

Holistic Approach for the Management of a 7 Year Old Child with Mandibular Fracture and Hypomineralized First Molars - A Case Report

Sanjeev Kumar Singh¹, Manojkumar Jaiswal^{2*}, Ashima Goyal³ and Aditi Kapur⁴

¹Senior Resident, OHSC PGIMER, Chandigarh, India

²Assistant Professor, PGIMER, Chandigarh, India

³Professor, PGIMER, Chandigarh, India

⁴Additional Professor, PGIMER, Chandigarh, India

***Corresponding Author:** Manojkumar Jaiswal, Assistant Professor, PGIMER, Chandigarh, India.

Received: December 28, 2020; **Published:** May 31, 2021

Abstract

Mandibular fractures contribute to a significant portion of maxillofacial injuries. In comparison to adult fractures, pediatric fractures are approached differently due to the stage of mixed dentition, the elasticity of the craniofacial skeleton, and the potential for remodeling of the bone and fracture site with growth. Treatment principles of mandibular fractures differ from that of adults due to concerns regarding mandibular growth and development of the dentition. A case of a 7-year-old boy with fractured mandible managed by closed reduction using an open occlusal acrylic splint and circum mandibular wiring is presented as well as restoration of first permanent molars with molar incisor hypomineralization with direct composite onlays.

Keywords: Holistic Approach; Mandibular Fracture; Hypomineralized First Molars

Introduction

Holistic approach to patient management is the very essence of Pediatric Dentistry, in which care is rendered not only based on the presenting symptoms, but the entire stomatognathic system as relating to general health of the patient as a whole. This ensures proper patient management and motivation to reinforce hygiene measures. Often various symptoms of even severe dental conditions are missed or ignored by the patient or unreported by their parents, owing to lack of knowledge or accessibility, resulting in further damage. Molar Incisor Hypomineralization is be one such condition which might present only as sensitivity, which might often be ignored by parents especially in far flung areas with lack of easy accessibility to dental care.

Case Report

A 7 year old child reported to the unit of Pedodontics and Preventive Dentistry, Oral Health Sciences Centre, PGIMER, Chandigarh, with a history of trauma 1 day back when she was hit by a while playing in front of her house, thereby sustaining injuries to her face. The patient was conscious, well oriented to time, place and person. There was no history of convulsions, vomiting, or bleeding from nose or ear. No ecchymosis on face could be seen. Extraoral examination revealed a left sided lower facial swelling bigonial flaring. On palpation, step deformity could be detected in respect to inferior border of mandible and in body region. Mouth opening was measured to be 15mm, with limited left lateral and excursive movements. Radiographic examination revealed fracture in left parasymphysis region (between 73 and 74) and right body region (between 84 and 85) (Figure 1a). Closed reduction was planned and fracture reduction was done with cap splint and stabilized with circum mandibular wiring under general anesthesia, following convention steps for cap splint fabrication and placement (Figure 1b). The patient was recalled at regular intervals and cap splint removal was done after a month. It was noted that all four of her permanent molars were affected by Molar Incisor Hypomineralization. Patient had compromised oral hygiene even on multiple

follow up appointments, even after cap splint removal and reinforcement of oral hygiene instructions, reason being extreme sensitivity in the molar region causing lack of proper toothbrushing. Hence, post cap splint removal (Figure 1c), composite onlays were planned and delivered to the patient for all four permanent first permanent molars (Figure 2a and 2b). Oral hygiene of our patient dramatically improved and was found to sustain for further follow ups upto one year (Figure 1d).



Figure 1: a) Pretreatment with left parasymphysis region (between 73 and 74) and right body region (between 84 and 85). b) fracture reduction and stabilized with cap splint and circum mandibular wiring. c) After cap splint removal and stabilized occlusion d) occlusion and oral hygiene at 12 months follow up.

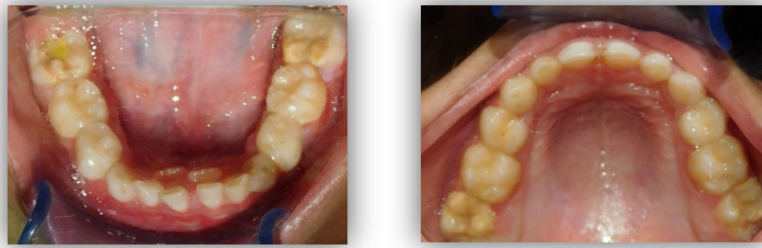


Figure 2a and 2b: Severely form of MIH in 36 and 46 with post eruptive breakdown (PEB) 16 and 26 having brown opacities with PEB.



Figure 3a and 3b: Composite onlays in all the four first permanent molars.

Discussion

Mandibular fractures are very rare in children; however, still, mandibular fracture is the most common form of facial injury occurring in pediatric age group [1]. The management of mandibular fractures in children differs somewhat from that of adults mainly because of the concern for possible disruption of growth. In children, the final result is determined not merely by initial treatment but by the effect that growth has on form and function [2]. The shape and shortness of deciduous crowns may make the placement of circumdental wires and arch bar slightly more difficult in children. While doing open reduction and fixation, the presence of tooth buds throughout the body of mandible must be a consideration as trauma to developing tooth buds may result in failure of eruption of permanent teeth and hence narrow alveolar ridge [3]. Several studies have recommended the use of prefabricated acrylic splints as a treatment for pediatric mandibular fractures. These splints are more reliable than open reduction or intermaxillary fixation (IMF) techniques with regard to cost-effectiveness, ease of application and removal, reduced operating time, maximum stability during healing period, minimal trauma for adjacent anatomical structures, and comfort for young patients [4].

