

Oral Presentations

Presented on 14 November, 2024

Combination of Er: YAG Laser Therapy with Resin Infiltration using Icon: Case Presentation

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Molar-Incisor Hypomineralization (MIH) refers to a condition of systemic origin with an as-yet-unknown etiology. It involves a dysfunctional mineralization process of the enamel, affecting the first permanent molars (one or more) and may or may not affect the permanent incisors (Weerheijm et al., 2001).

Clinically, hypomineralization can vary in size, with discoloration ranging from white to yellow or brown, impacting the patient's quality of life. The degradation of dental enamel facilitates biofilm accumulation since individuals with MIH often struggle with proper oral hygiene due to sensitivity in the affected teeth, thereby increasing the risk of dental caries development. Due to the sensitivity of these teeth, patients may experience pain, making it challenging to control during dental procedures.

In this case report, a dental desensitization protocol was developed using Er: YAG laser (Litetouch) with a wavelength of 2940nm, high absorption coefficient for water and hydroxyapatite (substances present in the tooth), along with conditioning of dental surfaces before applying the resin infiltrant ICON (DMG, Germany), thereby preventing post-eruptive fractures. Informed consent was obtained, allowing documentation and dissemination of the case.

It can be concluded that minimally invasive approaches to manage dental MIH are crucial in current dentistry, aiming for satisfactory aesthetic results and well-being in sensitivity control within a single session for individuals with chromatic alterations due to DDE, without any preparations or damage to dental structure.

Molar Incisor Hypomineralisation (MIH) Detection Using Photographic Scoring Among Dental Therapists in Malaysia

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Background/ Aim: In Malaysia, dental therapists (DTs) through their involvement in school dental services are uniquely positioned to assist with MIH early detection and intervention. However, most DTs reported that they have not received sufficient training in this area. Thus, the MIH early detection and intervention training module (MIH-EDIT) was developed and implemented among DTs. The study objectives were to 1) compare DTs' scores for MIH detection using photographic scoring (PS) before (T0), immediately after (T1) and two weeks after implementing the MIH-EDIT (T2) and 2) determine association between DTs' sociodemographic characteristics and their PS at T1.

Methods: In Phase I (Development), module content development and validation, consensus photographic scoring and pilot study were carried out to finalise the module materials and study instrument. In Phase II (Implementation and Evaluation), the MIH-EDIT e-booklet was distributed and a 1-day training was implemented among DTs in Sarawak. Calibration exercise using digital clinical photographs was conducted at T0, T1 and T2. Each correct answer was awarded 1 point and 0 points for each wrong answer based on the gold standard (minimum score=0, maximum score=32). Data was analysed using descriptive statistics, repeated measures ANOVA and associations were determined using ANCOVA.

Results: The MIH-EDIT was implemented among 187 DTs (89.9% response rate). There was a significant increase ($p<0.001$) in the mean PS from T0 (13.94±4.52) - T1 (21.41±5.04) and T0 - T2 (20.14±5.50). There was a significant decrease ($p<0.001$) from T1 - T2. The mean PS for DTs with a clinical job scope

(21.35±4.89) was significantly higher ($p=0.025$) compared to those with administrative job scope (18.62±5.57) at T1.

Conclusions: Within the study limitations, the MIH-EDIT improved the DTs' ability to detect and distinguish MIH from sound teeth, caries and other DDEs over the short-term, especially among DTs with a clinical job scope.

Three Years Clinical Success of Glass Hybrid and Short Fiber Reinforced Composite on Molar Incisor Hypomineralization

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Background/Aim: This study aimed to evaluate the 36-month clinical performance of two different restorations on molars affected by molar incisor hypomineralization (MIH) and carious lesions.

