



## International Journal of Applied Dental Sciences

ISSN Print: 2394-7489  
ISSN Online: 2394-7497  
IJADS 2019; 5(2): 407-411  
© 2019 IJADS  
www.oraljournal.com  
Received: 20-02-2019  
Accepted: 22-03-2019

**Dr. Nandhini Ambalavanan**  
MDS, Associate Professor,  
Department of Conservative  
dentistry and Endodontics  
Tamil Nadu Government Dental  
College and Hospital, Chennai,  
Tamil Nadu, India

**Dr. Srilekha Jayakumar**  
Senior lecturer, Department of  
Conservative dentistry and  
Endodontics Sri Venkateshwara  
Group of Institutions Sri  
Venkateshwara Dental College  
and Hospital, Ariyur,  
Puducherry, India

**Dr. Aruna Raj**  
MDS, Associate Professor,  
Department of Conservative  
dentistry and Endodontics  
Tamil Nadu Government Dental  
College and Hospital, Chennai,  
Tamil Nadu, India

### Ultraconservative treatment modalities for management of discoloured tooth: Case reports

**Dr. Nandhini Ambalavanan, Dr. Srilekha Jayakumar and Dr. Aruna Raj**

#### Abstract

Discolouration of the anterior tooth causes considerable cosmetic impairment to a patient. Intrinsic stains are particularly difficult to manage with techniques like bleaching alone. Combination techniques are effective in selective patients depending on the severity of discolouration. This article describes the efficient management of discolouration of patients using ultra-conservative combination techniques that reduces the chair time and prevents loss of tooth structure.

**Keywords:** Discolouration, microabrasion, bleaching, macroabrasion, combination techniques, topical fluoride

#### Introduction

Discolouration of anterior teeth can cause considerable cosmetic impairment, psychological and social impact on a patient. Vogel introduced two categories for tooth discolouration as intrinsic and extrinsic [1]. Watts *et al* has introduced a third category called internalised discolouration. Intrinsic strains may result from pulpal necrosis, dental fluorosis, tetracycline induced stains, inherited developmental anomalies of enamel and dentin, haematological factors and aging [2]. Treatment modalities for managing discolorations include bleaching, micro abrasion, macroabrasion porcelain veneers and crowns. The main problem with invasive procedure is that most patients are young adults wherein the use of invasive procedures may result in excessive loss of tooth structure at an early age [3, 4]. The improvement in the field of conservative dentistry has paved a way for a new dimension in the dental treatment of patients with discoloured anterior teeth. Thus there has been a tendency towards conservative approaches even in severely fluorosed tooth. In accordance with the principles of bio mimetics every effort should be made to preserve the structural integrity of the tooth [5].

The aim of this clinical case report is to determine the clinical situations that do not require ceramic veneering and can be managed by ultra conservative techniques and combination techniques that do not violate the subtle balance, where the combination of enamel dentin demonstrate in maintaining the structural integrity of the tooth structure.

#### Case Report I

A twenty five years old female patient reported to the Department of Conservative Dentistry with the complaints of stains in upper front teeth since the eruption of permanent teeth. Clinical examination revealed brown stains that were hard, pitted and intrinsic in nature. Patient was provisionally diagnosed as enamel hypoplasia with moderate discolouration affecting the anteriors (fig 1). As the stains were moderately brown involving the superficial enamel and the difficulty of the patient to report for multiple sittings, the patient was offered the option of enamel microabrasion followed by vital bleaching of the upper anteriors. After getting the patient's consent, oral prophylaxis was done, petroleum jelly was applied to protect the soft tissues. Following rubber dam isolation, microabrasion was done using a slurry of 18% HCl and pumice using a rubber cup in a contra-angle hand piece at low speed (fig 2, 3). At the same appointment in office vital bleaching was done using 30% hydrogen peroxide with the help of an applicator. The procedure was done in three applications lasting for four minutes and one minute irrigation between the applications (fig 4). After obtaining the desired aesthetic result, topical fluoride (Flour protector) was applied for four minutes (fig 5, 6).

