

CONSERVATIVE MANAGEMENT OF ANTERIOR TEETH DISCOLORATION THROUGH A SEQUENTIAL APPROACH OF MICROABRASION AND BLEACHING – A CASE REPORT

Dr. Kurchi Mandal*

ABSTRACT

Discolored teeth affect the appearance of the individuals making them seek correction for same. Discoloration of anterior teeth can be due to a variety of reasons including genetic and environmental factors. This article describes correction of discolored teeth due to fluorosis utilizing combination of two conservative treatment approaches - microabrasion and in-office vital bleaching. The proposed technique improved the esthetics without requiring other invasive restorative procedures.

KEY WORDS

Teeth Discoloration, Esthetic treatment, Dental Fluorosis, Microabrasion, Vital bleaching technique.

ABOUT THE AUTHORS

*Assistant Professor
Department of Conservative Dentistry and Endodontics
Dr. R. Ahmed Dental College and Hospital, Kolkata, India

CORRESPONDING AUTHOR

Dr. Kurchi Mandal
Assistant Professor
Department of Conservative Dentistry and Endodontics
Dr. R Ahmed Dental College and Hospital
Phone no.: 9831342570, e-mail id: kurchi_best@yahoo.com

INTRODUCTION

Anterior teeth serve an important role in facial esthetics. Discolored teeth can have an immense impact on confidence of an individual impacting social interactions¹. Dental professionals bear the responsibility to improve patient's smile in most conservative and effective way.

Tooth discoloration has been described by Vogel as intrinsic and extrinsic². Intrinsic stains may result from pulpal necrosis, dental fluorosis, tetracycline induced stains, inherited developmental anomalies of enamel and dentin, haematological factors and aging³.

Dental fluorosis is a developmental disturbance of enamel caused by successive systemic exposure to high concentrations of fluoride during tooth development, leading to enamel with lower mineral content and increased porosity. The hypomineralized teeth usually appear with white mottling or opaque surface or discrete to generalized yellow-brown discolorations on the labial surface.

Treatment options for correcting the discolored teeth can be bleaching, micro-abrasion, macro-abrasion, veneering or by placement of crown⁴. However, a minimally invasive technique is always appreciated as most patients seeking esthetic treatment are young adults and invasive procedures may cause excessive loss of tooth structure at an early age^{5,6}.

This article discusses a case of dental fluorosis managed by a combination of conservative techniques i.e micro abrasion followed by vital bleaching procedure thereby avoiding more invasive procedures like veneers and crown..

CASE REPORT: Discoloration of teeth managed by microabrasion followed by vital bleaching

A twenty-two years old female patient reported in the Department of Conservative Dentistry & Endodontics of Dr. R Ahmed Dental College and Hospital for aesthetic improvement of discolored upper anterior teeth.



Fig 1. Pre-operative picture



Fig 2. Microabrasion Paste



Fig 3. Post Microabrasion



Fig 4. Bleaching agent



Fig 5. Application of bleaching agent



Fig 6. Final Result

The patient presented with yellow-brown stains & white flecks on labial surface of maxillary anterior teeth (Fig 1). The probable cause was diagnosed as moderate dental fluorosis. The treatment options were discussed with the patient and was finalised to go for microabrasion procedure first and further treatment, if required.

Rubber dam was placed to isolate the teeth to be treated. A layer of petroleum jelly was applied between the rubber dam & gingival to protect the soft tissue.

The procedure was performed with an abrasive paste containing Silicon carbide microparticles in water-soluble paste and 6.6% Hydrochloric acid (Opalustre Ultradent Products Inc) (Fig 2). Protective glass should be worn by the patient to shield the eyes from any spatter. A layer of about 2 to 3 mm paste was applied on the affected teeth with hand applicator. A low-speed hand piece was used for application of the abrasive paste to reduce the possibility of removing too much tooth structure and to prevent spatter. The tooth surface was microabraded with moderate to light pressure for 60-120 seconds. Intermittent water rinses and inspection was done to determine whether additional applications are required. For this patient, the procedure was repeated 3 times.

After final evaluation (Fig3), topical fluoride solution (2% Sodium Fluoride) was applied. The patient was asked to report for follow up after 1 week.

During follow up visit after discussion with the patient, in-office vital bleaching procedure was carried out using 35% hydrogen peroxide (Florence, Prevest DenPro) (Fig4 and Fig 5). The procedure was done in three applications lasting for fifteen minutes and irrigation between the applications. The patient was asked to report after 1 week for follow up.

As the patient was satisfied with the result (Fig6), no further treatment was done.

DISCUSSION

There are various treatment modalities for management of moderate dental fluorosis which include micro and/or macro abrasion, in-office vital bleaching, night guard vital bleaching, laser assisted bleaching and/or combination techniques⁷.

In 1984, McCloskey⁸ reported the use of 18% hydrochloric acid swabbed on teeth for the removal of superficial fluorosis stains. Subsequently, in 1986, Croll and Cavanaugh⁹ modified the technique to include the use of pumice with hydrochloric acid to form a paste applied with a tongue blade. This technique is called microabrasion and involves the surface dissolution of enamel by the acid along with abrasiveness of pumice to remove superficial stains or defects.

Croll¹⁰ further modified the technique, reducing the concentration of the acid to approximately 11% & increasing the abrasiveness of the paste using silicon carbide particles instead of pumice.

Microabrasion procedure is recommended for the treatment of fluorosis, post-orthodontic demineralization, localized hypoplasia & idiopathic hypoplasia where discolouration is limited to the outer enamel layer¹¹ or enamel defects that do not extend beyond a few tenths of a millimetre in depth¹².

Advantages of this technique include very minimal tooth structure removal, lack of sensitivity and post-operative pain, no need for dental cavity preparation for restorative materials and shorter time

required for the procedure and easy to execute.¹¹

The amount of enamel removed by the procedure is related to the duration of applications, the number of applications and the pressure applied to the tooth during the procedure in addition to the concentration of acid.¹³

A study by Machado LS et al. have concluded that microabrasion followed by vital bleaching is an excellent and successful clinical technique for establishing esthetic results on several cases of enamel fluorosis eliminating the use of other invasive procedures¹⁴.

According to Celik et al. though microabrasion improves the appearance of the teeth with brown stains, combination of microabrasion and bleaching results in better aesthetics.¹⁵

In the proposed technique we have performed microabrasion to remove the un-aesthetic stained enamel under rubber dam protection followed by application of a fluoride varnish. Fluoride application has two roles: first, it reduces the risk of post-treatment sensitivity, and second, it protects the teeth from possible external demineralization¹⁶.

CONCLUSION

Although there are multiple treatment options for discolored teeth, the choice depends on the nature and severity of the condition. Many patients who require treatment for dental fluorosis are young adults and the use of invasive procedures such as veneers or crowns causes sacrifice of tooth material, thus accelerating the destruction of the tooth at an early age. Furthermore, a restorative approach is time consuming and relatively expensive. So, microabrasion followed by bleaching procedure, the minimally invasive technique may be offered and applied first since they are extremely conservative, well accepted by patients, less expensive and no special maintenance are required.

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