



CASE PRESENTATION

Incisor-molar hypomineralization: a case report

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ABSTRACT

Introduction: incisor-molar hypomineralization is a disorder of odontogenesis that produces defects in the mineralization of the enamel of the first permanent molars and that may or may not be accompanied by damage to the permanent incisors, which trigger aesthetic and functional problems.

Objective: describe a clinical case where a patient presents with incisor-molar hypomineralization.

Case presentation: the case of a 6-year-old female patient is presented, who was diagnosed with incisor-molar hypomineralization concomitant with incisor-radicle molar malformation in the primary dentition. A panoramic radiograph was indicated and the decision was made to extract 16 teeth. 5 % sodium fluoride was applied to the remaining first molars and incisors. SMicroabrasion was performed on incisors with marked opacities. This improved the patient's aesthetic and functional condition.

Conclusions: early diagnosis and treatment of MIH minimizes damage and improves the aesthetic and functional impairment that MIH can cause in pediatric patients.

Keywords: Molar Hypomineralization; Molar; Tooth; Dentistry.

INTRODUCTION

Structural enamel defects have become a topic of interest for professionals and a concern for patients affected by them. The clinical signs manifested by patients have motivated researchers to focus on the aesthetic and functional future of individuals whose oral health condition could have significant repercussions on their lives. Literature reports that around 10 % of the population suffers from enamel defects. Among these, hypomineralizations not caused by fluorosis, affecting permanent incisors and molars, began to be reported in the late 1970s by

the Swedish Public Dental Service, which described the increasing incidence, severity, and extent of these lesions.^(1,2)

The European Academy of Pediatric Dentistry (EAPD) was the first international scientific organization to extensively study Molar-Incisor Hypomineralization (MIH). The first policy document was published in 2010 following a seminar organized by the EAPD in Helsinki in May 2009.⁽¹⁾

MIH is the most common enamel alteration, with a rising incidence; it shows no predilection by sex, race, or socioeconomic level.^(3,4) The global average prevalence is estimated at 14,2 % (range 8,1–21,1 %). The lowest rates are reported in Bulgaria and Germany (2,4 %), while in Norway, Finland, and South America the values range between 13 % and 18 %. Spain and Denmark report the highest prevalence rates, 21,1 % and 37,3 % respectively. ^(4,5,6,7,8)

There are cases in which MIH may coexist with Molar-Incisor Radicular Malformation (MIRM), the latter first reported in the scientific literature in 2014. It is generally an incidental radiographic finding that mainly affects the roots of the first permanent molars, the second deciduous molars, and the crowns of the permanent upper incisors. Its characteristics include a normal crown with an anomalous root, a narrow pulp chamber, and immature accessory canals in the furcation area.⁽⁹⁾

In Cuba, only one review article on the topic was found, by Rosales Hinojosa,⁽¹⁰⁾ published in the journal *Elementos* in August 2024, which discussed the etiology, risk factors, and key diagnostic and differential diagnosis aspects of the pathology. Currently, there is insufficient evidence on the incidence or prevalence of MIH in the country, which motivated this study aimed at describing a clinical case of molar-incisor hypomineralization.

CLINICAL CASE REPORT

A six-year-old female patient with a history of allergy, medicated with ketotifen (one tablet at bedtime from six months to four years of age), attended the dental clinic due to her parents' concern regarding severe thermal sensitivity in the upper right first permanent molar (16), unrelieved by analgesics.

During the interview, the mother reported that delivery was by cesarean section due to fetal distress caused by high birth weight and reduced uterine capacity. She also mentioned that the child suffered from frequent colds and otitis before the age of three, twice complicated by pneumonia, which led to multiple treatments with amoxicillin until the patient developed an allergy to penicillins.

On physical examination, the patient presented as normolinear, fair-skinned, with a slightly convex profile, facial symmetry, and proportional thirds. Clinically, she exhibited early mixed dentition. Tooth (16) was newly erupted, showing enamel and dentin fracture, with altered translucency of enamel of normal thickness, well-defined, smooth surface, and intense yellow color. Similar opacities were present in the other three permanent first molars (26, 36, 46), although the color appeared chalky white.

The upper right second primary molar (55) was absent, reportedly exfoliated naturally due to mobility. A panoramic radiograph was ordered to complement the clinical diagnosis and determine the management plan.

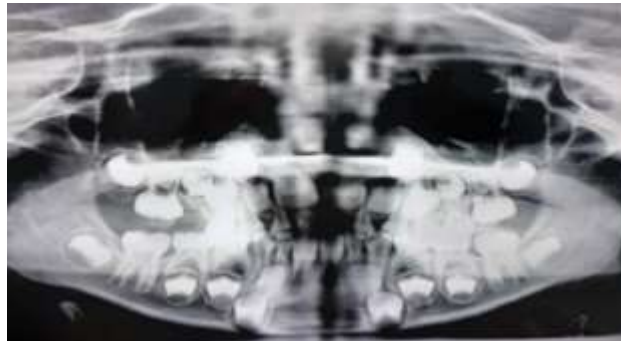


Fig. 1. Panoramic radiograph of the patient.

