used in order to improve the aesthetics of children and adolescents, as long as the patient is cooperative. This technique causes reduced wear of tooth surface and minimum discomfort to the patient for many years some dentists have advocated the application of hydrochloric acid as an effective method for destaining mottled enamel.⁴ Mcc losky described a technique, originally advocated by kane, that used 18% hydrochloric acid on the affected enamel surfaces. croll and cavanaugh advocated a modified procedure that they called enamel color modification by controlled hydrochloric acid-pumice abrasion. In their method, after the tooth or teeth are carefully isolated with a rubber dam and proper preparations have been made for safe use of the caustic agent, a slurry of fine pumice and 18% hydrochloric acid is applied under pressure and abrasion with a wooden stick. the slurry is rinsed away after each 5-second application until the desired color change has occurred. after a final rinsing with water, 1.1% neutral sodium fluoride gel is

applied for 3 minutes.⁵

CASE REPORT

A male patient aged 10 years came with the chief complaint of dark brown staining of the anterior teeth. Least invasive, cost-effective treatment was the primary concern of the patient for the enhancement of esthetics. Dean's Fluorosis Index (Table 1) was the diagnostic criteria used, which showed moderate fluorosis staining. The most significant staining occurring on the maxillary anterior teeth contained dark brown streaks in the middle third of the facial surfaces. After the procedure was completed, fluoride gel application was placed on the teeth to reduce the postoperative sensitivity. The rubber dam was removed for the evaluation of the result by the patient. The patient was quite satisfied with the results. In the above mentioned cases, patients were asked not to smoke, eat, or drink anything that could possibly stain the teeth for 24–48 hours after the treatment.

Table 1. Deans fluorosis index.⁶

1. Normal:- The enamel represents the usual translucent semivitriform type of structure. The surface is smooth, glossy, and usually of a pale creamy white colour.
2. Questionable:- The enamel discloses slight aberrations from the translucency of normal enamel, ranging from a few white flecks to occasional white spots. This classification is utilized in those instances where a definite diagnosis of the mildest form of fluorosis is not warranted and a classification of "normal" is not justified.
3. Very mild:- Small, opaque, paper-white areas scattered irregularly over the tooth but not involving as much as 25% of the tooth surface. Frequently included in this classification are teeth showing no more than about one to 2mm of white opacity at the tip of the summit of the cusps of the bicuspids or second molars.
4. Mild:- The white opaque areas in the enamel of the teeth are more extensive but do not involve as much as 50% of the tooth.
5. Moderate:- All enamel surfaces of the teeth are affected, and the surfaces subject to attrition show wear. Brown stain is frequently a disfiguring feature
6. Severe:- Includes teeth formerly classified as "moder-

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How to cite this article: Gaurav Kumar Mittal, Hansika Pahuja. Enamel micro abrasion: a cost effective approach for esthetic rehabilitation of dental fluorosis. International Journal of Contemporary Medical Research 2016;3(3):904-905.



Figure-1: Pre-Operative Intraoral View



Figure-2: Enamel Microabrasion With 18% HCL, Pumice Slurry



Figure-3: Post Operative Intra Oral View

ately severe and severe.” All enamel surfaces are affected and hypoplasia is so marked that the general form of the tooth may be affected. The major diagnostic sign of this classification is discrete or confluent pitting. Brown stains are widespread and teeth often present a corroded-like appearance.

DISCUSSION

Dental fluorosis, resulting from excessive intake of fluoride during tooth development is caused by hypomineralisation of enamel with a characteristic feature of diffuse opacities on the enamel surface and has a bilateral symmetric distribution of the enamel defects. Duration, timing, and intensity are the determining factors dependant on the fluoride concentration. The mildest form presents with small white streaks and the mottled enamel. With the increase in its severity, appearance of black and brown stains are seen. This technique is an excellent method to remove intrinsic enamel stains of any etiology, colour and correction of superficial irregularities on the

buccal aspect of enamel.⁷

The difficulty in the determination of the real depth of intrinsic stains or surface irregularities, the application of this technique should always be considered before any restorative procedures. Maintenance of oral hygiene and caries prevention methods was advised to the patients. Tooth discoloration and staining due to fluorosis is an aesthetic problem for certain patients. There are a range of restorative interventions that can be used to change the appearance of fluorosed teeth.⁸ A follow up of two months showed absence of any staining or discolouration of the teeth. For the case presented in this article, a minimally invasive treatment option of microabrasion is the best choice.

CONCLUSION

Enamel microabrasion could remove stains from within the outer most layer of tooth enamel, thereby improving the appearance of the teeth. For mild fluorosis discoloration and for moderate/severe fluorosis, treatment to change the aesthetic appearance of the teeth can be accomplished with minimally invasive treatment using microabrasion or in case of moderate-severe condition, combinations of microabrasion with bleaching can be done to provide the patient with an aesthetically acceptable results. For more severe fluorosis with dark discolorations and surface pitting, adhesive restorative dentistry may be necessary to fulfill a patient's aesthetic desires.

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Source of Support: Nil; Conflict of Interest: None

Submitted: 05-02-2016; Published online: 02-03-2016