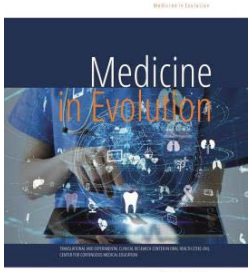
# An orthodontic approach in the management of Molar-Incisor Hypomineralisation (MIH)




**Mărginean Khattab M.A.[1], Motoc G.V.[1], Vaida L.[2], Olariu I.[3], Motoc O.[2], Milutinovici R.A.[4], Dinu S.[1], Popa M.[1]**

*[1]Department of Pediatric Dentistry, Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy, Timişoara, Romania*
*[2]Department of Dental Medicine, Faculty of Medicine and Pharmacy, University from Oradea, Romania*
*[3]Department of Dentistry, Faculty of Medicine, Vasile Goldiş Western University of Arad, Romania*
*[4]Department of Orthodontics, Faculty of Dental Medicine, Victor Babes University of Medicine and Pharmacy Timisoara, Romania*

*Correspondence to:*
*Name: Iustin Olariu*
*Address: Department of Dentistry, Faculty of Medicine and Pharmacy, Vasile Goldiş Western University of Arad, Romania, Liviu Rebreanu Street, no.86, Arad, Arad County, Romania*
*Phone: +40 723423263*
*E-mail address: iustin_olariur@yahoo.com*

## Abstract

Molar Incisor hypomineralisation is a frequent disorder of the enamel of permanent first molars and incisors during childhood. The management of compromised first molars in children represents a clinical challange to the dental team. Management is a multidisciplinary approach and sometimes orthodontist involvement is needed. Extraction of the first molar is a difficult decision for the dental team and also for the parents during early ages. Clinicians should be aware of orthodontic results of extractions when they decide to perform them during the treatment. An extractive strategy with orthodontic considerations is a valid therapeutic option with a good cost-effectiveness ratio in the management of MIH.

**Keywords:** Orthodontics, Paediatric dentistry, MIH

## INTRODUCTION

**Objectives:**

The aim of this review is to highlight the importance of the diagnosis as well as the treatment plan. The following review will present the clinical consideration alongside an orthodontic approach in managing MIH. It is crucial for clinicians including pedodontists to understand the significance of an orthodontic examination around the age of 8 years old so they can establish together the best treatment option.

The term molar incisor hypomineralisation (MIH) was first introduced in 2001 by Weerheijm, and defined as a developmental defects of systemic origin of the enamel of one or more first permanent molar (FPM) with/without the affection of incisors [1]. Recently, new patterns have been observed, such as the cusp tips of permanent canines and premolars and hypomineralised second primary molars [2].

Clinically, hypomineralisation can be seen as an opacitie in the translucency of the enamel. The opacities can be of different colours, depends on the severity of the MIH and they may undergo post-eruptive enamel breakdown due to soft and porous enamel. Several classifications criteria were developed to classify molar-incisor hypomineralisation. The European Academy of Paediatric dentistry first classified MIH in 2003, as the demarcation of the opacity, enamel disintegration, atypical restorations, sensitivity, extracted and unerupted teeth. The next classification includes three categories: mild, moderate and severe [3].

- Mild MIH: Demarcated opacities located at non-stress bearing areas, no caries associated with the affected enamel, no hypersensitivity and incisor involvement is mild if present.
- Moderate MIH: Demarcated opacities present on molars and incisors, the post-eruptive enamel breakdown limited to one or two surfaces without cuspal involvement, atypical restorations can be needed and normal dental sensitivity.
- Severe MIH: Post-eruptive enamel breakdown, crown damage, caries accompanying affected enamel, a history of dental sensitivity and aesthetic problems;

**Review:**

The MIH management can raise some orthodontic questions. In children with moderated and severe affected first permanent molars, the clinical consideration is to decide whether to restore or extract.

