

Microabrasion: A Treatment Option For White Spots

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The aim of the present study was to describe a clinical protocol for the treatment of white spots with the use of an abrasive material. A four-year-old patient presented with a white spot on tooth 51 and a white spot associated with a carious lesion in the cervical region of tooth 52. Treatment was planned with microabrasion and restoration of the upper right lateral incisor. Prophylaxis was first performed, followed by protection with a dental dam and the application of the abrasive material (silicon carbide and hydrochloric acid 6%). Five applications were needed to remove the spots. The restoration of the upper right lateral incisor was then performed with a resin composite. A good esthetic outcome was achieved and both the patient and her guardians were satisfied with the results. Microabrasion is a conservative treatment option that achieves satisfactory results with regard to tooth color.

Key words: Enamel Microabrasion, Child, Treatment

INTRODUCTION

Defects and discoloration in the primary dentition occur during tooth development and appear in the form of hypoplasia, opacities or hypomineralization.¹ Hypoplasia is produced by a disturbance in the formation of the matrix of the organic enamel and is clinically visible as spots, tiny cracks, pits and fissures in the enamel.² Treatment in such cases involves the removal of the surface spots through bleaching, microabrasion, stratification and prosthetic rehabilitation in the form of porcelain crowns.³

Microabrasion is a conservative treatment option in cases of intrinsic enamel spots and discoloration.⁴ This method improves the coloration of the teeth by eliminating the outer dysplastic layer of the enamel.⁵ Microabrasion can be used in combination with

in-office bleaching, resulting in a better esthetic outcome.⁶ Studies have demonstrated satisfactory results with microabrasion in the opinion of both dentists and patients alike^{7,8} and the combination with other techniques tends to improve the results.

In cases of carious lesions, the reestablishment of esthetics is achieved with the choice of the most appropriate restorative materials that meet the patient's needs as well as the consideration of risk, patient age, cavity size and the possibility of isolating the affected area for preparation.⁹ Resin composites are commonly used on both anterior and posterior teeth.¹⁰ These materials can also be used on defects and discolorations, thereby reestablishing the harmony of the teeth as well as patient self-esteem.¹¹

This paper describes a clinical protocol for the treatment of white spots with the use of an abrasive material (microabrasion method) on a pediatric patient.

Case Report

A four-year-old male visited the Pediatric Dentistry Specialization Clinic in the city of Macéio, Brazil, for treatment. The clinical exam revealed a white spot on tooth 51 and another associated with a carious lesion in the cervical region of tooth 52 (Figure 1). The treatment plan was microabrasion combined with restorative treatment for the right lateral incisor.

The teeth were cleaned with a Robinson brush and fluoride toothpaste, followed by protection of the region with a dental dam (Top Dam, FGM, São Paulo, Brazil) (Figure 2). Microabrasion was performed with a silicon carbide-based material and hydrochloric acid at a concentration of 6% (Whiteness RM, FGM, São Paulo, Brazil). The material was applied with a microbrush (Figure 3) and mechanical friction was performed with a rubber cup at low speed. The abrasive procedure lasted approximately 15 seconds. The teeth were then rinsed with water and the procedure was performed again.

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Five applications of the abrasive material were necessary for the complete removal of the spots.

The dental dam was removed (Figure 4) and restoration of the maxillary right lateral incisor was performed with a composite resin, the color of which was selected from a scale. The cavity was prepared with acid etching and removal of the carious tissue, followed by the application of the Ambar bonding system (FGM, São Paulo, Brazil). The restorative material of choice was Opallis B 0.5 (FGM, São Paulo, Brazil). Finishing and polishing of the restoration were performed with the Diamond Flex disk and Diamond R polishing paste (FGM, São Paulo, Brazil). The esthetic outcome of the anterior teeth proved satisfactory to both the patient and his guardians (Figure 5).

DISCUSSION

The present report describes the successful clinical outcome of microabrasion and demonstrates the importance of the esthetics of anterior teeth to pediatric patients. Indeed, esthetics is currently a fundamental aspect of dentistry. However, a number of factors should be taken into consideration when treating children, such as medical history, degree of cooperation, age, the risk of caries, parental preferences and cultural norms regarding esthetics.¹²

Previous clinical reports in the literature also describe successful results with the combination of microabrasion and resin composite restoration.^{2,4,13} In one study, the authors found that the combination of these two techniques allowed a significant improvement in the appearance and color uniformity of the teeth as well as the reestablishment of patient self-esteem. The authors also stress the need for the proper diagnosis in cases of discoloration and knowledge of the depth of the lesion. The correct indication of the technique to employ and the prognosis are crucial factors in the treatment decision-making process as well as the successful resolution of the case.⁴

