Case Report **Open Access**

Esthetic and Cost Effective Management of Young Female with Moderate Fluorosis Using Microabrasion;

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ABSTRACT:

Primary concern of majority of young patients visiting dental OPD is compromised dental esthetics or dental pain. Discolorations have significant social and esthetic effects. Fluorosis is one of the most common cause. It is prevalent in different areas of Pakistan. Microabrasion was selected for treatment of discoloration in this case report. Microabrasion was performed using slurry made by combining 37% phosphoric acid and pumice. This slurry was applied on the labial tooth surface and mechanically rubbed with a prophylaxis brush in a slow hand piece for a minute, with gentle pressure. The cycle was performed thrice followed by fluoride application. The results of this conservative treatment were satisfactory and patient was satisfied with the esthetic outcome.

Keyword: Esthetics, Dental Microabrasion, Tooth Discoloration,

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INTRODUCTION:

Primary concern of majority of young patients visiting dental OPD is either compromised dental esthetics or dental pain. Discolorations have significant social and esthetic effects.[1]

Discoloration could be white, yellow-brown or brown opacities that could be involving the whole dentition or just one tooth. Also they might be intrinsic or extrinsic in nature. Extrinsic stains could be because of tobacco usage, food dyes or due to plaque and calculus accumulation. Whereas intrinsic stains may be due to tetracycline staining, dental fluorosis, developmental problems like dentinogenesis and amelogenesis imperfecta or even due to injuries.[2]

Fluorosis is one of the most common causes of staining. It is prevalent in different areas of Pakistan where the fluoride content is high in drinking water, according to literature conducted in 2020 shows 100% prevalence among the subjects which were exposed to 6-8mg/dl where as 17.4% in subjects exposed to fluoride levels of 0.30mg/dl.[3]

There are different treatments options available for the fluorosis depending upon the severity and depth. The severity of fluorosis can be evaluated as per Dean's index. Stains that are present on the outer layers of the enamel could be corrected by conservative methods like microabrasion. If stains are deeper than other treatment options like bleaching with hydrogen peroxide, direct veneering or crowns may be opted.[4] One of the most time consuming, costly and non-conservative methods available are ceramic veneering which may be used for deeper stains.[5]

The microabrasion is second most conservative technique after bleaching that removes the porous enamel layer and the stains by rubbing acid gel and an abrasive compound. The defect is removed by a combination of erosive and abrasive effects of the mixture. This should be the first option for management of teeth with intrinsic stains because it is safe and minimally invasive, also it can be combined with bleaching when necessary.[6, 7] In this case report microabrasion is used for the correction of patients staining.

Case Report:

A 24-year old girl came to the BUMDC dental OPD with presenting complaint of brown discoloration of teeth. She had esthetic concerns and felt under confident due to the stains. She said she hardly smiles with her teeth show. Her medical history was non-significant. But her childhood house was supplied by a well and its water contained slightly high levels of fluoride as her siblings also had similar staining.

Upon examination, yellowish-brown stains were found on

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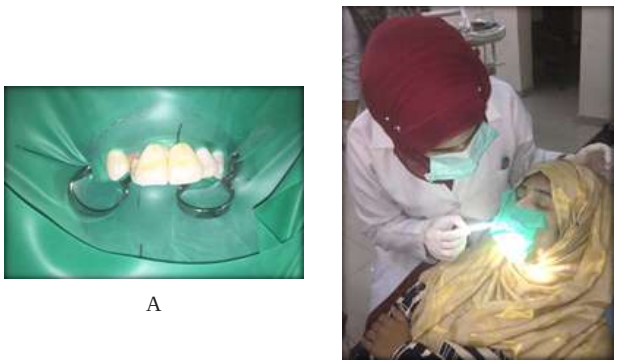
Figure 1:
A: Pre-operative intraoral clinical photograph showing frontal view of case of moderate fluorosis
B: Pre-operative intraoral clinical photograph showing lateral view of case of moderate fluorosis

