Case Report

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"Cheesymolars" Molar Incisor Hypomineralization: Reports of Three Cases

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ABSTRACT

Background: The Molar Incisor hypomineralization teeth are more prone to caries and post-eruptive enamel breakdown; therefore, it is believed that this condition might be responsible for a substantial proportion of childhood caries. It should be diagnosed as early as possible and managed in a conservative way wherever possible. The aim of this article, including three case reports is to briefly discuss the aetiology, diagnosis, and treatment of patients with molar incisor hypomineralization. In all three cases presented, the aetiology was related to systemic factors that occurred in the first year of life, especially respiratory deficiency and episodes of high fever. Treatment decisions were made according to the severity of hypomineralization. The possible differential diagnosis for MIH is discussed.

Keywords: First molar, Hypo mineralization, hypoplasia, post-eruptive enamel breakdown.

INTRODUCTION

Molar incisor hypomineralization(MIH) appears to have been first recognized in the late 1970s by Swedish dentists working within the public dental services (Koch et al., 1987). Weerheijm et al. (2001) defined the condition as:

"Hypomineralization of systemic origin of 1–4 permanent first molars, frequently associated with affected incisors". (1)

Earlier nomenclature included non-fluoride enamel opacities, internal enamel hypoplasia, non-endemic mottling of enamel, idiopathic enamel opacities and cheese molars. (2) Currently, it is estimated that this condition affects one in six children worldwide. (3) The defect is the result of a variety of environmental factors acting systemically, including prenatal, perinatal, and childhood medical conditions that affect the developing enamel, while a genetic predisposition cannot be excluded. (4)

Table 1: Possible causes of molar incisor hypermineralization

Possible causes of molar incisor hypermineralization	
Asthama	Pneumonia
Upper respiratory tract infections	Otitis media
Antibiotics	Dioxins in mother'smilk
Tonsillitis and tonsillectomy	Exanthamatous fevers of childhood

Pathogenesis

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In general, systemic factors that disturb the ameloblast during the secretory phase cause restriction of crystal elongation and result in pathologically thin, or hypoplastic enamel. [5] Disturbance during the transitional and maturation stage of amelogenesis result in pathologically soft (hypomatured or hypomineralised) enamel of normal thickness.[5]

Clinical appearance, symptoms and signs

MIH lesions are fairly large, demarcated opacities, which are whitish-yellow or yellowish-brown in colour.

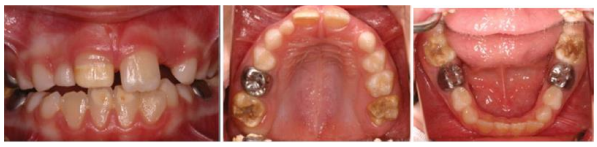

Fig 1: Clinical appearance of molar incisor hypomineralization.

The affected first permanent molars may suffer post-eruptive enamel breakdown, possibly because they undergo occlusal loading. Conversely, incisors affected in MIH rarely exhibit post-eruptive enamel breakdown. [6,7,8]

Classification

In the past, hypomineralized areas have been classified by Alaluusua et al. (1996) as: [9]

Type	Characteristic
Severe	Loss of enamel in association with dentin
Moderate	Loss of enamel
Mild	Colour change, white, yellow, brown.

Clinical Problems

Weerheijm (2003) helpfully pointed out that clinically, in cases of hypoplasia, the margins are mostly smooth, while in MIH, the borders of enamel lost post-eruptively are irregular.[6] First permanent molars affected by MIH may succumb to caries very rapidly, and progression may be hastened by the difficulty some children can have with brushing teeth that may be acutely sensitive. [6,10] Permanent first molars affected by MIH may occasionally be hypersensitive[6,11] and may be difficult to anaesthetize [6]. Indeed, Rodd et al. (2007) investigated the pulps of non carious hypomineralized permanent first molars and found changes present that were indicative of inflammation. [12]

Children with MIH

If an erupting first permanent molar shows signs of opacities and/or post-eruptive breakdown, the child should be monitored frequently until the moment that all four molars have completely erupted. In order to minimize the loss of enamel and any damage due to caries, both preventive and interceptive treatment is required. Besides normal brushing and education to child and parents, prevention also includes fluoride varnish application and application of glass ionomer sealants. Sometimes the sensitivity of the teeth is decreased by these applications. The first aim should be relief of pain followed by consideration of the long-term viability of the molars. If restorative treatment is indicated, proper local anaesthesia is mandatory. The dentist should keep in mind that, in some cases, it can be difficult to get the molar properly anaesthetized. Because of hypersensitive molars, these children have significantly higher management problems.

Case No 1. (Severe form)

A 12 year old girl, whose mother denied of any complication during pregnancy but given history of frequent common cold during 1st year of childhood. Later in life, she developed asthma and used to require nebulization. Clinically she reported with the breakdown of enamel over cuspal tips and incisor surfaces and exposure of dentine, causing severe sensitivity to cold history of root canal treatment in first molars.

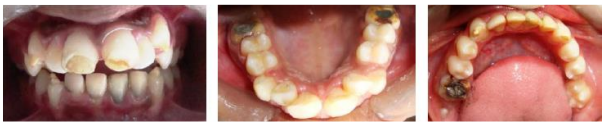

Fig 2(a)-Preoperative image of Hypomineralization of maxillary and mandibular anterior and first permanent molars with loss of enamel, dentin and post obturation restoration with amalgam in the first molar.