#### Correspondence

**Dr. Nandhini Ambalavanan**  
MDS, Associate Professor,  
Department of Conservative  
dentistry and Endodontics  
Tamil Nadu Government Dental  
College and Hospital, Chennai,  
Tamil Nadu, India

## Case Report II

A twenty three year old male patient reported to the Department of Conservative Dentistry with the complaints of discolouration of upper teeth ever since eruption of his permanent teeth. Clinically the stains were dark brown, hard with white opaque areas and intrinsic in nature. The patient was provisionally diagnosed as enamel hypoplasia with severe discolouration affecting the anteriors (fig 9). After determining the degree of staining, which was severe, it was decided to go for macroabrasion treatment followed by an in office vital bleaching procedure. The patient was explained about the treatment protocol and the patient's consent was obtained. Under rubber dam isolation, macroabrasion was done using 12 & 30 fluted tungsten carbide bur (fig 10). After this procedure, in-office vital bleaching was done using Mc-Innes solution (1 part of 0.2 % diethyl ether + 5 parts of 36 % HCl + 5 parts of 30 % hydrogen peroxide) (fig 11). The patient underwent two sittings of vital bleaching in a week interval of three minutes application of bleaching agent followed by irrigation. Finishing and polishing of the tooth were done. Topical fluoride (Fluor protector) application was done in the final sitting to avoid post-operative sensitivity (fig 12).

## Discussion

Different modalities for management of discoloured tooth include in office vital bleaching, night guard vital bleaching, laser assisted bleaching, micro and macro abrasion and combination techniques [6]. Combination techniques are particularly useful in treating moderate to severe discolorations that are not amenable to bleaching alone. Moderate discolouration involving the superficial enamel can be resolved with microabrasion and bleaching particularly when the patient cannot come for multiple sittings. Enamel microabrasion technique associated with dental bleaching is an excellent and successful clinical technique for re-establishing esthetics of severe case of enamel fluorosis eliminating the use of dental restoration. Microabrasion involves removal of small amount of enamel surface and incorporating both abrasion with the help of dental instruments and erosion with the acid mixture. Controversy exists whether or not high concentration of hydrogen peroxide can cause morphological changes in the enamel. A study by Sundfeld *et al.* have concluded that enamel microabrasion with vital bleaching is an excellent clinical procedure for re-establishing aesthetics in case of severe enamel fluorosis,

eliminating the use of adhesive restoration with minimal loss of enamel [7].

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 [10]. Long term effectiveness of microabrasion has been clinically proven in several studies with minimal post-operative and intra operative discomfort like dentinal hyper sensitivity [8, 9]. Microabrasion followed by polishing with a fluoride prophylactic paste provides better surface smoothness and better hardness of the enamel. These factors are important in determining the amount of residual enamel left after microabrasion and the final appearance of the teeth after bleaching protocol [11].

When the stains are very deep and conservative management strategies are ineffective, macroabrasion is a valuable alternative. Some enamel defects or white spots that do not respond to microabrasion and bleaching may respond better to macroabrasion. Initial macroabrasion removes the superficial layer of fluoride that displays the most unaesthetic colour and defective structure. This procedure eliminated deepest stains in the enamel and minimized clinical chair time [12]. Light intermittent pressure with careful monitoring of removal of tooth structure will avoid irreversible damage. Both the procedures are less time consuming negating the use of local anaesthesia with the high degree of patient satisfaction. If defects or discolouration remain after treatment, a restorative technique is indicated [13]. Though in office bleaching procedure may remove stains without removing deeper enamel, they have the disadvantage of multiple office visits and overall cost. Some enamel defects and stains respond better to combined therapy of removing intrinsic stains using macroabrasion and in office bleaching.

A combined chemo mechanical approach may be considered as an interesting alternative to more invasive prosthetic techniques like veneers, provide better aesthetic and possible cost reduction to the patient [14, 15]. Microabrasion in combination with in office vital bleaching technique is beneficial in treating mild discolorations, whereas severe discolorations can be treated with macro abrasion and composite restorations. Further to avoid post operative hypersensitivity topical application of fluoride is effective. Studies have concluded that remineralization of bleached enamel can be improved by the application of high concentration of topical fluoride [16].



