

INTRODUCTION

Hypomineralization of enamel is defined as a qualitative enamel defect caused by a disturbance during initial calcification and/or maturation.¹ The estimated global prevalence reported for MIH is around 13%.¹

The etiology is multifactorial and is thought to be the result of systemic environmental factors during the first three years of life, that affect enamel development during the pre, peri, or early post-natal phases of life.^{1,2,3} Despite the presence of many studies and theories investigating potential factors involved in the occurrence of MIH, the causation is still inconclusive.^{1,4}

Clinically, MIH presents as demarcated enamel opacities that can manifest as white, cream, yellow, or brown defects and are sharply delineated against normal enamel.^{3,4} The enamel shears off under masticatory force and can result in post-eruptive breakdown (PEB). The compromised teeth are more prone to caries, sensitivity, and more frequent need for dental treatment.³

CASE REPORT

PHASE I



A 3-year-old patient presented at clinic with all 4 first-primary molars and 1 primary canine (#H) affected by hypomineralization with enamel breakdown and moderate to high hypersensitivity according to Wong-Baker faces pain scale (WBS).

Treatment

- 5% NAF Fluoride varnish (Duraphat®, Colgate, USA) was applied for hypersensitivity in follow up appointments.
- Glass ionomer sealants (GI) and restorations (Vitrebond™ and Ketac™ Cem Easy mix – 3M ESPE, USA) were applied (#A, #J, #K, #T) for sensitivity and decay prevention, and reapplied as needed.
- Composite restoration was placed on tooth #H.
- Hypersensitivity was monitored and decreased from 4 to 2 according to WBS after sealants and restorations.

PHASE II

At this stage, patient is 5-6 years old, has permanent first molars erupted and presents with hypomineralization. Enamel breakdown was observed on teeth #J, #14, and #30, with different severities. Tooth #24 and #25 erupted presenting MIH with no enamel breakdown or sensitivity.

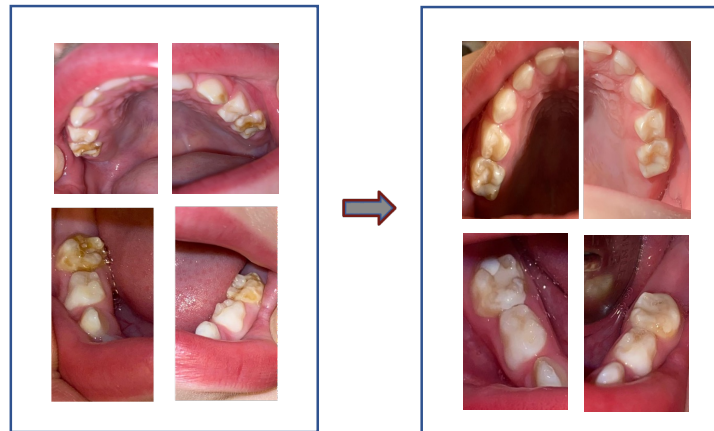
Treatment

- On the monitoring sessions before proceeding with restorations, occlusal GI sealants were performed on all erupted permanent first molars immediately after occlusal areas were exposed in the oral cavity.

• The following **toothpaste protocol** for use at home was put in place for preventing cavities, reducing tooth sensitivity and promoting remineralization: Two different toothpastes, one containing casein phosphopeptide amorphous calcium phosphate fluoride (CPP-ACFP - GC MI Paste plus®, GC, USA) and the other containing 5000 ppm F⁻¹ (Clinpro™, 3M, USA) were prescribed twice a week each on alternate days for each paste.

- After restorations and sealants and implementing the toothpaste home protocol for a month, the sensitivity level dropped to 0 according to the WBS pain scale, and no signs of decay were observed.
- Restoration with stainless steel crown (SSC), composite restorations and a core build-up were performed as shown on phase II table.

PHASE I – PREVENTION OF DECAY AND TREATMENT OF HYPERSENSITIVITY



PHASE II – REEVALUATION OF PREVIOUS TREATMENT AND RESTORATIONS



PROVIDERS: DR FERNANDA RITTO, DR ASHLEY BLEDSOE COOK AND NATALIE ZHANG (DS4).

