

## Direct composite restoration for anterior teeth with enamel hypoplasia: An aesthetic approach

Ashique M<sup>1</sup>, Elizabeth Prabha James<sup>2</sup>, Jayasree S<sup>3</sup>, Sruthipoornima<sup>1</sup>, Ajeesh K<sup>1</sup>

<sup>1</sup> Junior Resident, Department of Conservative Dentistry and Endodontics, GDC Calicut, Kerala, India

<sup>2</sup> Associate Professor, Department of Conservative Dentistry and Endodontics, GDC Calicut, Kerala, India

<sup>3</sup> Professor and HOD, Department of Conservative Dentistry and Endodontics, GDC Calicut, Kerala, India

### Abstract

Enamel hypoplasia is a developmental defect of the enamel that is produced by a disturbance in the formation of the organic enamel matrix, clinically visible as enamel defects. Disorders that occur during the stages of enamel development and maturation reduce the amount or thickness of the enamel, resulting in white spots, tiny grooves, depressions and fissures in the enamel surface. The complexity and intensity of the dental deformity lesions will conduct the ideal treatment-associating conservative techniques. This article presents a case report of restorative treatment of enamel hypoplasia using micro hybrid composite resin to mask colour alteration and enamel defects. An aesthetic appearance that respects the tooth polychromatic and the self-esteem of the patient can be achieved with this approach.

**Keywords:** direct composite, anterior teeth, enamel hypoplasia

### Introduction

Tooth eruption begins after completing certain stages of development. During this phase, the formation of dental tissues; enamel, dentin and cement may not be fully completed due to some external or internal factors, resulting in developmental anomalies. The anomalies especially located at anterior region is a major concern in terms of aesthetics.

In dentistry, the concept of aesthetics is extremely subjective and is related to beauty, harmony and the needs of the patient. The interactions between new restorative materials and techniques allow the reproduction of dental structures, restoring form and function in such a way that restorative procedures become imperceptible [1, 2]. Nevertheless, during the evaluation of aesthetically compromised teeth, we encounter unfavorable clinical situations of great complexity, characterized by deep invasions of the mineralized structures. The reproduction of the optical characteristics of the teeth, such as translucency, opalescence and fluorescence, requires a considerable knowledge of restorative techniques and the materials currently available [3, 4].

This article presents a case report of restorative treatment of enamel hypoplasia using micro hybrid composite resin to mask color alteration and enamel defects of the anterior upper teeth.

### Case Report

A 22-year-old female patient was referred to the department of conservative and endodontics Govt. dental college calicut, reporting a visual discomfort from the presence of irregularities and discoloration in the maxillary incisors. Dental history and clinical examination revealed enamel hypoplasia [Figure 1].



Fig 1

Clinical examination evidenced an enamel defect in the maxillary lateral and central incisors, with rough surfaces with irregular limits that principally involve the cervical third of the crown. The radiographic examination revealed normal periapical area and all the teeth were considered as vital. Minimally invasive preparation followed by single shade composite veneers were selected as the treatment plan. At first appointment the teeth were isolated with rubber dam and microabrasion was done to the teeth numbered 12, 11, 21, 22 with a microabrasive agent (Opalustre, Ultradent) containing 6.6% HCl (hydrochloric acid) and silicon carbide microparticles. A slight enameloplasty, using a spherical 1015F diamond bur (KG Sorensen, São Paulo, Brazil) and manual instruments, was performed on both the irregularities and the limits of the tooth defect. Rubber dam was removed and the teeth were cleaned (Figure 2, 3).



**Fig 2**



**Fig 3**

Firstly, the shade selection was considered by using button technique as A2 shade (polofil supra). Then the cavitated enamel surfaces were etched with 37.5% phosphoric acid (Gel Etchant, Kavo-Kerr, USA) for 30 seconds and the surfaces were rinsed and dried. A universal adhesive agent (Adper Single Bond 2, 3M ESPE, USA) was applied and polymerized for 20 seconds. A2 shade composite resin was applied to whole the prepared surfaces by free-hand layering technique (Figure 4).



