MAVEN eISSN: 25814443 | www.idahow.org

CASE REPORT

Molar Incisor Hypomineralisation and its Management- A Case Report

Dhritiman Barman[1], Pampa Adhya[2]

[1]Post Graduate Trainee, Department of Orthodontics and Dentofacial Orthopaedics, Haldia Institute of Dental Sciences and Research, [2]Associate Professor, Department of Conserva- tive Dentistry and Endodontics, Dr. R. Ahmed Dental College and Hospital, Kolkata.

Corresponding Author: Dr. Dhritiman Barman, Post Graduate Trainee, Department of Or- thodontics and Dentofacial Orthopaedics, Haldia Institute of Dental Sciences and Research, West Bengal. Email id: dgritimanbarman93@gmail.com.

Abstract

Esthetics is an important factor in a patient's decision to undergo endodontic treatment. Intrinsic discolorations are due to the presence of chromogenic material within enamel or dentin, incorporated either during odontogenesis or after tooth eruption. Intrinsic colors are determined by optical properties of enamel and dentin and their interaction with light. If incorporated into the dentin, they become visible because of the translucency of the enamel. The following case report is on intrinsic stain and its management. (2020, Vol. 04; Issue 01: Page 61 – 64)

Keywords: Intrinsic discoloration, Chromogenic material, Hypomineralisation.

Introduction

Molar incisor hypomineralisation (MIH) is a type of enamel defect affecting the mo- lars and incisors in the permanent denti- tion. It is considered a world wide problem and usually occurs in children under 10 years old. This condition is caused by the lack of mineralization of enamel during its maturation phase, due to interruption to the function of ameloblasts (1). Many fac- tors have been suggested, such as genet- ics and medical problems during preg- nancy, but only childhood illness, fever in particular seems to be associated with MIH (2, 3). The enamel of the affected teeth appears yellow, brown, cream or white and appears aesthetically displeasing (1). As the enamel is not fully mineralized, children with MIH are more likely to expe- rience tooth decay compared to those without the condition (4).

Case Report

22 years old female patient from Haring- hata, Nadia came in the Dept. of Con- servative Dentistry and Endodontics with a chief complain of pain in the anterior re- gion of upper jaw and scattered discolora- tion in the anterior portion of both the up- per jaw and lower jaw. She had a previous history of pain in the same region 1 year back which was subsided after taking medicines. On examination both the max- illary central and lateral incisors were found tender on percussion. On radio- graphic examination, periapical lesion was found apical to the both the central inci- sors (11 and 21) (Fig 1A). Elli's class II fracture was also noticed on the maxillary left lateral incisor. Vitality test confirmed that both the maxillary lateral incisors (12 and 22) were non-vital. The main concern was to relief the patient from pain and to mask brownish the discoloration. So, a treatment plan was made. RCT will be

done to alleviate pain followed by fabrica- tion of metal ceramic crown for the maxil- lary anteriors (11, 12, 13, 21, 22, 23). In case of mandibular anterior teeth, mask- ing the discoloration with light cure com- posite resin was planned. On examination a score 2 calculus was found in the labial and lingual side of anterior teeth of lower jaw. Ultrasonic Scaling was performed and she was taught the brushing techniques. Access cavities were prepared and bio-me- chanical preparations were done for 11, 21, 12 and 22. The apical portion of 11 was found slightly resorbed and it was filled with calcium hydroxide and the pa- tient was asked to come for follow up after
2 weeks. There was improvement in the apical region and the open apex of 11 was found constricted (Fig 1B). After 4 weeks, root canals of all four teeth were obturated with gutta percha in lateral condensation method (Fig 1C).

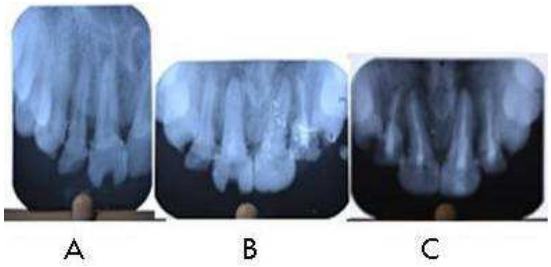

Figure 1: Pre, mid and post treatment ra- diograph

After completion of endodontic part, here comes the prosthodontic part. Firstly, di- agnostic casts were fabricated. Primary impression was taken with irreversible hy- drocolloid (alginate, Algitex) in a stock tray and cast was prepared with dental stone. It revealed that crown height was insuffi- cient in 12, 21 and 22 regions. Jaw rela- tion records were made and the casts were mounted on a semi-adjustable articulator. A diagnostic wax up for full veneer crowns in 13, 12, 11, 21, 22, 23 were done. The wax up was then shown to the patient and with her consent, crown lengthening was planned in 12, 21, 22 regions. A surgical splint was fabricated keeping the edge of the splint to the desired gingival level.