TOOTH	PHASE I BEFORE TREATMENT			PHASE I AFTER TREATMENT		
	HYPERSENSITIVITY* (WBF)	DECAY	ENAMEL BREAKDOWN	HYPERSENSITIVITY*	DECAY	ENAMEL BREAKDOWN
#A	YES (4)	NO	YES	YES (2)	NO	RESTORED WITH GLASS IONOMER
#J	YES (4)	NO	YES	YES (2)	NO	RESTORED WITH GLASS IONOMER
#K	YES (3)	NO	YES	YES (1)	NO	RESTORED WITH GLASS IONOMER
#T	YES (4)	NO	YES	YES (2)	NO	RESTORED WITH GLASS IONOMER
#H	YES (3)	NO	YES	NO (0)	NO	RESTORED WITH COMPOSITE

*According to Wong-Baker Faces (WBF) pain scale.

TOOTH	PHASE II BEFORE TREATMENT			PHASE II AFTER TREATMENT		
	HYPERSENSITIVITY*	DECAY	ENAMEL BREAKDOWN	HYPERSENSITIVITY*	DECAY	ENAMEL BREAKDOWN
#A	YES (2)	NO	YES – WITH PROXIMAL	NO (0)	NO	RESTORED WITH SSC**
#J	YES (2)	NO	YES	NO (0)	NO	RESTORED WITH COMPOSITE
#K	YES (1)	NO	YES	NO (0)	NO	RESTORED WITH COMPOSITE
#T	YES (2)	NO	YES – WITH PROXIMAL	NO (0)	NO	RESTORED WITH SSC**
#14	YES (3)	NO	YES	NO (0)	NO	RESTORED WITH COMPOSITE
#30	YES (3)	NO	YES – WITH PROXIMAL	NO (0)	NO	CORE BUILD UP

*According to Wong-Baker Faces pain scale. ** stainless steel crown

SCAN FOR REFERENCES



DISCUSSION

Conservative approach is the first treatment choice for MIH according to the current literature, since affected teeth are often not completely erupted yet, have wide pulp chambers, and high pulp horns.^{4,5} Nevertheless, treatment of MIH can be very challenging, and clinicians must be able to find the delicate balance between traditional conservative treatment, and more invasive options due to the fast course that this condition may present.⁵

The treatment plan for the present case started with prevention of decay, hypersensitivity control, and enamel loss monitoring. Remineralization agents were applied to teeth with enamel breakdown to decrease hypersensitivity, and to increase enamel quality for future bonding processes. Furthermore, sealants and restorations with glass ionomer were preferred on initial approach.

Glass ionomer sealants have the advantage of releasing and recharging fluoride, in addition to a less sensitive technique. Remineralization protocols before sealant can increase retention and sealed molars have demonstrated 77% less chance of caries than unsealed.^{3,4,5} Regarding hypersensitivity, different materials (CPP-ACP, CPP-ACFP, and Fluoride) showed good results, and the association of protocols can provide even better outcomes.⁵

Sodium Fluoride varnish (5%), CPP-ACP, and CPP-ACFP demonstrated excellent performance in decay prevention, especially in creamy-white defects.^{3,5} This was the basis for our decision to establish a home protocol for desensitization, remineralization, and decay prevention. Also, frequent recall intervals of 3 to 6 months and enhanced preventive measures were performed on the present case.⁵

Stainless-steel crowns can be an alternative approach for severe cases or temporary treatment in extensive destructed teeth.² For the present case, the use of prefabricated SSC was indicated on primary teeth when loss of enamel on the proximal surfaces would lead to loss of space in the arch.

Adhesion to enamel is a challenge for MIH-affected teeth, and most of the studies showed low bond strength values.^{3,4,5} When a 5th generation prime/bond adhesive agent was used on resin sealants and composite restorations, retention was substantially increased in MIH-affected teeth.^{4,5} Therefore, on the present study, direct restorations with composite were performed following the bonding protocol with a 5th generation adhesive.

CONCLUSION

FINDINGS

- Each tooth can be affected differently, showing a different degree of hypersensitivity and different characteristics of the enamel on the same patient.
- The degree of severity of enamel breakdown that affected the deciduous dentition did not determine the degree of severity of the enamel breakdown of the permanent dentition that erupted on the same quadrant.
- Yellow-brown defects showed a poor prognosis with faster enamel breakdown.

TREATMENTS

- An early association of remineralization protocols with desensitizers and placement of sealants showed good results in controlling painful symptoms and decay.
- Home tooth paste protocol proved to be an important adjuvant in treating hypersensitivity and preventing decay.
- Close monitoring with recall interval of 3 to 6 months proved to be very important to obtain early treatment decision and success on results.
- The development for additional protocols for management of MIH is needed.