



Enamel Micro abrasion: An Effective Method for Improving Esthetics - A Case Series

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Abstract

Aesthetics is frequently a prominent concern among young patients with anterior teeth involvement, which can be a problem to the dentist. Patients usually seek dental treatment to improve their smile because of superficial stains and enamel abnormalities. Hypoplasia, amelogenesis imperfecta, mineralized white patches, and fluorosis are all causes of these stains or abnormalities, for which enamel microabrasion is recommended. Enamel microabrasion can be used to cure superficial imperfections and certain intrinsic stains on dental enamel surfaces, however treatment must be limited to the enamel surfaces' outermost areas. Enamel microabrasion can improve the appearance of teeth by removing enamel flaws and discolouration issues. The current treatment protocol of enamel microabrasion as a minimally invasive therapy technique for mild to moderate fluorosis cases with the lesion in the superficial enamel layers is shown in these cases.

Keywords: Enamel Microabrasion; Mild Fluorosis; Enamel Stains; Moderate Fluoride

Introduction

Aesthetics is a major concern for young patients, and it can be difficult for dentists to address. Teeth discolouration is common in the general population. Many attractive smiles are ruined by discolouration or staining, which can occur on a single tooth or over the entire mouth. Enamel discolouration is caused by hypermineralization, hypomineralization, or staining. Any of these terms are

the result of an anomaly in the inorganic component of the enamel during amelogenesis [1].

Dental fluorosis can occur as a result of continuous endogenous fluoride ingestion that exceeds the recommended daily dose of 1 ppm. The enamel of the tooth may change to varying degree depending on the amount of fluoride consumed [2]. Since Mc Kay and G. V. Black described the effect of fluoride on teeth in 1916, it has

been well documented that fluoride can have both good and harmful effects on the dentition. The topical impact of fluoride once the teeth have erupted in the oral cavity is principally responsible for its positive effects on dental caries. Conversely, harmful consequences are caused by systemic absorption during tooth growth, which causes dental fluorosis, one of the most frequent types of enamel demineralisation [3].

A chronic fluoride-induced disorder in which enamel growth is interrupted and the enamel is hypomineralized is classified as "dental fluorosis," a specific disturbance in tooth creation and an aesthetic problem. White spots, brown stains, white opaque lines or striations, or a white parchment-like appearance of the tooth surface are all signs of enamel fluorosis. Fluorosis is distributed symmetrically, however the severity varies depending on the type of tooth. Premolars, for example, have a higher fluorosis prevalence and are more seriously affected [4].

Microabrasion/macroabrasion, bleaching, composite restoration, veneers, or full crowns are some of the treatment options available, depending on the individual case. Enamel microabrasion is the ideal treatment for the aesthetic enhancement of stains associated with mild to moderate fluorosis [5]. The clinical appearance of mild cases with opaque white patches was improved by microabrasion of the enamel and vital bleaching of the teeth. However, in moderate and severe situations, a combination of enamel microabrasion and vital bleaching is the most common conservative technique. When severe dental fluorosis with profound enamel flaws is present, restorative procedures will be used [6].

The purpose of this case series is to describe and discuss cases of mild to severe dental fluorosis treated with Antivet placed over inactive brown patches on maxillary anterior teeth using a chemical microabrasion technique. Antivet Kit its the perfect ally for eliminate stains due to fluorosis, smoking or drinking dark sodas, wine and coffee. This kit is also recommended as a pre ortho treatment to have better bracket adhesion in dental pieces affected by fluorosis.

Antivet is supplied with a 10 ml bottle of enamel cleaning solution and a 10 ml bottle of neutralizing solution, rubber dams, brush applicators, a palette for the solutions, and the manufacturer's instructions for use. It is a one-visit treatment for the removal of brown stains.

Case History

Case report 1

A 26-year-old male patient presented to the department of conservative dentistry and endodontics at Narsinhbhai Patel Dental College and Hospital Visnagar's Department of Conservative Dentistry and Endodontics with the chief complaint of discoloured upper front teeth. There were no major signs and symptoms, and the past medical history was non-contributory. The facial surfaces of the maxillary central incisors and lateral incisors had inherent brown stains on clinical examination (Figure A). It was classified as mild to moderately severe fluorosis according to Dean's fluorosis index.

In this case we used commercially available Antivet Solution kit (dental enamel cleaning kit) by MDC Dental for enamel microabrasion. Following oral prophylaxis, teeth were isolated using a heavy body rubber dam sheet with interproximal wedjets to protect sensitive tissues from strong acid.

Enamel cleaning solution, a stabilised 21% hydrochloric acid solution, was gently rubbed on the stains with a brush applicator until it changed colour. The agent penetrates the fluorotic enamel prisms, leaches out the fluoride ions, and decreases the stains as a result of the combination of mechanical rubbing and acid's chemical activity. To achieve the desired outcomes, three 5-minute applications were completed.

