

Restoration of Anterior Teeth Using Minimal Invasive Esthetic Techniques with Opalusture and Composite Restoration: A Clinical Technique



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Discoloration is one of the important reasons for restoration of anterior teeth in esthetic zone. Dental fluorosis is among common discoloration. Main reason for fluorosis is that concerned person residing in area with high fluoride content in community drinking water supply. In this case report, a 45 year old male patient reported with esthetic concern due to discoloration in anterior teeth which was in turn diagnosed to be fluorosis and eventually treated with minimal invasive techniques including combination of microabrasion, macroabrasion and direct composite veneers.

KEYWORDS: Fluorosis, Tooth discoloration, Enamel microabrasion, Dental veneers

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INTRODUCTION

Tooth discoloration is a dental condition, which affects teeth either intrinsically or extrinsically. The field of cosmetic dentistry was introduced to address such esthetic issues of the patient. There are two types of discoloration intrinsic and extrinsic. Among them fluorosis is a common reported discoloration in areas of high water fluoride content in water supply.^{1,2}

Dental fluorosis primarily affects the anterior esthetic dental zone. Enamel opacities are created in the affected area due to decrease mineral content both in deep and superficial areas. Basic mechanism behind this discoloration is retard activity of ameloblast during enamel matrix formation and the enamel mineralization stages. Such discolorations are white in color in initial stages brown in severe cases, which is esthetically displeasing to patient. The frequency of these defects ranges between 8.3 and 51.6%.^{3,4}

For correction of discoloration associated with enamel defects especially fluorosis, minimal invasive dentistry approaches were opted. It includes tooth bleaching procedures, microabrasion, macroabrasion and direct veneering techniques.⁵ Superficial mild defects of fluorosis are treated with the help of microabrasion technique, which uses abrasive particles along with prophylactic cups on tooth surfaces. Macroabrasion involves the use of bur for removing discolored area in case of more severity. Some cases involve

the hybrid technique of minimal invasive dentistry.⁶ In this report, we describe a patient with moderate DF who was successfully treated with a minimally invasive esthetic technique, including enamel microabrasion, macroabrasion and direct composite veneers.

CASE REPORT

45 year old male patient resident of Lahore from moderate socio economic status reported to Out patient diagnosis of Operative department Rawal Institute of Health Sciences on 1st July 2021. He complained of brown patches in his anterior maxillary teeth and wanted to improve their color and appearance. The problem was here for 10 years. Patient gave history of fall 30 years before. He started noticing change in color of the teeth with patches for 5-6 years. He underwent root canal treatment of one anterior tooth 3 years back. Medical and drug history were non contributory. Extraoral clinical examination was normal. On intraoral examination, gingiva and soft tissue mucosa were normal. On examination of dentition there was mild staining in all anterior teeth along with brown discoloration in middle third of #11, #12, #21 with normal investigations and teeth were vital. All other teeth were normal with no obvious finding and good oral hygiene. Radiographic examination showed normal periodontal support. Occlusal examination patient showed normal bilateral class I molar occlusal relationship. Definitive diagnosis was of brown discoloration due to past trauma history of primary predecessors teeth of #11, #12, #21 (Fig 1,2).

Minimal invasive treatment option were considered as

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Figure 1,2: Brown discoloration of the maxillary central permanent incisors and laterals

initial modality including microabrasion with opalusture of #11,#12,#21. If the color was removed with this treatment no further treatment was planned, however if it stays then direct composite veneers options will be considered and proposed to patient. The plan was explained as a whole to the patient and informed consent was taken.

In the initial step, teeth were cleaned with pumice paste, Pre shade matching of the teeth were done, which was found to be A3, it was done after cheek retraction. Rubber dam isolation of the concerned teeth along with flowable composite further improving the gingival seal was done (Fig 3,4,5).



Figure 3,4,5: Preshade matching, Rubber dam isolation, Flowable composite layer to improve the seal

Superficial teeth layer were freshened off with bur provided in opalusture kit. Opalusture kit was used for microabrasion (Figure 6,7,8). A slurry mixture (Opalustre, Ultradent Products, Inc., South Jordan, UT, USA) was placed labially



Figure 6,7,8: Superficial hypermineralized layer removed for fresh underlying substrate, Opalusture material, rubber cups provided with the kit

on brown discolored area of incisors. Then rubbed off with rubber cups, provided with in the kit.⁵ applications of opalusture was done. (Figure 9,10,11). Minimally macroabrasion was also performed on these teeth with water-cooled fine tapered diamond bur (no. 3195 FF; Mani Inc., Utsunomiya, Japan) (Figure 12,13). Shade was matched



Figure 9,10,11: Opalusture Application along with rubber cups



Figure 12,13: Minimal macroabrasion on centrals and repeat of micro abrasion steps on lateral incisors

again. Teeth were then restored with direct composite veneers. Teflon tape was used for protecting the adjacent teeth. Teeth were finished and polished in final step and compared with pre treatment photograph (Figure 14,15,16,17,18).