**Fig 4**

Surface finishing procedure was done by using a red-banded diamond bur in low speed under water cooling. Marginal contouring and interdental polishing was done with interdental polishing strips I different grain sizes (Shofu, Japan). Surface polishing procedure was done by using polishing discs (shofu, japan)

## Discussion

With the valuation of aesthetics, minimally invasive restorative techniques have provided an expansion of the current conservative philosophy<sup>[1, 6]</sup>. Nevertheless, during the evaluation of aesthetically compromised teeth, we encounter adverse clinical conditions of great complexity, marked by the invasion of the mineralized structures at depth. Enamel hypoplasia is an incomplete or defective formation in the organic matrix of the enamel and remaining certain areas susceptible to decay; it is responsible for a major proportion of lesions. The irregularities present in a hypoplasia provide favorable conditions for the retention of plaque and the early development of caries lesions, which progress and reach deep into the enamel and the dentin<sup>[7]</sup>.

One of the signs of hypoplastic lesions is diminishing enamel luster and dental surfaces that have become eroded with cavitations and irregular wear because of the loss of the microanatomy affecting the color, morphology and texture of teeth. On some occasions, hypoplasia is mistaken for fluorosis; however, enamel hypoplasia is an incomplete or defective formation in the organic matrix of the enamel, triggered by diseases, systemic disorders, trauma and infections in the pulp of deciduous teeth<sup>[6]</sup>. It manifests with partial or complete absence of the enamel, which can be systemic (when it affects a group of teeth) or local (when it has asymmetric distribution and is relegated to a single tooth)<sup>[6]</sup>.

Because it is neither fully transparent nor fully opaque, the enamel is a tissue whose optical characteristics are not easily reproduced. Some modern composites provide optical similarities consistent with natural teeth<sup>[3]</sup>, yielding satisfactory levels of opalescence, value and chroma<sup>[4]</sup>.

It is important to consider that the final restoration is dependent on both the thickness and the varying degrees of translucency and opacity of the several layers of the composite. Of all dental structures, enamel seems to be the optical entity that is most difficult to imitate<sup>[3]</sup>. Reston et al<sup>[2]</sup>, describe a minimally invasive technique performed in cases of enamel hypoplasia based on enamel microabrasion and complemented with composite resin restorations. The procedures employed are simple, but they require knowledge of the real causes of the staining and comprehension of restorative techniques.

Various treatment protocols may be performed, depending on the level of involvement and the severity of the lesions. Usually, these approaches include enamel microabrasion, aesthetic conservative restorations and dental whitening<sup>[6, 8]</sup>. Composite resin restorations are fully capable of reproducing the appearance of a natural tooth with highly aesthetic outcomes<sup>[9]</sup>. In this context, the main goal of the treatment of enamel hypoplasia is to re-establish the anatomical harmony between occlusion, function and aesthetics and to restore patient self-esteem, promoting social and psychological benefits.

## Conclusion

In the case presented, the results indicate that the microabrasion, and direct composite restoration combination can be a promising treatment method for Enamel hypoplasia under the conditions of this study

## Source of Support

Nil.

## Conflict of Interest

None declared.

## Reference

1. Baratieri LN, Araujo E, Monteiro S Jr. Color in natural teeth and direct resin composite restorations: Essential aspects. *Eur J Esthet Dent*,2007;2:172-86.
2. Reston E, Corba D, Ruschel K, Tovo M, Barbosa A. Conservative approach for esthetic treatment of enamel hypoplasia. *Oper Dent*,2011;36:340-3.
3. Villarroel M, Fahl N, De Sousa AM, De Oliveira OB Jr. Direct esthetic restorations based on translucency and opacity of composite resins. *J Esthet Rest Dent*,2011;23:73-87.
4. Heller A. Clinical procedures to avoid the 'dark halo' in restorations with direct composite resins. (309-10, 312). *Dent Update*,2011;38:304-6.
5. Musale PK, Yadav T, Ahmed BM. Clinical Management of an Epigenetic Enamel Hypoplasia- A Case Report. *Int J Clin Dent Sci*,2010;1:77-80.
6. Marson FC, Sensi LG, Bertholdo G, Silva CO. Diferenças clínicas e de tratamentos entre a fluorose e a hipoplasia do esmalte. *R Dent Press Estét*,2009;6:52-61.
7. Björndal L, Thysstrup A. A structural analysis of approximal enamel caries lesions and subjacent dentin reactions. *Eur J Oral Sci*,1995;103:25-31.
8. Azevedo DT, Almeida CG, Faraoni-Romano JJ, Geraldo-Martins VR, Palma-Dibb RG. Restorative treatment on permanent teeth with enamel hypoplasia and crown dilacerations caused by trauma to their primary predecessors. *Int J Dent*,2011;10:38-41.
9. Pontons-Melo JC, Furuse AY, Mondelli J. A direct composite resin stratification technique for restoration of the smile. *Quintessence Int*,2011;42:205-11.