Clinical Management Approach of Molar Incisor Hypomineralisation. A Case report.

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Abstract

Molar incisor hypomineralisation (MIH) is a relatively common dental defect that appears in first permanent molars and incisors and varies in clinical severity. The specific etiological factors remain unclear. Inappropriate management of the condition can result in misdiagnosis and/or unnecessary dental treatment. Clinical relevance statement

Failure of early diagnosis and dental management in cases of Molar Incisor Hypomineralisation (MIH) leads to rapid development of dental caries, increased pulpal inflammation and continuous enamel as well as restoration breakdown.

Objective statement

The reader should understand the Molar Incisor Hypomineralisation (MIH) condition and the availability of different management options of this condition.

Introduction

Molar Incisor Hypomineralisation (MIH) is a developmentally derived dental defect that involves hypomineralisation of 1 to 4 first permanent molars (FPM), frequently associated with similarly affected permanent incisors. The pattern of enamel defects consists of asymmetric, well-demarcated defects affecting the enamel of the FPMs and is associated with similar defects in permanent incisors and canines tips. (1)

~ Prevalence
Available modern clinical prevalence data for MIH, mostly from Northern Europe, ranges from 3.6% to 25% and seems to differ between countries and birth cohorts. (2)

~ An etiology
An etiology of this condition is poorly understood, with many associated factors (including environmental changes, diet, feeding, respiratory diseases, oxygen shortage of ameloblasts and high fever diseases) but few proven causative agents. (3)

~ Clinical Features
Fairly large demarcated opacities, whitish-yellow or yellowish-brown in colour that may or may not be associated with post-eruptive enamel breakdown. Hypomineralised enamel can be soft, porous and look like discoloured chalk or Old Dutch cheese. Subsurface porosity leads to breakdown after eruption, especially under occlusal forces, resulting in exposed dentine and sensitivity. (4)

~ Management
Permanent molars affected by hypomineralisation are prone to rapid development of dental caries and repeated breakdown of restorations. Therefore, careful planning is required, taking into account patient’s age (behaviour management issues), degree of crowding and co-operation. Sensitivity of affected teeth plays a major role in difficulty of achieving anaesthesia and thus behavioural issues.

- Preventive
  • Diet advice
  • Higher fluoride toothpaste (at least 1450 ppm F)
  • Topical fluoride varnish
  • Casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)

- Restorative:
  • A small lesion can be treated with localized composite, where the enamel is soft, or fissure sealants, where the hardness of the enamel appears no different from the unaffected enamel.
  • GIC is recommended as dentine replacement or as an interim restoration due to ease of placement, fluoride release and chemical bonding.
  • For extensive lesions with post-eruptive breakdown especially if the cusps are involved, preformed stainless steel crowns (SSCs) are preferred as an effective medium-term restoration. SSCs can preserve the FPM until cast restorations are feasible. (5)(6)

- To save the tooth or not?
  • The first decision in the management of the MIH FPM is whether the tooth should be saved or not. The decision to extract or restore will depend upon a number of different factors, some of these being the degree/extent of hypomineralisation, post-eruptive breakdown, sensitivity, age and cooperation of the patient, any

Fig. 1 (a, b, c, & d). Showing a diabased filling of 36. 16 yellowish brown hypomineralised lesions. 36 and 46 large composite fillings.

Fig. 2 (a, b & c). OPT radiograph showing: normal alveolar bone levels, a normally developing dentition, except lower left third molar. E’s are near physiological exfoliation, more than 2/3 of the roots of 7’s are calcified, 46 RCT’d, 36 composite restoration, 16-26 deep caries. PA radiograph showing: no signs of perisulcular radiolucency in lower and upper left first molars.


Treatment

The treatment plan was set in two phases including Short/ Medium term and long-term. The short term will start with Emergency phase for restoring the 26 with GI as a temporary filling. An extensive preventive program was implemented in addition to diet assessment, analysis, and advice and fluoride application. In several visits crown preparation was done under local anesthesia for 36, 16, and 26 followed by stainless steel crown placement. Patient’s occlusion was checked for any discrepancy in each visit.

As S.S is considered to be of high caries risk status She was kept on regular recall programme including revisit visits and fluoride varnish application every 5 months, radiographs every 6 months. See Figures 5 (a, b, c, d & e).

Long Term Treatment Plan and Future Considerations

- Regular long-term diet monitoring and reinforcement of oral hygiene practices.
- Periodic review of the restorations with radiographic assessment.
- Review the first permanent molars status.
- Monitor eruption and development of dentition.
- Educate patient and parents about the poor long-term prognosis of first permanent molars these teeth and available future treatment options.

Discussion

Children with MIH have higher treatment needs and significant challenges in behavior management than other children. S.S was a quiet girl who was apprehensive in the beginning of the dental visit but willing to have the treatment. S.S was diagnosed as MIH in the permanent first molars. Using non-pharmacological behavior management techniques including calm behavior, the relaxation and distraction helped to accustomize S.S to dental treatment. These techniques are widely used in children’s dentistry and well accepted by parents. The technique works well combined with behaviour shaping. S.S was rewarded with a gift after each appointment as positive reinforcement for her good behaviour and cooperation. 26 was temporized with glass ionomer to relieve discomfort, stabilize the situation and to reduce bacterial count present in the oral cavity.

Failure of achieving complete anaesthesia of first permanent molars was related to the nature of MIH. S.S received supplemental intraligamental infiltration. The innervations density in the pulp of hypomineralised molars is significantly greater than of normal molars. This can explain why lower left 6 was hard to be anaesthetised. Due to poor quality of the FPM teeth of S.S and significant tooth break down full coverage by preformed metal crowns was done. Preformed metal crowns prevent further tooth loss, control sensitivity, establish correct interproximal and proper occlusal contacts, are not costly and require little time to prepare and insert.

Conclusions

- The presence of MIH molars not only requires the dentist to identify problems at the earliest stage in these teeth and available future treatment options.
- It is advisable to consider children with a poor general health in the first four years after birth at risk for MIH. These children should be monitored more frequently during eruption of the first permanent molars.
- Whilst many potential approaches exist for the restorative management of molar incisor hypomineralisation, few are supported by best quality clinical research data. Preformed Metal crowns have been recommended as the prosthesis of choice in MIH affected posterior teeth with post-eruptive enamel breakdown in majority of the literature available.
- The use of nitrous oxide inhalation sedation can be a useful adjunct in obtaining satisfactory anaesthesia in MIH patients. Nitrous oxide was not used in the case of S.S due to parental refusal because of limited financial resources.

- Had this patient presented earlier, consideration for enforced extraction of FPM would have been considered.

References


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