Methods: Thirty-one children aged 6 to 12 years (18 female, 13 male) with at least two carious permanent first molars diagnosed with severe MIH were randomly assigned as follows: group one equals GH (Equia Forte®HT) and group two equals SFRC (EverX Flow™) covered by micro-hybrid composite (G-Aenial®posterior composite). Sixty-two molars were restored in a split-mouth design. In all subjects, selective caries removal was performed to completely remove caries from the cavosurface walls and to leave only soft dentin on the pulp chamber. The performance of the restoration was assessed based on modified United States Public Health Service (USPHS) criteria at the initial evaluation and subsequent follow-ups at 6, 12, 24, and 36 months post-treatment. Data was analyzed using SPSS 26.0 software (IBM Corp., Armonk, NY, USA) and the Generalized Linear Model (GLM). P

Results: Sixty-two restorations (31GH, 31SFRC) were analyzed in 31 children with a mean age (\pm standard deviation) of 7.50±7.69 years. In this study, after 36 months, 80.7% of GH restorations were successful for marginal adaptation and 90.3% for retention. SFRC restorations showed 93.6% retention success and 96.8% marginal adaptation success. Both restorations showed 100% acceptable results in other modified USPHS criteria. While the time variable was statistically significant ($p<0.001$), restoration type, sex, age, and tooth type did not significantly affect the clinical success of restorations in terms of main effects ($p>0.05$).

Conclusion: Composite restorations employing SFRC and GH with selective caries removal demonstrate similar clinical success when utilized in the selective caries removal approach for managing permanent molars affected by molar incisor hypomineralization.

Concentration of MMP20 and KLK4 during Enamel Development in MIH/SPMH Affected Teeth

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Introduction: During the secretory stage of amelogenesis, ameloblasts secrete many specific proteins, amelogenins and non-amelogenins. The degradation of these proteins during maturation stage is performed by two proteases, MMP20 and KLK4.

Objectives: To determine the concentration of MMP20 and KLK4 during amelogenesis on MIH/SPMH affected teeth in comparison with healthy children.

Design: The concentration of MMP20 and KLK4 were determined from blood samples of 500 children aged 0-5 years old. Four years later a sample of 89 children from the examined group (now aged 6-7 years) were clinically examined for MIH/SPMH signs on their permanent or deciduous molars by trained residents, according to EAPD criteria.

Results: 25 children showed signs of MIH/SPMH out of 89. The concentration of MMP20 and KLK4 were statistically correlated with the appearance of MIH/SPMH in comparison with healthy children. In children

with clinical signs of MIH/SPMH the concentrations of KLK4 were significantly lower (4.99 in comparison with 7.84 in control group; P value=0.02). The concentration of MMP20 was higher in the MIH/SPMH group but without statistical significance (P value=0.24).

Conclusions: KLK4 is expressed during the transitional and maturation stages and is responsible for degradation of residual amelogenins and fragments from nonamelogenins into small polypeptides. In reduced concentration of KLK4, it may be suggested that substantial retention of enamel proteins will occur in the enamel during maturation stage, clinically observed as MIH/SPMH after teeth eruption.

Unilateral Molar Incisor Hypomineralisation Alters the Masticatory Pattern and Stomatognathic System

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Background/Aim: Molar Incisor Hypomineralisation (MIH) is associated with dental hypersensitivity and post-eruptive enamel breakdown, having a negative impact on the oral-related quality of life in children. Due to its heterogeneous and asymmetrical presentation, MIH often more severely affects one side of a dental arch, possibly leading to masticatory repercussions. This study aims to assess the masticatory pattern and muscle activity in children with unilateral MIH.

Methods: After ethics approval (CAE: 12161019.2.0000.5419), two cross-sectional observational studies were conducted following the STROBE guidelines. In the first study, children (7 to 11 years-old, both sexes) divided into three groups (45 Mild Unilateral MIH; 42 Severe Unilateral MIH; 35 control group - children with unilateral complaints of pain/difficulty in chewing). The preferred chewing side was assessed as described by McDonnell et al. (2004) and through standardized questionnaires. Data were analysed by comparative statistical analysis and binomial logistic regression. In the second study, 14 children with unilateral MIH had muscular activity of masseter and temporalis muscles on both sides evaluated using surface electromyography in postural and dynamic conditions (rest, right/left laterality, protrusion, chewing of hard and soft food). Data from the ipsi- and contralateral sides to the MIH were compared using the Wilcoxon test. A statistical significance level of 5% was set.

