Complications of untreated molar-incisor hypomineralization in a 12-year-old boy

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Abstract

Complications arising because of untreated molar-incisor hypomineralization (MIH) have received little mention in the dental literature. However, this can be an area of concern, with severe consequences in rare cases. Hence, early recognition and prompt management of MIH is essential for long-term oral health of affected individuals. This paper describes an untreated case of severe MIH that resulted in infection of facial spaces.

Introduction

Molar-incisor hypomineralization (MIH) is a clinical condition of systemic origin characterized by qualitative enamel defects of the first permanent molars and frequently associated with affected incisors. For a patient to be diagnosed as suffering from MIH, at least one permanent first molar must be affected with or without involvement of the incisors. The term molar hypomineralization has been used, sometimes, to distinguish children in whom the incisors are not affected. Due to the developmental history of the permanent first molars and upper and lower anterior teeth, the search for an etiology has focused around the time of birth and early childhood. Several researchers have discussed possible causes, prenatal (maternal infections, metabolic disturbances, etc.), natal (complicated delivery) and postnatal (neonatal viral infections, prolonged antibiotic and other medication usage). However, there is currently insufficient evidence to establish etiological factor(s) relevant to MIH and it has been suggested that MIH is caused by not one but many different factors which may act together, increasing the risk.

The defect is clinically presented as demarcated enamel opacities of different color in the affected teeth, occasionally undergoing post-eruptive breakdown due to soft and porous enamel. This may result in atypical cavities or even complete coronal distortion, requiring extensive restorative treatment. Post-eruptive breakdown of the defective enamel creates areas more conducive to plaque retention which, combined with improper oral hygiene maintenance by the patient because of profound hypersensitivity of the affected teeth, might collectively result in increased caries susceptibility. The importance of recognizing and managing MIH cannot be overemphasized. Early identification of the condition and its prompt management is crucial for successful, long-term outcomes in affected children. Failure to address MIH and its related problems such as dental caries can lead to further and severe destruction of tooth structure and ultimately, result in loss of the affected teeth or in rare cases, give rise to a life-threatening situation due to severe infection. This paper presents an untreated case of severe MIH that led to pulpal involvement of one of the affected teeth and consequently, to submandibular and submental space infection.

Case Report

A 12-year-old boy reported to our paediatric dental service with the complaint of pain and swelling in the lower face and jaw since five days, associated with fever and inability to open the mouth or swallow food. The pain was severe and throbbing. The pain and swelling originated in the region of the right lower back tooth and eventually spread to the left side of the mandible. The boy had never sought dental advice until the present time. He had, a few days earlier, consulted a local dental practitioner for the same problem but was only prescribed medication for pain. The boy appeared pale, lethargic, irritable and highly apprehensive. Examination revealed a diffuse swelling which involved the region of the right lower back tooth and apical radiolucency in relation to the mesial root of the right mandibular first permanent molar. Orthopantomograph revealed radiolucencies closely approximating the pulps in both mandibular first permanent molars, periapical radiolucency in relation to the mesial root and widened periodontal space around the distal root of the right mandibular first permanent molar (Figure 4). A diagnosis of space infection involving the submandibular and submental spaces bilaterally was made from the clinical and radiographic findings.

Since the child was highly anxious, he was first counseled along with his parents. Thereafter, the child was offered reassurance and positive reinforcement throughout the treatment period. The dentoalveolar abscess is poly-microbial comprising various facultative anaerobes and strict anaerobes and a vast majority of dental abscesses respond to surgical treatment, such as drainage of pus and elimination of the source of infection, with antibiotic use limited to severe spreading infections. Therefore, following routine blood investigations the patient was put on intravenous analgesics, fluids and empiric antibiotic therapy with amoxicillin and metronidazole. Extraoral incision and drainage was instituted 2 hours after initiating antibiotic therapy. After 24 h the patient’s mouth opening was found to have increased sufficiently to allow emergency...
access opening of the right first permanent molar. By the second day, the swelling was reduced and mouth opening was improved considerably permitting complete cleaning of the root canals. The boy was discharged after three days with instructions to continue oral antibiotics for four days more totaling a course of seven days. At his next appointment four days later, the boy appeared fine, the swelling having diminished completely and the mouth opening to normal limits. Thereafter, routine root canal therapy was carried out on the right molar. Excavation of caries in the left first permanent molar revealed no pulpal involvement; hence, indirect pulp capping was done. Stainless steel crowns were placed on both mandibular first permanent molars (Figure 5) and sealants on maxillary first permanent molars. The incisor hypomineralization was very mild and since it did not present a major esthetic problem, it was decided that no treatment was required for the same. The boy was advised good oral hygiene and regular checkup.

**Discussion**

The decline of dental caries worldwide has encouraged researchers and clinicians to observe and recognize other problems that were overlooked in the past. The last couple of decades has seen the recognition and acknowledgement of non-fluoride-associated developmental dental defects as an increasing clinical problem. These defects, characterized by discolored opacities or as a total absence of enamel, are observed to most commonly affect the first permanent molars with or without involvement of the permanent incisors. During the last decade the term molar-incisor hypomineralization has been used to describe such defects.

The presence of enamel defects can considerably affect a child’s overall well-being. Defective molars may be profoundly sensitive to routine oral hygiene procedures as well as more susceptible to plaque accumulation and dental caries. Research has found that, by nine years of age, MIH-affected children have undergone dental treatment on their permanent first molars nearly ten times as often as healthy children. This greater incidence of dental caries combined with compromised, defective enamel results in substantial dental morbidity and presents challenges to the clinician. Not surprisingly, behavior management problems and dental fear and anxiety are common in affected than unaffected individuals.

Serious complications seldom arise out of MIH if the condition is detected and managed early. However, severe, untreated cases are more often than not associated with dental caries. Destruction of the coronal tooth structure may result in tipping of the adjacent teeth or supraeruption of the opposing tooth, necessitating orthodontic intervention. On rare occasions, severe infection involving a MIH-affected tooth may present a life-threatening situation.

Prevalence rates of MIH reportedly to range from 2.4-40.2% worldwide. Considering the high prevalence, it becomes imperative that the condition be identified early and appropriate treatment instituted as soon as possible. By this, not only is the further destruction of the tooth structure prevented, the occurrence of complications such as the one seen in the present case becomes virtually impossible. The available treatment modalities for teeth with MIH are extensive, ranging from prevention to restoration to extraction. The decision on which treatment should be based is complex and dependent on a number of factors such as the severity of the condition, dental age of the child, presence of carious lesions,
occlusion, aesthetics, orthodontic condition and patient/parent compliance.\textsuperscript{7} Knowledge of the clinical appearance of MIH and its diagnosis as soon as the first permanent molars erupt play an important role in planning treatment, maintenance and prognosis. Early diagnosis will limit treatment to a conservative approach. Because of the different degrees of involvement in a single patient’s mouth, assessment of each of the affected teeth is necessary for providing effective treatment. It is also important to raise public awareness regarding dental enamel malformations that can increase the caries risk of the individual.

References