Figure 14,15,16: Steps of bonding were performed, Etch with phosphoric acid 37% etchant, wash, dry, apply bonding agent 2 step total etch and rinse, 5th generation



Figure 17,18: Pre and post treatment photographs. Teeth were finished and polished in final step.

DISCUSSION

Oftenly minimal invasive dentistry procedures for esthetic improvements such as microabrasion produces satisfactory result for the patient.⁷ These procedures remove superficial enamel defects and hence improve esthetics. Procedure of microabrasion involves use of acid such as 18% hydrochloric acid in combination with slurry of pumice. It removes 100 µm of superficial enamel layer. In present case lower concentration of hydrochloric acid 6.6% abrasive microparticles of silicon carbide were used. Enamel microabrasion using acidic/abrasive products is a noninvasive, conservative, and a time-saving approach which gives

immediate and permanent esthetic results to patients.⁸

Minimal veneer preparation (0.3 mm cervical third, 0.5 mm middle third, 0.7 mm incisal third, no incisal and no interproximal reduction) was done that allows to conserve tooth structure with supragingival margins.⁹

In recent year ,new materials with improved mechanical and esthetic properties are introduced in the market IPS Empress Direct is a universal nano hybrid filling material for direct esthetic restorative procedures that is claimed by the manufacturers to combine the esthetic qualities of ceramics as well as convenient handling characteristics of composites providing high polishability and life-like fluorescence to the restoration.^{5,10,11} Present case use nano hybrid direct filling material for restoration of the concerned teeth of patient. Hence giving improve results.

CONCLUSION

Combination of minimal invasive dentistry techniques for improving teeth appearance is a good option to address cases with mild to moderate discoloration.

REFERENCES

1. Philippa Hoyle, Lyndsey Webb and Peter Nixon Severe Fluorosis Treated by Microabrasion and Composite Veneers. 2017. Dent Update 2017; 44: 93-98
<https://doi.org/10.12968/denu.2017.44.2.93>
2. Meireles SS, Goettems ML et.al. Dental Fluorosis Treatment Can Improve the Individuals' OHRQoL? Results from a Randomized Clinical Trial. .Braz Dent J. 2018;29:109-116.
<https://doi.org/10.1590/0103-6440201801733>
3. Wang Q,Meng Q,Meng J. Minimally invasive esthetic management of dental fluorosis: a case report.J Int Med Res. 2020;48
<https://doi.org/10.1177/0300060520967538>
4. GencerMDG,KirziogluZ.A comparison of the effectiveness of resin infiltration and microabrasion treatments applied to developmental enamel defects in color masking. Dent Mater J. 2019;38:295-302.
<https://doi.org/10.4012/dmj.2018-074>
5. Nevárez-Rascón M, Molina-Frechero N et.al.Effectiveness of a microabrasion technique using 16% HCL with manual application on fluorotic teeth: A series of studies.World J Clin Cases. 2020;8:743-56.
<https://doi.org/10.12998/wjcc.v8.i4.743>
6. Celik EU, Yazkan B, Yildiz G, Tunac AT.Clinical performance of a combined approach for the esthetic management of fluorosed teeth: Three-year results..Niger J Clin Pract. 2017 ;20:943-951.
<https://doi.org/10.4103/1119-3077.180066>
7. Gaião U, Pasmadjian ACP et al. Macroabrasion and/or Partial Veneers: Techniques for the Removal of Localized White Spots..Case Rep Dent. 2022
<https://doi.org/10.1155/2022/3941488>
8. Hasmun N, Lawson J et.al.Change in Oral Health-Related Quality of Life Following Minimally Invasive Aesthetic Treatment for Children with Molar Incisor Hypomineralisation: A Prospective Study. Dent J (Basel) 2018;6:61.
9. Dua P, Londhe SM, Dua G, Kotwal A, Gupta S .Clinical evaluation of "componees" and direct composite veneers using minimally invasive enamel preparation technique: In vivo study.J Indian Prosthodont Soc. 2020;20:424-430.
https://doi.org/10.4103/jips.jips_95_20
10. Shahroom NSB , Mani G , Ramakrishnan M. Interventions in management of dental fluorosis, an endemic disease: A systematic review. J Family Med Prim Care. 2019;8:3108-113.
https://doi.org/10.4103/jfmpc.jfmpc_648_19
11. Somani C, Taylor GD, Garot E, Rouas P, Lygidakis NA, Wong FSL. An update of treatment modalities in children and adolescents with teeth affected by molar incisor hypomineralisation (MIH): a systematic review. Eur Arch Paediatr Dent. 2022;23:39-64.
<https://doi.org/10.1007/s40368-021-00635-0>