Clinical studies report that microabrasion is often employed in cases of fluorosis,^{6,7} with satisfactory esthetic results achieved, especially when combined with bleaching.⁶ Indeed, Benbachir *et al* (2007) state that due to the limitations of microabrasion, the addition of bleaching can allow achieving the expected result.⁵ In the present study, the decision was made to use a minimally invasive combination of microabrasion and resin composite to protect the vestibular face and raise the patient's self-esteem, as described in previous studies.^{2,4,13} In primary teeth, color merits special attention and color scales should be used during the evaluation of the patient. An *in vivo* study with the aim of recording tooth color in the primary dentition reports that differences in color among teeth in the same patient underscore the need for an individualized approach in the combination of colors.¹⁴

In the present case report, treatment consisted of the execution of two procedures at the same time. When esthetics is an issue, the resolution of the cases is an essential factor. However, the patient described herein also had dental caries, which had a direct affect on the clinical procedures. A previous report evidences this issue, but the case in question involved discoloration and tooth fracture and the authors stress the issue of the returning the proper anatomy to the affected tooth.¹⁵ This was also performed in the present case, as the aim of the restorative procedure was to return health, esthetics and function to the affected tooth, with the appropriate selection of color, followed by the incremental restorative technique.

In conclusion, microabrasion is a conservative treatment option with a satisfactory outcome regarding the improvement in appearance related to tooth color combined with a thin layer of resin composite. Microabrasion allowed the resolution of the white spot, with direct repercussions on the restorative procedure, especially in the obtainment of the final color.

REFERENCES

1. Casanova-Rosado AJ, Medina-Solis CE, Casanova-Rosado JF, Vallejos-Sanchez AA, Martinez-Mier EA, Loyola-Rodriguez JP, et al. Association between developmental enamel defects in the primary and permanent dentitions. *Eur J Paediatr Dent* 12(3):155-8, 2011
2. Martos J, Gewehr A, Paim E. Aesthetic approach for anterior teeth with enamel hypoplasia. *Contemp Clin Dent* 3(Suppl 1):82-5, 2012
3. Khatri A, Nandlal B. An indirect veneer technique for simple and esthetic treatment of anterior hypoplastic teeth. *Contemp Clin Dent* 1(4):288-90, 2010
4. Reston EG, Corba DV, Ruschel K, Tovo MF, Barbosa AN. Conservative approach for esthetic treatment of enamel hypoplasia. *Oper Dent* 36(3):340-3, 2011
5. Benbachir N, Ardu S, Krejci I. Indications and limits of the microabrasion technique. *Quintessence Int* 38(10):811-5, 2007
6. Celik EU, Yildiz G, Yazkan B. Comparison of enamel microabrasion with a combined approach to the esthetic management of fluorosed teeth. *Oper Dent* 38(5):134-43, 2013
7. Sinha S, Vorse KK, Noorani H, Kumaraswamy SP, Varma S, Surappaneni H. Microabrasion using 18% hydrochloric acid and 37% phosphoric acid in various degrees of fluorosis - an *in vivo* comparison. *Eur J Esthet Dent* 8(3):454-65, 2013
8. Wong FS, Winter GB. Effectiveness of microabrasion technique for improvement of dental aesthetics. *Br Dent J* 193(3):155-8, 2002
9. Donly KJ. Restorative dentistry for children. *Dent Clin North Am* 57(1):75-82, 2013
10. AAPD. American Academy of Pediatric Dentistry. Guideline on pediatric restorative dentistry. *Pediatr Dent* 34(5):173-80, 2012
11. Chambers CP, O'Morain D, Keightley A, Welbury RR. A case report of green pigmentation in the permanent dentition. *J Dent Child (Chic)* 79(3):189-92, 2012
12. Gosnell ES, Thikkurissy S. Management of dental caries and esthetic issues in the pediatric patient. *J Calif Dent Assoc* 41(8):619-29, 2013
13. de Araujo EB, Zis V, Dutra CA. Enamel color change by microabrasion and resin-based composite. *Am J Dent* 13(1):6-7, 2000
14. Kim J, Paravina R, Chen JW. *In vivo* evaluation of color of primary teeth. *Pediatr Dent* 29(5):383-6, 2007
15. Chafaie A. Minimally invasive aesthetic treatment for discolored and fractured teeth in adolescents: a case report. *Pract Proced Aesthet Dent* 16(4):319-24, 2004

MICROABRASION: A TREATMENT OPTION FOR ENAMEL HYPOPLASIA

Figure 1: Initial aspect of upper right central lateral incisor with white spot and upper right lateral incisor with white spot associated with carious lesion in cervical region



Figure 2: Clinical aspect of teeth after prophylaxis and placement of dental dam



Figure 3: Clinical aspect following application of abrasive material



Figure 4: Aspect of upper right central and lateral incisors (51 and 52) following microabrasion



Figure 5: Final appearance of teeth following microabrasion and restoration with resin composite