Results: Children with severe unilateral MIH showed a higher frequency (p<0,05) of deviation in chewing to the opposite side of the defect compared to the control group (52% vs. 24%). In addition, Severe MIH group increased the probability of deviation in chewing to the opposite side [Odds Ratio (95% CI): 3.57 (1.32 - 9.69); Severe MIH – Control; p=0.026]. There was higher electromyographic activity in the masseter and temporalis muscles contralateral to the defect.

Conclusion: Unilateral Severe MIH causes alterations in the masticatory pattern and stomatognathic system in children.

Knowledge, and Attitudes of Turkish Dentists Towards Endodontic Treatment of Molar Incisor Hypomineralisation (MIH): A Questionnaire Study

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Background/Aim: This study aims to evaluate the knowledge, attitudes, and treatment preferences of Turkish dentists for the management of molar incisor hypomineralization (MIH).

Methods: After obtaining the ethics approval, an online survey that contained 27 questions was conducted and distributed via Google Forms. The questions of a survey that had minor modifications were based on previously validated questionnaires. Following the demographic data and theoretical perspective, clinical photos and radiographs were included in the survey. The survey was conveyed to the specialists of every

branch of dentistry and general dental practitioners by e-mail and social media. Chi-squared and Fisher's exact test was performed for statistical analysis using SPSS.

Results: A total of 750 dentists (42.2%), general dental practitioners and 57.9% specialist or postgraduate students) participated in the survey. The survey was conducted by dentists from every region of Türkiye. Most dentists (70.9%) received MIH education in the undergraduate curriculum. The rate of encountering MIH was high at 76.1%. However, interest in MIH after graduation is quite low. Most dentists (93%) did not participate in any lecture about MIH. For the management of MIH, composite filling and prefabricated stainless-steel crowns were the most preferred materials ($p < 0.05$). Approximately half of dentists (43.5%) experience anesthesia failure during the treatment of MIH-affected teeth. In the management of a tooth with moderate MIH, fissure sealant, and fluoride varnish were preferred by 53.9% and 30.3%, respectively, while 7.9% of dentists did not prefer any treatment. For severe MIH, half of the dentists (50%) declared that they performed restoration with a stainless-steel crown. When the presence and absence of germ of a wisdom tooth in panoramic radiography, endodontic treatment preferences of dentists were 73% and 63%, respectively.

Conclusions: Turkish dentists prefer endodontic treatment and restoration instead of early first molar extraction for permanent first molar with severe MIH cases.

Dentists' Knowledge about Molars Incisors Hypomineralization (MIH) and Deciduous Molar Hypomineralization

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MIH is a developmental qualitative enamel defect of the first permanent molars with or without involving the incisors. characterized by reduced quantity of calcium and phosphorus which affect enamel quality.

MIH is not sex related and its worldwide prevalence has been estimated to be between 2% to 40%. In Israel, MIH prevalence is estimated to be around 17-18%. The etiology of MIH is multifactorial with putative genetic component, maternal habits and health during pregnancy especially at the third trimester, and infant and child illnesses. Recently an association has been reported between the concentration matrix proteins including (MMP20) and (KLK4) during the maturation stage of amelogenesis and the development of MIH.

Goal: To collect information about the level of knowledge, diagnostic ability, and correct treatment of general dentists\ specialists\ young dentists vs. experienced dentists in various fields in MIH.
Methods: A questionnaire was distributed to 400 dentists in Israel. The questionnaire was anonymous and did not include any identifying information, except for the dentist's level of professional training in dentistry and their years of professional experience.

Results:

1. Specialized/expert dentists have more extensive knowledge and experience in the identification and diagnosis of MIH/DMH than general dentists. This is likely due to their additional training and experience
2. Experienced dentists (with more than 10 years of experience) have more extensive knowledge and experience in the identification and diagnosis of MIH/DMH than young dentists. experience is an important factor in the ability to identify and diagnose MIH/DMH.
3. Specialized/expert dentists have more extensive knowledge and experience in the treatment and prevention of MIH/DMH than general dentists.
4. Experienced dentists (with more than 10 years of experience) have more extensive knowledge and experience in the treatment and prevention of MIH/DMH than young dentists.