Predictable and successful rehabilitation of first permanent molars affected with MIH often poses a significant challenge for pediatric dentists, culminating in serious clinical management problems. The potential problems associated with restoration of MIH affected teeth are sensitivity and rapid caries development, repeated marginal breakdown, a limited cooperation of a young child in rendering a treatment, difficulty in achieving anaesthesia due to the presence of subclinical pulpal inflammation and the associated difficulty in isolating a partially erupted permanent molar [5]. The principle objective of treating MIH affected molars is not only to provide immediate relief from pain and sensitivity but also to provide a long lasting preferably aesthetic and a durable restoration to maintain the tooth in the functional state for as long as possible.

Direct resin restorations are an acceptable treatment modality for first permanent molars affected with the milder form of MIH and have shown clinically acceptable performance [6,7]. Composite resin materials have shown long-term stability and higher success rate (85.3%) as compared to other restorative materials such as compomer (success rate 64.3%) and GIC (49.2%) when used for restoring MIH affected molars [6,7]. However, placement of the final restoration margins and an entire removal of the hypomineralized enamel beyond the extent of the cavity is still debatable and requires further investigations [8]. This is because the interface of enamel-adhesive of defective enamel is porous with cracks, has decreased bond strength, and a higher likelihood of adhesive failure compared to sound enamel.

For 'moderate' cases of MIH, where the enamel and dentine defect is associated with well demarcated and confined to one or two surfaces, placement of composite restoration/onlays have been recommended and have shown a clinical success in terms of retention and elimination of sensitivity [9,10]. However the associated problems of repeated marginal breakdown, frequent loss of restoration due to inadequate adhesion and disruption of the cavosurface margin of the atypical restorations, leading to secondary caries, often lead to frequent replacement of such restorations [11]. It has been reported that MIH affected molars undergo dental treatment nearly 9 times more often than non MIH molars, and every defective tooth on an average is treated twice [11]. In molars affected with severe MIH with or without post eruptive breakdown this problem is further compounded as these defects often require extensive fillings or restorations, inevitably increasing the risk of failure-both of the tooth and the restoration. Furthermore, for pulpally involved MIH affected molars, owing to the amount of associated tooth destruction, the prognosis itself may become questionable/poor. Limited treatment options are available for molars affected with severe form of MIH. American Association of Pediatric Dentistry in 2008 also recommended the placement of full coverage crowns to prevent the further breakdown of hypomineralized molars under the influence of masticatory load [10,12].

Conclusion

Hypomineralised enamel defects (MIH) are one of the common clinical problems which brings painful consequences, poor aesthetics and a negative impact on the quality of life. In cases where mandibular fracture is associated with hypomineralized first permanent mo-

lars will further enhance the destruction of coronal portion and also due to increased sensitivity these children are prone for high caries risk due to poor oral hygiene. Good understanding about the etiology, early diagnosis by differentiating from other enamel defects and appropriate treatment are essential for the management of MIH.

Bibliography

1. Sardana D., *et al.* "Comprehensive management of pediatric mandibular fracture caused by an unusual etiology". *African Journal of Trauma* 3 (2014): 39-42.
2. Sharma S., *et al.* "Paediatric mandibular fractures: A review". *International Journal of Clinical Pediatric Dentistry* 2 (2009):1-5.
3. Yadav S., *et al.* "Circummandibular wiring: An absolute answer to paediatric maxillofacial trauma: An unusual case report". *SRM Journal of Research in Dental Sciences* 3 (2012): 268-270.
4. Kocabay C., *et al.* "The conservative treatment of pediatric mandibular fracture with prefabricated surgical splint: A case report". *Dental Traumatology* 23 (2007): 247-250.
5. Camila Maria Bullio., *et al.* "Survival of sealants in molars affected by molar incisor hypomineralization: 18-month follow-up". *Brazilian Oral Research – BOR* 31 (2017): e30.
6. Weerheijm KL. "Molar incisor hypomineralisation (MIH)". *European Journal of Paediatric Dentistry* 4 (2003): 114-120.
7. Alaluusua S., *et al.* "Polychlorinated dibenzo-p-dioxins and dibenzofurans via mother's milk may cause developmental defects in the child's teeth". *Environmental Toxicology and Pharmacology* 1 (1996): 193-197.
8. Zagdwon AM., *et al.* "A prospective clinical trial comparing preformed metal crowns and cast restorations for defective first permanent molars". *European Archives of Paediatric Dentistry - EAPD* 4 (2003): 138-142.
9. Gaardmand E., *et al.* "Minimally invasive cast adhesive copings for early restoration of hypomineralised first permanent molars with post-eruptive breakdown". *European Archives of Paediatric Dentistry - EAPD* 14 (2013): 35-39.
10. Koch MJ and Garcia-Godoy F. "The clinical performance of laboratory fabricated crowns placed on first permanent molars with developmental defects". *Journal of the American Dental Association* 131 (2000): 1285-1290.
11. Kotsanos N., *et al.* "Treatment management of first permanent molars in children with Molar-Incisor Hypomineralisation". *European Journal of Paediatric Dentistry* 6.4 (2005): 179-184.
12. William V., *et al.* "Molar Incisor Hypomineralization: Review and Recommendations for Clinical Management". *The Pediatric Dental Journal* 28 (2006): 224-232.

Volume 20 Issue 6 June 2021

©All rights reserved by Manojkumar Jaiswal., et al.