

# Enamel hypoplasia with nonsyndromic oligodontia: A rare case report

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## Abstract

Enamel hypoplasia is an exclusive ectodermal disturbance, related to alterations in the organic enamel matrix which can cause white flecks, narrow horizontal bands, lines of pits, grooves, and discoloration of the teeth. It can result in compromised oral health that causes physiological and psychological disturbances. Management of enamel hypoplasia not only includes esthetic and functional rehabilitation of the patient but also requires a positive rapport building with the patient due to psychosocial issues. The present case reports elucidate step-by-step management of 16-year-old female patient who presented with localized enamel hypoplasia with severely decayed anterior teeth, poor dental esthetics, and oligodontia of the lower teeth.

**Keywords:** Esthetics; enamel hypoplasia; oligodontia; rehabilitation

## INTRODUCTION

Enamel hypoplasia is characterized by a reduction in enamel thickness and is considered a quantitative defect. The process of enamel formation is intricate and meticulously controlled.<sup>[1]</sup>

Dental enamel defects can be attributed to a wide range of causes, including genetic and epigenetic factors, systemic conditions, local issues, and environmental influences. Systemic factors such as perinatal or prenatal illnesses, low birth weight, frequent antibiotic use, malnutrition, celiac disease, and respiratory disorders such as asthma have been linked to the development of enamel defects.<sup>[2]</sup>

Enamel defects associated with environmental conditions can be further classified into three categories: (1) hypoplasia, (2) diffuse opacities, and (3) demarcated opacities. Enamel hypoplasia, characterized by pits, grooves, or significant areas of missing enamel, tends

to manifest more frequently in individuals between the ages of 12 and 15, accounting for approximately 68.4% of cases.<sup>[3]</sup> Moreover, this enamel loss typically appears bilaterally symmetrical and aligns well with the stage of development.<sup>[4]</sup> Defects present important clinical significance since they are responsible for, dental sensitivity, predisposition to dental caries, and esthetic problems.<sup>[5]</sup>

Enamel hypoplasia with nonsyndromic oligodontia shows varying prevalence across regions and ethnicities. In Caucasian populations of North America, Australia, and Europe, it is estimated at 0.14%,<sup>[6]</sup> while in Asian populations, it is approximately 0.25%.<sup>[7]</sup> Prevalence also varies by age, with studies from northern Europe showing rates of 0.16% among 9–13 years old and 0.084% among 18 years old. In addition, it is noted to be more prevalent in females than males.<sup>[8]</sup>

The heritability of this condition is influenced by a complex interplay of genetic factors, which can manifest as either autosomal dominant or recessive traits. Furthermore, it is evident that numerous cases involve the combined influence of multiple genetic and environmental factors.<sup>[9]</sup>

This case report presents an unusual instance of localized enamel hypoplasia of maxillary anterior teeth with an

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Figure 1: Preoperative frontal view

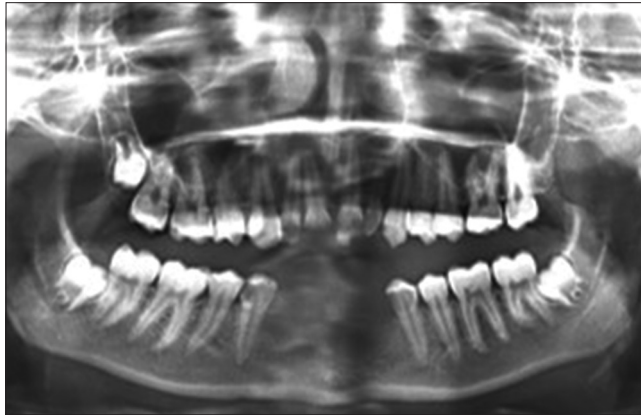


Figure 3: Orthopantomogram



Figure 5: Postoperative frontal view

epigenetic basis, accompanied by oligodontia affecting the mandibular anterior teeth, and describes the clinical management of this condition.

## CASE REPORT

A 16-year-old female patient reported to the department of conservative dentistry and endodontics and was unsatisfied with her smile due to badly broken down upper front tooth region. Clinical examination revealed significant enamel chipping and dentin exposure in teeth 11, 12, 21, 22, 34, and 44, accompanied by generalized enamel opacities. A digital orthopantomogram showed the congenital absence of mandibular anterior teeth (31, 32, 33, 41, 42, and 43). Notably, the patient had no siblings, and her parents had healthy teeth, ruling out hereditary factors [Figures 1-6].