Then the neutralising solution (which helps to neutralise any remaining acid on the teeth) was applied to the teeth for 2 minutes and then wiped away. After removing the rubber dam, the teeth were polished with a composite polishing kit. The patient was satisfied with the final outcome (Figure D).

For maintenance, the patient was given an over-the-counter whitening toothpaste for two weeks, and post-operative instructions were given after the procedure was completed. There has been no sensitivity or relapse in the stains in the case follow-up for 6 months after therapy.

Case report 2

With cosmetic concerns, a 30-year-old male patient was admitted to Narsinhbhai Patel Dental College and Hospital Visnagar's Department of Conservative Dentistry and Endodontics. Brown stains were found on the upper central incisors. Both central inci-

sors had crack lines in the axes. Mild brown stains were visible on the other anterior teeth (Figure B). White stains were visible on the posterior teeth. The aim was to offer the patient an attractive smile while keeping in mind least invasive treatments, and duration of procedure and the patient's budget. So, we decided to perform microabrasion as the final treatment. Oral prophylaxis was performed, followed by tooth isolation using a heavy body rubber dam sheet. On the Vita Tooth guide 3D Master scale, the colour of the right central incisor tooth was judged to be 4R.

Then, according to the manufacturer's instructions, a gingival barrier gel was applied to the contours of the gums, followed by the application of the Antivet Enamel Microabrasion kit. The microabrasion method was performed three times for a total of five minutes. After the procedure, a neutralising solution was administered to the teeth to alleviate postoperative discomfort. The color of the tooth was determined as 2M on the Vita Tooth guide 3D Master scale (Figure E).

For the next two to three days, the patient was told not to smoke or eat or drink anything that could discolour his teeth. To avoid sensitivity, he was also told to avoid eating or drinking anything that was very cold or too hot for a few days. The aesthetics acquired were pleasing to the patient.

Case report 3

A thirty-year-old male patient reported to the department of Conservative Dentistry and Endodontics with the primary complaint of dark brown staining of his anterior teeth (Figure C). He also desired a minimally invasive, cost-effective treatment to improve his aesthetics. Dean's Fluorosis Index determined that he had moderate flourosis staining based on the appearance of his teeth. The most significant staining occurring on the maxillary anterior teeth contained dark brown streaks in the middle third of the facial surfaces. Before the procedure, oral prophylaxis was carried out. the rubber dam was isolated using heavy body rubber dam sheet.

The same procedure for the microabrasion was repeated using Antivet Solution kit (dental enamel cleaning kit). The 1st solution, a stabilised solution of 21% hydrochloric acid, was rubbed on the stains using a cotton pellet until the cotton pellet changed colour. To achieve the desired results, 3 applications for 5 min each was done. After that the 2nd solution in the kit (helps to neutralise any remaining acid on the teeth) was applied on the teeth for 2 minutes before being washed off (Figure F).

The number of sittings required varies according to the severity of the stains. After completion of the treatment rubber dam was removed. The patient was pleased with the outcome.



Figure A-C: Pre Operative view.



Figure D-F: Post Operative View.

Discussion

The aesthetic appearance of the teeth, which is crucial for a beautiful smile, is valued by people of all ages and genders. Aesthetic difficulties, according to Welbury and Shaw, can have a psychological impact on patients, particularly teenagers, and can interfere with their social lives [7].

In cases with white, yellow, or brown stains in the outer enamel layer, enamel microabrasion is deemed effective. When dealing with fluorosis, it's crucial to understand the degree of enamel stains [8]. Enamel microabrasion with acidic and/or abrasive substances produces instant and long-lasting aesthetic effects with minimum enamel loss and post-operative discomfort. Proper patient selection and effective rubberdam isolation are essential for a successful treatment outcome [9]. As Sundfeld, *et al.* have reported a microabrasive product was used in the case report to complement the stain removal and the smoothing of the enamel surface. The Prema Compound (Premier Dental Products Co, Norristown, PA, USA) microabrasive product, which is composed of 10% hydrochloric acid associated with silica carbide particles, was used due to its excellent performance in enamel stain removal and in the smoothing of the enamel surface irregularities left by the diamond bur [10-13]. The previous application of the fine-tapered diamond bur allowed for two or three applications of the microabrasive product, which is usually required to achieve the desired esthetic effect.

Conclusion

Enamel microabrasion appears to be a minimally invasive approach for permanently reducing moderate fluorosis stains without inducing sensitivity in the patient, resulting in long-term outcomes. For removing superficial enamel stains and flaws, the treatment is considered a safe, conservative, and atraumatic method.

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Conflicts of Interest

There are no conflicts of interest.

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