Fig 1: Pre-operative photograph



Fig 2: Isolation



**Fig 3:** Microabrasion



**Fig 4:** In-office vital Bleaching



**Fig 5:** Fluoride varnish



**Fig 6:** Varnish application



**Fig 7:** Pre-operative photograph

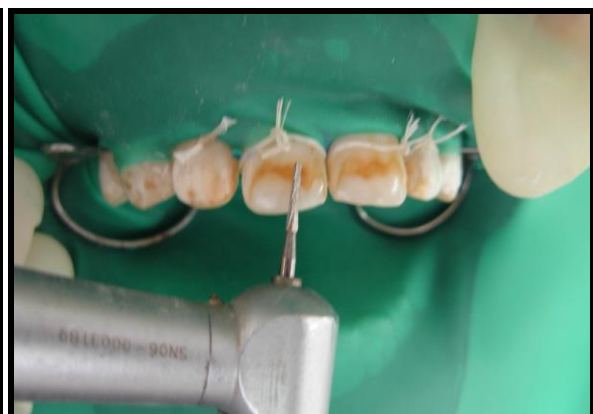


**Fig 8:** Post-operative photograph

**Case 1: Microabrasion and Bleaching**



**Fig 9:** pre-operative photograph



**Fig 10:** Macroabrasion



**Fig 11:** In-office vital bleaching



**Fig 12:** Fluoride application



**Fig 13:** Pre-operative photograph



**Fig 14:** Post-operative photograph

**Case 2: Macroabrasion and Bleaching**

**Conclusion**

The application of ultra conservative treatment modalities should always precede a more sophisticated treatment plan. From the patients perspective conservative techniques are less expensive and a satisfactory. Before resorting to a invasive protocol, effort should be made to restore the tooth structure. The procedures that maintain the biomechanical, structural and esthetic integrity of the tooth should always be the treatment option instead of opting for a more sophisticated treatment plan.

**References**

1. Vogel RI. Intrinsic and extrinsic discoloration of the dentition (A literature review). *J Oral Med.* 1975; 30(4):99-104
2. Watts A, Addy M. Tooth discolouration and staining: a review of the literature. *Br Dent J.* 2001; 190(6):309-16.
3. Sundfeld RH, Franco LM, Gonçalves RS, de Alexandre RS, Machado LS, Neto DS *et al.* Accomplishing esthetics using enamel microabrasion and bleaching - a case report. *Oper Dent.* 2014; 39:223-7.
4. Sundfeld RH, Rahal V, Croll TP, De Alexandre RS, Briso AL. Enamel microabrasion followed by dental bleaching for patients after orthodontic treatment - case reports. *J Esthet Restor Dent.* 2007; 19:71-77.
5. Ermis RB, Ugurlu M. A case report on fluorosed teeth whitening without microabrasion - Is it possible?. *J Res Dent* 2015; 3:83-7.
6. Sa Y, Sun L, Wang Z, Ma X, Liang S, Xing W *et al.*

- Effects of Two In-Office Bleaching Agents with Different pH on the Structure of Human Enamel: an In Situ and in vitro study. *Oper Dent.* 2013; 38(1):100-10.
7. Sundfeld RH, Croll TP, Briso AL, Alexandre RS, Sundfeld Neto D. Considerations about enamel microabrasion after 18 years. *Am J Dent.* 2007; 20:67-72.
8. Machado LS, Sundfeld Neto D, Oliveira GB, Carvalho TC, Oliveira FG, Sundfeld RH. Combining enamel microabrasion and dental bleaching: recovering smile aesthetics. *Dent Today.* 2013; 32:110-1.
9. Rodrigues MC, Mondelli RF, Oliveira GU, Franco EB, Baseggio W, Wang L. Minimal alterations on the enamel surface by microabrasion: in vitro roughness and wear assessments. *J Appl Oral Sci.* 2013; 21:112-7.
10. Celik EU, Yildiz G, Yazkan B. Comparison of enamel microabrasion with a combined approach to the esthetic management of fluorosed teeth. *Oper Dent.* 2013; 38:134-43.
11. Nahsan FP, Silva LM, Baseggio W, Franco EB, Francisconi PA, Mondelli RF *et al.* Conservative approach for a clinical resolution of enamel white spot lesions. *Quintessence Int.* 2011; 42:423-426.
12. Paula A, Santos PH, Oliveira FG, Machado LS, Neto DS, Sundfeld RH. Integrating techniques to restore an adolescent's smile. *Dent Today.* 2012; 31(3):88, 90-91.
13. Reston EG, Corba DV, Ruschel K, Tovo MF, Barbosa AN. Conservative approach for esthetic treatment of enamel hypoplasia. *Oper Dent.* 2011; 36:340-343.
14. Rodrigues MC, Mondelli RF, Oliveira GU, Franco EB,

- Baseggio W, Wang L. Minimal alterations on the enamel surface by micro-abrasion: in vitro roughness and wear assessments. *J Appl Oral Sci.* 2013; 21:112-117.
15. Chhabra N, Singhal KP. Viable approach to manage superficial enamel discoloration. *Contemp Clin Dent.* 2010; 1:284-287.
  16. Celik EU, Yildiz G, Yazkan B. Clinical evaluation of enamel microabrasion for the aesthetic management of mild-to-severe dental fluorosis. *J Esthet Restor Dent.* 2013; 25:422-430.