Researches have demonstrated that children presenting with moderate or severe MIH, most often require life-long, extensive and repeated restorative treatments that will may eventually fail. Studies have demonstraded that children with MIH show a greater chance of having their teeth restored compared to unaffected children.

Extraction of affected first molars may be preferable to attempting complicated restorative management in young age [4].

The decision shoud be taken in accordance with some important aspects such as: age, degree of severity, pulp involvement, restorability of the tooth/teeth, expected long term treatment, orthodontic considerations (amount and site of crowding, maloclusion), presence of additional dental anomalies, presence or absence of other teeth, presence of third molar germs, oral hygiene, patient and parent motivation to orthodontic treatment.

Situations in which the literature recommends extraction as a possible option are: severe hypomineralisation, severe sensitivity or pain, lage multi-surface lesions or restorations, difficult restorations or with history of restorative failure, difficult behaviour, apical pathology, orthodontic space requirements where first molars are damaged and premolars are healthy, posterior crowding and the third molar in a good position [5].

To avoid a long and complicated treatment, it is recommended that extractions are done in the precise timing. It is important to have a clinical examination and to take a panoramic radiograph that will corroborate the ideal dental age of 8-9 years [6].

**Management of upper first permanent molars extractions**

The extraction done between the age of 8-10 years old with unerupted second permanent molar has a satisfactory potential of closing the space by bodily moving and a low level of tipping if there is an anterior crowding, if there is insufficient crowding, the space will remain.

The extraction done after the eruption of the second permanent molar will led to tipping and rotation of the molar. The extraction of the FPM has a limited effect of reducing the crowding in the anterior segment. In these cases, fixed appliance will be recommended. In cases where we have an anterior crowding it is recommended the extraction of the homonym molar to avoid the midline deviation. An alternative could be the extraction of a tooth other than the molar on the contralateral side [6].

The extraction of the permanent first molar will accelerate and help the eruption of the third molar.

It is important to note that Class I cases have a better success rate then Class II cases that are more critical to plan, particularly with regard to the timing of upper FPMs extraction, due to the space needed in order to correct the overjet and the incisors relation.

**Management of lower first permanent molar extraction**

The best time for extracting the first permanent molar in the lower arch is at the dental age of 8-9 years when the crown of the unerupted second permanent molar is completed and the bifurcation of the roots started. In these cases, there is a satisfactory potential of closing the space by a bodily movement and low level of tipping resulting in a good contact point between the second permanent molar and the second molar, if there is crowding. If there is reduced/ no crowding, a fix appliance will be required to close the remaining space [7].

If the extraction of the first permanent molar is done before the ideal age, it is a risk of the second premolar distally drifting. The second premolar could erupt in to the first permanent molar socket or it could be impacted against the crown of the second permanent molar, remaining a space between the two premolars. To avoid this, it is recommended to extract the second primary molar in the same time as the first permanent molar, allowing the eruption of the second premolar [8-10].

The extraction of the first permanent molar after the age 12 years old when the second permanent molar has erupted, leads to a slow and reduced mesialization of the second permanent molar, especially if there is no pressure from the third molar and the tongue position in between, which is acting like a space maintainer. The second permanent molar will tip mesial and rotate lingually.

If the remaining space and the tipping are left untreated may lead to periodontal problems [9-11].

In cases with crowding, it is recommended to extract the contralateral first permanent molar or premolar to avoid the midline shifting. Vertically an overeruption of the upper first permanent molar can take place, if the upper molar is not in occlusion with lower mesial tooth of the extraction site. If the overeruption occurs it will impede the second molar to move forward and will complicate the orthodontic treatment [6].

## CONCLUSIONS

The treatment plan and the timing of the extraction is essential if we want to have a good result, especially when a malocclusion is present.

The importance of a multidisciplinary team that includes an orthodontist, represents a valid treatment approach that is not only cost effective, but aslo limits the repeated restorative events whom child is normally subjected to, which can lead to increase anxiety in those children.

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