

MICROABRASION - A MINIMALLY INVASIVE APPROACH TO MANAGE MILD TO MODERATE FLUOROSIS CASES : A CASE REPORT

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ABSTRACT

Aesthetics is a primary concern for most people when they smile and being minimally invasive while treating enamel surface irregularities and stains is the primary concern for the operating dentist. Bleaching, resin based restorations and Porcelain laminate veneers are also treatment modalities¹ that can be used for correction of enamel surface lesions in specific clinical scenarios. This case report describes enamel microabrasion as a minimally invasive treatment modality for mild to Moderate fluorosis cases where the lesion is in superficial enamel layers.

Keywords: Microabrasion, Mild Fluorosis, Moderate Fluorosis.

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INTRODUCTION

Dental Fluorosis is a condition of the teeth characterised by cosmetic defects like white or brown stains, minor surface irregularities or even marked pitting on the surface of the teeth. It usually occurs due to over exposure to fluoride during the formative years of the dentition. Discolourations in enamel are commonly seen in general population².

The Dean's Classification System for Dental Fluorosis (1942)³ helps in classifying the prevailing clinical situations in the following way:

Normal

The enamel represents the usual translucent semivitriform type of structure. The surface is smooth, glossy and usually of pale creamy white colour.

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 used in those instances where a definite diagnosis is not warranted and a classification of 'normal' not justified.

Very Mild (10-25% of surface)

Small, opaque, paper white areas scattered irregularly over the tooth but not involving as much as approximately 25% of the tooth surface. Frequently included in this classification are teeth showing 1-2mm of white opacity at the tip of the summit of the cusps, of the bicuspids or second molars.

Mild (25-50% of surface)

The white opaque areas in the enamel of the teeth are more extensive but involve as much as 50 percent of the tooth.

Moderate (100% of surface)

All enamel surfaces of the teeth are affected and surfaces subject to attrition show wear. Brown stain is frequently a disfiguring feature.

Severe (100% of surface)

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 appearance.

The aim of this case report is to show the decision making and planning involved while treating a case of mild to moderate enamel fluorosis.

Summary of Case and Diagnosis :

A 40yr old female patient came to the clinic complaining of unattractive appearance of her smile. She had routine prophylaxis done and had a lot of post-op sensitivity.

On examination: (Fig 1, 2, 3)

We noted brown stains on the two central inci-



Fig.1 : Pre op smile



Fig.2 : Pre op.



Fig.3 : Pre op.

sors. There were crack lines in both central incisors in the axes. The other anterior teeth showed mild brown stains. Posterior teeth showed white stains as well. Oral hygiene was good. There was a composite restoration on the left lateral incisor. Lower anterior teeth had more value than the upper teeth. The Dean's classification for the case was mild to moderate fluorosis without any pitting on the enamel surface.

Treatment Objectives:

The main objective was to give the patient an aesthetic smile considering minimally invasive techniques, time of treatment and budget of the patient.

Treatment Options:

1) Porcelain Laminate Veneers would be colour stable and a long term solution to our patient's problem. It would mean preparing the teeth by 0.5-1mm to remove the stained, fluorosed enamel and additional lab costs. There could be post operative sensitivity. The time taken for the treatment would also be a factor. If the patient's aesthetic expectations were extremely high, this would be our 1st line of treatment.

2) Composite Veneers to replace the stained enamel with a brighter shade would also yield good aesthetic results in the short term with lower costs to the patient. Long term colour stability, maintenance, repeated repair and/or polishing would be needed.

3) Bleaching the teeth to increase the value of the teeth could be a part of the pre-treatment regimen if the patient chose the above restorative options. Many times brown stains change to chalky white stains post bleaching. Post operative sensitivity was to be expected and the change in shade would not be permanent. Usually a relapse of shade is seen within 2 yrs. Home bleaching could also be done by the patient after microabrasion for improved aesthetic results⁴. Maintenance would be needed every year for the same.

4) Microabrasion using an acidic solution would help in removing the surface stains on the enamel in a minimally invasive way⁵. The results would depend on the depth of the stain in the tooth. Stain removal would be permanent and not recur. There is usually no post

operative sensitivity. Treatment can be completed in one sitting if the aesthetic results are acceptable to the patient. Post treatment home bleaching can be done for better aesthetic results.

Final Treatment Plan:

Microabrasion was the final treatment agreed upon by the patient and the team.

Treatment Protocol:

The commercially available Antivet Solution by MDC Dental was used for enamel microabrasion in this case. The upper anterior teeth were isolated using a heavy body rubber dam sheet (Fig 4). Inverting the dam and securing it with floss ties on the teeth is important to make sure the acidic solution does not leak and burn the soft tissues. Oral prophylaxis using a pumice paste and a brush was done to remove the biofilm (Fig 5). The 1st solution, a stabilised solution of 21% hydrochloric acid, was rubbed on the stains using a cotton pellet till the cotton pellet changed colour. The combination of mechanical rubbing and the chemical action of the acid causes penetration of the agent into the fluorotic enamel prisms, leaches out the fluoride ions and reduces the stains. A total of 3



Fig.4 : Isolation



Fig.5 : Prophylaxis

applications for 5 min each was done to get the desired results (Fig 6,7,8) . The 2nd solution in the kit (helps to neutralise any remaining acid on the teeth) was applied on the teeth for 2 min and washed off (Fig 9). The rubber dam was removed and the teeth were polished using a composite polishing kit. The final result made the patient very happy (Fig 11). Though it was

suggested, she did not want to use a home bleach kit post operatively to get brighter teeth. The patient was given an over the counter whitening toothpaste for 2 weeks for maintenance. The case follow-up has been for 8 months post treatment at the time of writing this article, there has been no sensitivity or any relapse in the stains.



Fig.6 : Microabrading solution-1st application



Fig.7 : After 2nd application



Fig.8 : After 3rd application



Fig.9 : Application of Neutralising solution



Fig.10 : Immediate post op



Fig.11 : Polishing



Fig.12 : Post op



Fig.13 : Pre op smile



Fig.14 : Final smile

DISCUSSION

The correct diagnosis of intrinsic enamel stains can be challenging. If an individual consumes too much fluoride in his/her formative years, it could result in brown or white discolourations in the superficial enamel layer⁶. Microabrasion, Bleaching, Composite resin restoration and Porcelain laminate veneers can be used to treat the appearance of the fluorosed teeth depending on the clinical situation, in some cases in combination as well⁷. Enamel microabrasion using acidic and/or abrasive agents gives immediate and permanent aesthetic results, with minimal loss of enamel and post op sensitivity⁸.

CONCLUSION

Microabrasion is a minimally invasive technique to permanently reduce mild fluorosis stains without causing sensitivity to the patient. The key to acceptable treatment outcome is proper case selection and effective rubber dam isolation.

Disclaimer

Some of the photographs have been tilt-corrected and cropped. No other digital editing has been done to any of the photographs. The author has no commercial interests in any of the companies making the materials used for the case.

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