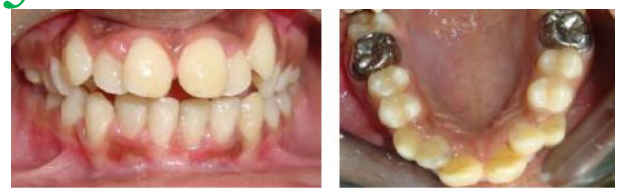

Figure 2 (b)- Postoperative image of the restoration of Hypomineralized molars with stainless crowns and anterior with composite Restoration

Case 2 (Moderate form)

Thirteen years old girl reported with a history of pain in a lower right first molar. On examination, all the first molar are hypoplastic with white spot lesion on the right upper incisor. She gave a history of high fever because of chickenpox in the first year of life. Root canal treatment performed and a metal crown was cemented on the involved tooth. The composite restoration was done for another hypoplastic tooth.

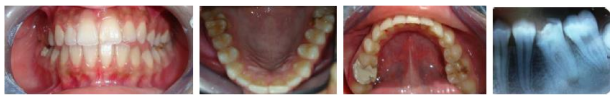

Figure 3(a) – preoperative view of moderate form of molar incisor hypomineralization, progressively caries involving pulp in a lower first molar.

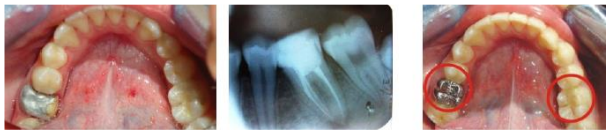

Figure 3(b) – postoperative view of root canal treatment in moderate form of molar incisor hypomineralization

Case 3 (Mild form)

Eleven years old girl whose mother denied any complication during pregnancy but a history of occasional flu with the change in season during the first year of life. She reported with a complaint of decay tooth and food lodgement. On examination, she has a brown spot on left upper central incisor, and right upper first molar was hypoplastic and tended to get carious and breakdown. Proximal caries was present in a lower right first molar. Microabrasion procedure was done for brown spot lesion on a central incisor, and composite restoration was done for the carious and hypoplastic tooth.

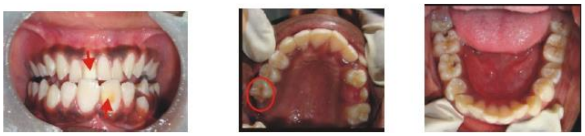

Figure 4(a)- the preoperative image of a mild form of molar incisor hypomineralization involving smooth demarcated pale spot on incisor and brown spot on one of the molar

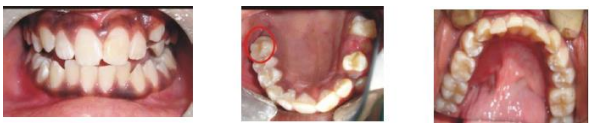

Figure 4(b)- postoperative image after microabraion in involved incisor and composite restoration in molar.

DISCUSSION

The differential diagnosis for MIH can be incipient caries, fluorosis and amelogenesis imperfecta, enamel hypoplasia, and traumatic hypomineralization. The MIH porous enamel can be breakdown easily, under the influence of masticatory forces, leaving behind unprotected dentin and favouring the development of the carious lesion. [13] The incipient carious lesion develops in the cervical region due to plaque accumulation while dental caries developed due to MIH present in cuspal and incisal tips because of occlusal wear in porous enamel area.

MIH can be differentiated from dental fluorosis, which is characterized by diffuse opacities that affect the teeth symmetrically. [16] Although MIH is an asymmetric defect, when a severe injury exists in a tooth, it is common for the contra lateral tooth to also be affected. [6]

The differential diagnosis with amelogenesis imperfecta is based on distribution of the opacities, while the MIH molars are rarely affected in the same intensity; amelogenesis is affected in the whole dentition and there is genetic involvement. [17]

Enamel Hypoplasia is a quantitative defect with reduced enamel thickness. The borders of hypoplastic enamel lesions are mostly regular and smooth, indicating developmental and pre-eruptive lack of enamel. The margins in MIH with post-eruptive enamel breakdown are sharp and irregular

due to post-eruptive shearing of weakened enamel.[16]

Traumatic hypomineralization is associated with a history of dental trauma to the primary predecessor tooth. Periapical infection of the primary tooth can disturb mineralization of the underlying tooth germ. It has a wide variety of clinical presentations differing in shape, outline, localization and colour. It is often limited to one tooth and asymmetrical.[17]

MIH diagnosis in the patients here described was made based on the verification of clinical characteristics already described in the literature, such as opaque yellow-brown discolouration, combined with medical history information reported by the parents.

Different treatment approaches are indicated for MIH depending on the severity of hypomineralization. When esthetic complaints are present (as in case no. 1), restoration with composite resin should be considered as the first treatment option for permanents incisors. More severe cases require more invasive treatments. Semi-permanent restorations using stainless steel crowns or adhesive-retained metal castings are options to be considered (case no.1 and case 2). Microabrasion procedure can also be considered for esthetic reason in mild cases of MIH (case no.3). [18] Problem encountered in these cases is to define cavity margins because of porous enamel and hypersensitivity and difficulty in achieving anaesthesia.

CONCLUSION

Children with poor general health in early childhood or with hypomineralised second primary molars should be considered at risk of MIH. Therefore, they should be monitored more frequently during the eruption of the first permanent molars.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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