Note: A typical mixed dentition image is observed, with dental formation and eruptive stage consistent with age, although the lower jaw shows slight advancement compared to the upper.

In the upper arch, absence of the upper right second primary molar (55) is evident. The upper right first permanent molar (16) shows slight mesial migration, shortening arch length and not yet reaching the occlusal plane. The upper left second primary molar (65) shows root resorption, and the upper left first permanent molar (26) has not yet reached occlusion. The primary central incisors (51, 61) are absent, and the permanent central incisors (11, 21) are developing but not yet erupted based on root formation.

In the lower arch, the central incisors (31, 41) and first permanent molars (36, 46) are erupted to the occlusal plane, with more advanced root formation, suggesting earlier eruption. The second primary molars (75, 85) show no premature resorption.

The diagnosis: Acute serous pulpitis in tooth 16, Molar-Incisor Hypomineralization, and Molar-Incisor Radicular Malformation in the primary dentition.



Fig. 2. Extracted upper right first permanent molar (16) due to MIH.

Extraction of tooth 16 was performed due to poor prognosis and the esthetic and functional benefits of its removal.

Subsequent treatment focused on oral hygiene education, proper brushing technique, and promoting healthy dietary habits. The patient was prescribed toothpaste containing at least 1000 ppm fluoride. Dental plaque control was reinforced. A 5 %

sodium fluoride varnish was applied as follows:

- Once weekly for one month
- Once every three months for one year
- Once every six months during the second year ⁽⁶⁾

These measures aimed to promote remineralization of the affected enamel. Upon eruption of the upper incisors, demarcated white opacities consistent with MIH diagnosis were observed (Fig. 3).



Fig. 3. Demarcated opacities in upper and lower incisors.

A microabrasion technique was then performed using a pumice and 37 % phosphoric acid paste, followed by application of a 2 % sodium fluoride gel every six months.⁽¹¹⁾

One year after the first visit, a follow-up panoramic radiograph was taken (Fig. 4), showing early mixed dentition.



Fig. 4. Panoramic follow-up radiograph one year after the first visit.

At that point, all permanent incisors and first molars were erupted and in occlusion, except for the upper right first molar (16), absent due to planned extraction. The upper second primary molars (55, 65) were exfoliated early, and their absence, along with tooth 16, led to arch length discrepancies:

- On the right side, the upper second premolar follicle (15) descended near the surface; however, only one-third of its root had formed, preventing eruption for the time being. The second molar follicle (17) occupied the space of 16, with root formation in an early stage.
- On the left side, the upper left first permanent molar (26) had mesialized significantly, approaching the first primary molar (64), visibly reducing arch length and creating a risk of crowding for the canine (23) and premolars (24, 25).
- In the lower arch, the most notable finding was an increased curve of Spee, likely due to deep bite associated with mouth breathing and supraeruption of tooth 46 caused by lack of antagonism.

No evidence of third molars was found. The case remains under treatment, awaiting orthodontic consultation to determine management for MIRM-related effects.

DISCUSSION

MIH is an odontogenic disorder that causes enamel mineralization defects in the first permanent molars, possibly accompanied by permanent incisor involvement. Understanding the enamel formation process is fundamental to determining MIH etiology. When disruption occurs during the maturation phase of amelogenesis, a qualitative hypomineralization defect is likely, characterized by increased organic content and reduced mechanical resistance compared to healthy enamel, facilitating rapid breakdown.^(9,12,13)

Its complex etiology is associated with systemic factors capable of altering normal amelogenesis. It is important to recall that the human body functions integrally; thus, when first permanent molars erupt, the effects of MIH-causing factors—occurring between birth and three years of age—become evident, as this is the period when amelogenesis is completed.⁽¹⁴⁾

Diagnosis depends on proper clinical examination. As a preventive measure, topical fluoride varnish applications every three to six months are recommended, allowing close monitoring of affected teeth, as reported by Labrador,⁽¹⁵⁾ in a similar case report. In this patient, topical fluoride was applied during initial visits to promote remineralization and reduce sensitivity in the permanent upper incisors.

Timely extraction of compromised molars is necessary to prevent aesthetic and functional complications resulting from delayed extractions. Given the low adhesion potential of MIH-affected teeth to restorative materials and the frequent need for reinterventions, extraction should be considered—especially when irreversible pulpitis develops due to multiple enamel fractures. Before deciding extraction, assessment of the second permanent molar's root development and bone-tooth discrepancy is essential to ensure a balanced occlusion.

CONCLUSIONS

Among enamel structural defects, MIH has become a topic of current interest due to its marked aesthetic and functional implications. Early diagnosis and treatment minimize damage and improve the aesthetic and functional alterations that MIH may cause in pediatric patients.

AUTHOR CONTRIBUTIONS

LBM: Conceptualization, research, project administration, original draft preparation, review, and editing.

ACH: Research, original draft preparation, review, and editing.

MLA: Research, original draft preparation.

JLA: Conceptualization, review, and editing.

All authors approved the final version of the manuscript.

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