



Current Best Practice and Standardized Protocol for Pediatric Dentists in Treating Molar Hypomineralization

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Introduction

Molar hypomineralization (MH) is defined as qualitative developmental enamel defect involving any number of the permanent first molars and possibly the permanent incisors.⁵ The hypomineralized defects range from white and/or brown spots to soft and porous enamel sometimes leading to a post-eruptive enamel breakdown of the affected teeth.¹ The burden related to MH is well-recognized, continuing to draw public and professional interest.

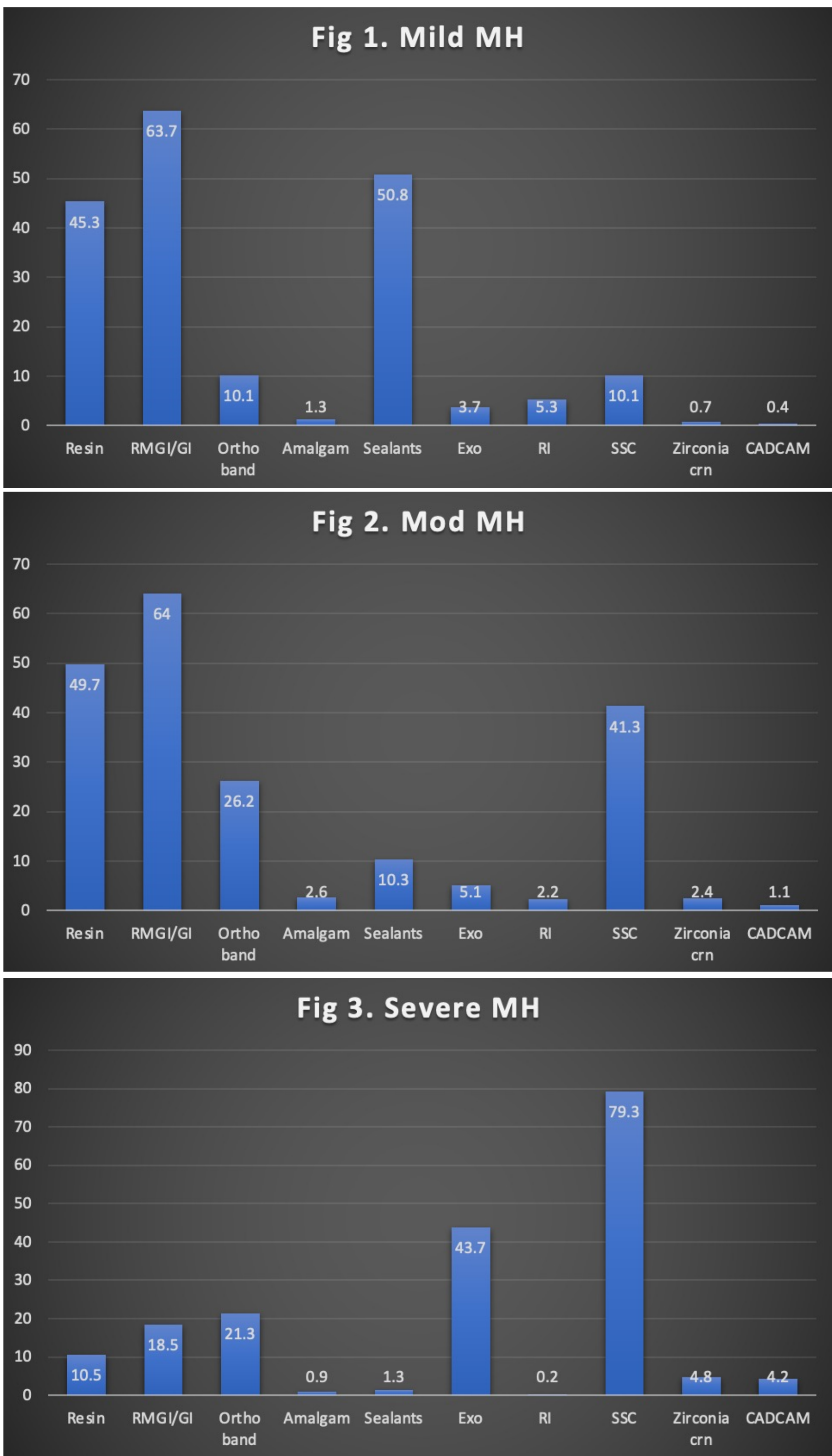
One fourth of children with MH need clinical intervention due to extensive caries, hypersensitivity, reduced quality of life, and post eruptive breakdown. Although information on the structural, mechanical, and chemical properties of MH-affected teeth has been gained in recent years, restoring MH-affected teeth remain a major challenge and several aspects regarding the restorative treatment of these teeth remain unclear.⁴ This raises the questions of whether preparation of the tooth (e.g., complete removal of MH-affected enamel) is needed, additional pretreatment of the tooth substance is required, and whether one restorative material is more advantageous than another. There is a lack of standardized care protocol for treating MH-affected molars by dentists. The aim of this study is to assess how MH is recognized and treated by pediatric dentists, and to compare long-held existing treatment modalities (GI, SSC, amalgam, interim molar bands, Hall technique, resin composite) to newer methods such as ICON resin infiltration and full coverage zirconia/CAD/CAM crowns. Assessing the current trends in practice may help to provide data that lends itself to establishing a standardized, evidence-based recommendation for practice.