Intraoral periapical radiographs of teeth 12, 11, 21, and 22 displayed radiolucency affecting enamel, dentin, and



Figure 2: Preoperative mandibular occlusal view

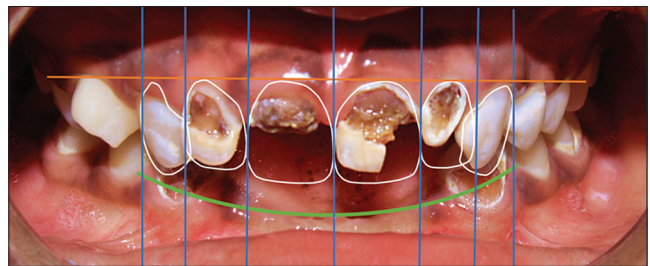


Figure 4: Digital smile designing



Figure 6: Postoperative mandibular occlusal view

pulp, along with widened periodontal ligament spaces. Radiographs of teeth 34 and 44 revealed radiolucency in enamel and dentin, with no periapical changes. Pulp viability testing (cold and electric pulp test) showed negative responses for teeth 12, 11, 21, and 22, but positive responses for teeth 34 and 44.

The patient was diagnosed with localized enamel hypoplasia affecting teeth 11, 12, 21, 22, 34, and 44, in combination with nonsyndromic oligodontia. Differential diagnoses considered and ruled out were ectodermal dysplasia, rampant caries, and amelogenesis imperfecta. Ectodermal dysplasia was excluded due to the absence of involvement in other ectodermal structures, such as the skin and hair. Amelogenesis imperfecta was eliminated as it typically presents in a generalized and genetically derived manner. Rampant caries is a suddenly appearing, rapidly burrowing type of caries resulting in early pulp involvement, in which >10 new lesions appear every year

on healthy teeth surfaces which are generally immune to caries, neither of which were observed in this case.

Digital smile design was employed using a 75% recurrent esthetic dental (RED) proportion, taking into account dental, facial, and general characteristics. Conventional endodontic therapy was performed on teeth 11, 12, 21, and 22, followed by direct composite restoration on teeth 34 and 44. Fiber posts (Medicept Self Post size #2) were used for anterior teeth (11, 12, 21, and 22), with postendodontic restoration using direct composite resin (3M ESPE Filtek Z350). Crown lengthening was accomplished using electrocautery, and tooth preparation was completed with a shoulder finish line. Temporary crowns were fabricated using self-cure acrylic resin (Kulzer MELIODENT Cold Cure), followed by permanent crowns made from lithium disilicate. To address the lower edentulous space in this growing patient, a lower removable partial denture (RPD) was fabricated.

## DISCUSSION

The esthetic changes resulting from hypoplastic lesions in the anterior teeth can potentially lead to psychological and behavioral consequences, impacting the patient's social life due to the alterations in tooth structure that affect the overall appearance of their smile.<sup>[10]</sup> Patients present with these developmental defects of enamel, achieving long-term successful outcomes for the teeth is dependent on establishing a correct diagnosis. To comprehensively address the possibility of defects being associated with an unexamined systemic or genetic condition, it is crucial to take into account the patient's medical history, family history, past dental records, and, if necessary, perform a medical evaluation.<sup>[5]</sup>

Digital smile designing aids in providing patients with a visual preview of the anticipated treatment outcome, boosting treatment predictability. Clinicians can use digital presentations to address patient concerns, motivate them, and educate them about treatment benefits. This approach enhances diagnostic and treatment planning by digitally analyzing facial, gingival, and dental parameters, providing an objective and standardized assessment of the smile and face.<sup>[11]</sup> In this case, the RED proportion was utilized for smile designing, offering practitioners the freedom to choose proportions within a range of 60%–80%, thereby allowing personalized adaptation of tooth characteristics to facial proportions, in contrast to the fixed 62% of the golden proportion.<sup>[12]</sup>

Posts enhance core retention and transfer forces to the root. In this case, a glass fiber-reinforced composite post was used to reduce elastic modulus mismatches between the post, luting agent, core material, and tooth. While fiber

posts do not reinforce tooth structure, they can create a more even stress distribution, reducing the risk of root fractures.<sup>[13]</sup> Chemical bonding between the post and luting cement further minimizes risk. Glass fiber posts can also transmit light, enabling the activation of adhesive materials in the root canal.

Oligodontia is a rare genetic disorder which represents the congenital absence of more than six teeth in primary, permanent, or both dentitions. Partial tooth loss can result in clinical challenges and lifestyle issues, including issues such as overeruption of opposing teeth, drifting of adjacent teeth causing misalignment, speech changes, impact on successor teeth, esthetic concerns with front teeth, development of oral habits, and overall arch integrity. RPD with acrylic denture bases is the most generally perceived choice for restoring the oral structure in adolescents because they can be easily modified as the individual grows.

## CONCLUSION

Enamel hypoplasia presents a significant challenge, impacting both oral health and the overall well-being of individuals. Timely intervention aims to alleviate discomfort and enhance appearance. A multitude of treatment options are available, and this communication serves as a guide for clinicians, aiding in the selection of the most suitable approach for each case. The primary objective in treating enamel hypoplasia is to restore harmonious occlusion, function, and esthetics, ultimately boosting patient self-esteem and fostering social and psychological well-being.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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