Crown lengthening procedure was per- formed with apically positioned flap and necessary osteoplasty procedure was car- ried out to maintain biological width. Per- iodontal pack was given.

Figure 2: Crown lengthening procedure

After 3 weeks, healing was completed and satisfactory result was obtained. Thereaf- ter, tooth preparation for full veneer metal ceramic crown was done in 13, 12, 11, 21, 22, 23. Finish lines were kept on cemen- tum. Temporary crowns were fabricated using clear acrylic and cemented with zinc polycarboxylate cement. After few days permanent metal ceramic crown had been cemented and composite restoration was done on mandibular anterior teeth (Fig 3).

Figure 3: Pre and post treatment in- traoral view

Discussion

The discoloration which was present in both the central and lateral incisors of maxillary arch (11, 12, 21, 22) were ex- tended till the cervical 3rd from the middle third of the respective tooth and in the ca- nines of both the arches (13, 23, 33, 43) the discoloration was present only in the upper 3rd region of the respective tooth. No deciduous teeth were affected and also no such discolorations were present with the people residing in that area. The patient gave no such history of similar discolora- tions present with the relatives of the pa- tient. Since the stains are localized and present much deeper in the tooth, they are

intrinsic stains. Molar Incisor Hypomineralisation (MIH), which is a type of Amelo- genesis imperfect, is given as provisional diagnosis in this case. MIH affects perma- nent dentition only. Following diseases can be given as differ- ential diagnosis for this case (5, 6):

1. Genetic defects and hereditary dis- eases (Stains are usually general- ized in hereditary diseases, but stains are localized in present case)
2. Amelogenesis Imperfecta (It affects both deciduous and permanent dentition. In present case, no his- tory of discolouration in deciduous dentition.)
3. Dentinogenesis Imperfecta (It af- fects both deciduous and perma- nent dentition. No history of discol- ouration in deciduous dentition in present case.)
4. Dentin Dysplasia (IOPA radiograph reveals no enlarged pulps in pre- sent case.)
5. Alkaptonuria
6. Congenital Erythropoetic Porphyria (Red Discoloration should present)
7. Congenital Hyperbilirubinaemia (Green Yellow Discoloration should present)
8. Tetracycline Staining (No history was present in this case.)
9. Flurosis

All these differential diagnosis are ex- cluded by history, clinical examination and radiographic examination. In case of Amelogenesis Imperfecta, Tetracycline staining and Flurosis where the stains are generalized, bleaching procedure or full mouth rehabilitation or ceramic veneers are used to improve esthetics; but in this case, the stains were localized only in the anteriors. Many factors can be contrib- uting to MIH and until now the aetiology of MIH is still unclear. Some studies stated that common childhood illness was one of the contributing factors for MIH (7). Crom- bie et al, 2009 stated that common childhood illness does appear to increase the prevalence of MIH but again further work will be required to clarify the specific causes of this observed effect (8).

As there was a periapical infection apical to the maxillary central incisors, root ca- nal treatment was performed followed by fabrication of metal ceramic crown. Stain- less steel crowns are reported to be the most effective and efficient restoration in managing tooth sensitivity and restoring severely broken down primary molars and permanent molars in children. However, stainless steel crowns do not have per- fectly adapted margins and as such their long-term use on the permanent teeth must be carefully considered (9). In this case esthetics would have been compro- mised. Porcelain fused to metal (PFM) crowns for the anterior and posterior teeth are the restoration of choice for amelogen- esis imperfect (AI) patients and have been reported to be successful but only in af- fected adults (10). Ceramic crowns are also considered for anterior restorations because of its esthetics. As the enamel was slightly brittle and the discoloration in the mandibular anteriors were present from the middle of the crown to the cervi- cal portion, the stains were masked by us- ing light cure composite material with minimal reduction of the crown only on the labial side. Rada reported composite resins provided satisfactory esthetics and durability (11). However, a high failure rate associated with insufficient bonding between the composite resin restoration and enamel among variants of AI has been reported in the past (12). Several ap- proaches have been documented to im- prove bonding strength between compo- site resin restoration and enamel. Venezie et al. found that pretreatment of enamel surfaces affected by AI with five percent sodium hypochlorite resulted in an im- provement of bonding strength in vitro (13). When a more conservative approach is desired, resin modified glass ionomer (RMGI) is recommended in occlusal non- stress bearing areas because of its fluoride releasing and chemically retentive ability, while composites resin provide acceptable