Methods

This was a cross sectional study consisting of a 15 item questionnaire sent out via email to members of AAPD (American Academy of Pediatric Dentistry) including residents, practicing clinical and academic pediatric dentists. The questionnaire assessed participants' level of training, background knowledge, preference of selected method of treatment for MH-affected molars. It was hosted by SurveyMonkey to meet the security standards for the transmission of online data. Transport layer security protocol was used to encrypt and transmit data which were frequently backed up in an encrypted storage. To ensure anonymous responses, no IP addresses were collected. The statistical analysis involved calculation of frequencies and Cross tabulations. Frequencies of preferred mode of treatment for mild, moderate, severe MH were collected and summarized into relevant bar charts. Cross tabulation and statistical significance were calculated to analyze each objective individually.

Results

Out of 455 surveys (5%) returned, 40.2 % pediatric dentists had < 10 years of experience and 59.8 % >10 years, with 62% of practitioners seeing MH. Providers with >10 years saw MH more frequently ($P=0.034$) and post-eruptive breakdown ($P=.001$). Allowing multiple selection of treatment modalities, glass ionomer (RMGI/GI); fissure sealants (FS); and resin composite (RC); from highest to lowest were preferred for mild MH (fig1). Subsequently, RMGI/GI; RC; Stainless steel crown (SSC); were preferred for moderate (fig2). Lastly, SSC; extraction; RMGI/GI; were preferred for severe (fig3).



Discussion

Fig 1. Factors considered for selecting restorative technique for Mild MH

- RMGI/GI for chemical bonding fluoride releasing
- stabilization until potential future custom crown placement
- Patient's age
- Conservative techniques and conservation of tooth structure
- Long term prognosis and predictability

Fig 2. Factors considered for selecting restorative technique for Moderate MH

- Reasons for selection: 47% cooperation of patient, 20.4% length of procedure, 18% cost
- Patient and parental preference
- Conservation of tooth structure
- Future restorative options
- Extent of cuspal involvement
- Long term prognosis and predictability
- Thermal sensitivity
- Ability to achieve anesthesia

Fig 3. Factors considered for selecting restorative technique for Severe MH

- SSC (88.1%) preferred over zirconia crown (2.9%) and CAD/CAM (5.3%)
- Long term prognosis
- Consideration for 2nd molar substation
- Patient and parental preference
- Age of patient
- Long term prognosis
- Minimize retreatment in the future
- Hygiene and orthodontic factors
- Invasiveness of procedure

In restoring all levels of severity of MH, 21.3% of practitioners removed carious tissue only, 72.5% preferred removing carious tissue and severely hypomineralized tooth structures, while 4.6% Removed all carious and all hypomineralized tooth structure. Only 14.7% reported being very familiar with ICON RI and 86.4% reported consensus on a need for standardized protocol in treating MH.

Conclusions

For Mild MH, treatment of choice was RMGI/GI; Moderate was RMGI/GI; Severe was SSC. Due to known positive factors including moisture control, fluoride release, and chemical bonding, providers often preferred RMGI/GI. Full coverage restoration was preferred for severe MH. As Due to benefits of using SDF and RI in reducing hypersensitivity in mild/moderate MH and benefits of longevity in using ceramic full coverage restorations, more research needs to be conducted in such novel restorative methods.

Research
Survey Q.



References