A B

Figure 2:
A: Rubber Dam isolation before application of slurry made of 37% phosphoric acid and pumice
B: Clinical photograph showing application of slurry made of 37% phosphoric acid and pumice



A B

Figure 3: Post-operative Clinical Photograph after microabrasion and fluoride application

her upper anterior teeth, especially on the centrals according to the Deans index of 4 indicating moderate fluorosis. Her oral hygiene was good with restorations in her upper molars and missing lower molar. Radiographically, all the maxillary anterior teeth displayed a uniform PDL space and intact lamina dura. The colour and texture of the lesions led to the diagnosis of mild to moderate dental fluorosis. (Fig 1)

The patient and her parents were provided with treatment options of bleaching, microabrasion and partial veneering. Patient opted for microabrasion only. She was explained. She agreed to go ahead with it. At the initial visit, pictures were taken and isolation was achieved by rubber dam. (Fig 2) Next, 37% phosphoric acid and pumice made into slurry was applied on the labial tooth surface and mechanically rubbed with a prophylaxis brush in a slow hand piece for a minute, with gentle pressure. This cycle was performed thrice. Between each cycle the teeth were washed and dried. After final evaluation, flouride varnish (Duraphat® Fluoride Varnish Woelm and Pharma, Eschwege, Germany) was applied. Post-operative pictures taken.(Fig 3)

Following microabrasion, the brown opacities on the maxillary central incisors became less obvious but were still visible. The patient and her parents were given post-operative instructions and instructed to avoid food and drinks with colouring for the next two days.

The patient was called on a follow-up visit after 3 months. The brown opacities although were still present but were not as prominent as they were before treatment. The treatment option was not the ideal but, the patient was very happy with the results.

DISCUSSION:

For many years, micro abrasion has been the technique of choice for management of dental fluorosis.[8] It produces an enamel loss ranging between 25-200 micrometers. Also it produces a prism-free enamel surface that reflects and refracts light in such a way that the surface seems smooth, regular and lustrous.[9]

The technique of micro abrasion possess minimal risks and its side effects are close to rare (unless the patient doesn't follow the post-operative instructions). Comparatively the procedure is very simple, good results are frequently observed with minimal harm to the dentition therefore resulting in its success.[10]

In some cases, vital bleaching is practised after micro-abrasion. Since after micro-abrasion, teeth can have a slightly yellowish appearance because dentin shows through the translucent enamel, therefore bleaching is used to enhance the results.[11] A randomised control trial was conducted by Balan B et al in 2013, which compared micro-abrasion with and without bleaching for patients with fluorosis. It came to a conclusion that there was no difference in outcomes of both techniques. Although it does summarizes that a combination of two techniques is an effective way of reducing enamel fluorosis staining and also patient satisfaction was better when both techniques were used. [12]

In the present case report the patient was provided with the treatment of micro-abrasion, which was performed by using the materials available in the OPD including 37% phosphoric acid gel mixed with pumice to create a slurry. This material was used as it was easily available and cost effective at the same time and the process was completed almost in an hour.

Studies show that microabrasion can provide satisfactory results in mild to moderate fluorosis[13] but for the best outcomes microabrasion can be combined with bleaching and resin infiltration. Resin infiltration shows immediate improvement of esthetics by changing the refractive index of deeper hypo mineralised layers. The patient was quite happy with the immediate results as the stains at upper maxillary teeth lightened with this technique. Hence,enamel micro-abrasion is very effective method with minimal intervention

CONCLUSION:

This case report demonstrates that conservative method of microabrasion can successfully treat the esthetic appearance caused by fluorosis. But while formulating a treatment plan, patient's wishes and conservation should be a priority.

In this case at the end of the treatment, an extremely pleasant esthetic result was observed along with patient satisfaction.

Authors Contribution:
Umeed Jawaid: Write up
Muhammad Rizwan Nazeer: Study design
Ayesha Jawed: Write up
Meisha Gul: Proof Read

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