resistance to occlusal wear in stress bear- ing tooth surfaces (10). As discussed ear- lier, Ellis class II fracture was noticed on the maxillary lateral incisors which may suggest a reduction of the vertical dimen- sion of the occlusion. Since there were no attrition marks on the teeth and the pa- tient was young (22 years), full mouth re- habilitation was opted out. Bleaching or fabrication of ceramic veneers in this case was also not done because of the enamel thickness.

Conclusion

It is vivid from the above discussion that the changes we create should be estheti- cally appealing and functionally sound too. It is our duty to carefully diagnose, analyze and deliver the best to our pa- tients. The crown reduction should be as conservative as possible. Aim has to be less reduction of tooth structure and greater esthetics and durability. This simply means that esthetic dentistry has to be a multispecialty branch, wherein all treatments like periodontics, surgical pro- cedures have to be performed whenever deemed necessary.

References

1. Garg N, Jain AK, Saha S, Singh J. Es- sentiality of early diagnosis of molar inci- sor hypomineralization in children and re- view of its clinical presentation, etiology and management. Int J Clin Ped Dentis- try, 2012; 5(3): 190–196.

2. Lygidakis NA, Wong F, Jälevik B, Vier- rou AM, Alaluusua S, Espelid I. Best Clin- ical Practice Guidance for clinicians deal- ing with children presenting with Molar- Incisor-Hypomineralisation (MIH): An EAPD Policy Document. Eur Arch Paediatr Dent, 2010; 11(2): 75–81.

3. Taylor GD. Molar incisor hypominerali- sation. Evidence-Based Dentistry, 2017; 18(1):15–16.

4. Leal SC, Oliveira TRM, Ribeiro APD. Do parents and children perceive molar-inci- sor hypomineralization as an oral health problem? Int J Paediatr Dent, 2017; 27(5): 372–379.

5. Rajendran R, Sivapathasundharam B. Shafer's Textbook of Oral Pathology. 7th Ed. Elsevier, 2012.

6. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Pa- thology. 4th Ed. W B Saunders Company, 2015.

7. Hysi D, Kuscu O, Droboniku E, Toti C, Xhemnica L, Caglar E. Prevalence and ae- tiology of molar incisor hypomineralisa- tion among children aged 8-10 years in Ti- rana, Albania. Eur J Paediatr Dent, 2016; 17: 75-79.

8. Crombie FA, Manton DJ, Weerheijm KL, Kilpatrick NM. Molar insicor hypomineral- ization: a survey of members of the Aus- tralian and New Zealand Society of Paedi- atric Dentistry. Aust Dent J, 2008; 53: 160-166.

9. Rosenblum SH. Restorative and ortho- dontic treatment of an adolescent patient with Amelogenesis imperfecta. Pediatr Dent, 1999; 21(4): 289–292.

10. Seow WK. Clinical diagnosis and man- agement strategies of Amelogenesis imper- fecta variants. Pediatr Dent, 1993; 15(6): 384–393.

11. Rada RE, Hasiakos PS. Current treat- ment modalities in the conservative resto- ration of Amelogenesis imperfecta: a case report. Quintessence Int, 1990; 21(12): 937–942.

12. Seow WK, Amaratunge FA. The effect of acid etching on enamel from different clinical variants of Amelogensis imperfecta an SEM study. Pediatr Dent, 1998; 20(1): 37–42.

13. Venezie RD, Vadiakas G, Christensen JR, Wright JT. Enamel pretreatment with sodium hypochlorite to enhance bonding in hypocalcified Amelogenesis imperfecta: case report and SEM analysis. Pediatr Dent, 1994; 16(6): 433–436.