



Combination of Articaine and N2O for Pediatric Patients with MIH: Case Report

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ABSTRACT

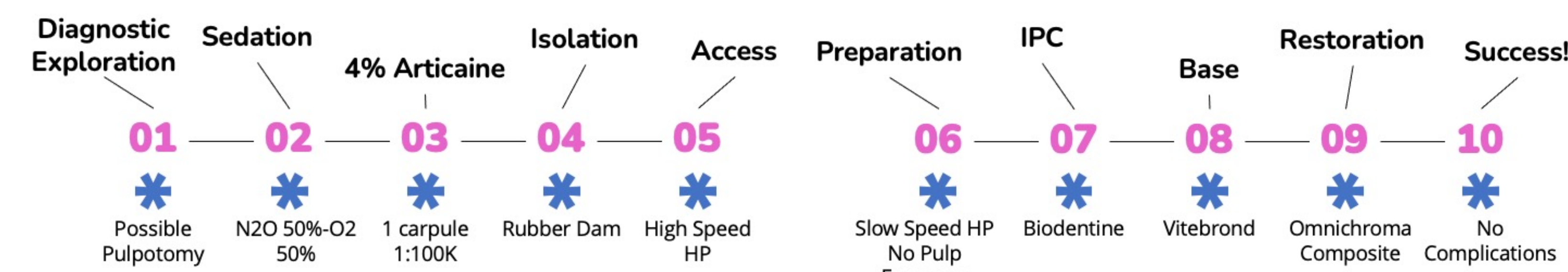
Molar Incisor Hypomineralization (MIH) is a frequently faced dental condition worldwide. It is a developmental condition of systemic origin resulting in enamel defects in one or more first permanent molars (FPMs) associated regularly with affected incisors. MIH patients present with tooth hypersensitivity due to pulpal inflammation triggered by porous enamel and exposed dentin; the difficulty in attaining local anesthesia due to altered nerve potential affects the success of the treatment and the patient's behavior. Early diagnosis and planning are crucial since rapid destruction of tooth structure may occur. This case will present another challenging encounter by pediatric dentists when treating young patients, such as dental fear, odontophobia, dental anxiety, and other behavior problems. The indication of moderate sedation considered these clinical difficulties. This article aims to report a clinical case combining the use of articaine and nitrous oxide as the clinical strategy in managing MIH pediatric patients during dental treatment.

BACKGROUND

MIH is a qualitative defect of enamel development that primarily affects the dental enamel of permanent molars and may also affect the incisors. With hypomineralization, teeth are more porous and susceptible to wear due to masticatory forces and demineralization processes, such as dental caries. Although the etiology is not fully understood, it is believed that genetic and environmental factors may be associated. MIH is a global concern in oral health, and the prevalence of this condition can reach up to 44%. Patients with MIH often require dental interventions, up to 10 times more than patients without the condition. The accelerated evolution of dental caries, the difficulties in establishing adequate restorative procedures, and the difficulties in children's cooperation in the dental office make the clinical management of patients with MIH a challenge in the dental environment. Problems in the child's behavior can occur due to dental fear and anxiety during clinical procedures, especially concerning dental pain. Regarding pain, enamel porosity may provide the dental hypersensitivity observed in patients with MIH. Painful sensations can affect oral hygiene habits and increase the risk of dental caries, as well as difficulties in anesthetizing and pain control, which can lead to anxiety and behavioral problems during clinical care. Some children are just too fearful of receiving necessary dental care. In that situation, conscious sedation with nitrous oxide may be recommended to help improve the child's dental experience. Research has suggested that articaine can diffuse through hard and soft tissue from a buccal infiltration to provide lingual or palatal soft tissue anesthesia, which is more effective in anesthetic success in mandibular first permanent molar areas.

CASE REPORT

A 10-year-old male patient was referred to our clinic from the endodontic department of our School of Dental Medicine to evaluate the possibility of using nasal sedation to complete proposed dental treatment. During the anamnesis, the patient was highly phobic and reported being very afraid of dental anesthesia. Clinical examination revealed enamel defects (hypomineralization) in facial surfaces of teeth 8 and 9, and occlusal buccal surfaces of permanent molars 19 and 30, confirming the diagnosis of MIH. Also, teeth 3 and 14 were missing indicating the possibility of also been affected with hypomineralization. Radiographic exam revealed deep occlusal cavities 19 and 30 near the pulp. Upon endodontic evaluation tooth 19 was diagnosed with pulp necrosis and tooth 30 with reversible pulpitis. Due to the persistence of odontophobia, inhalational sedation with nitrous oxide and oxygen was chosen as the clinical strategy for performing vital pulp therapy in combination with 4 % articaine as local anesthetic.



IMAGING



Figure 1-4: Pre-Operative X-rays



Figure 5: Dental Procedure

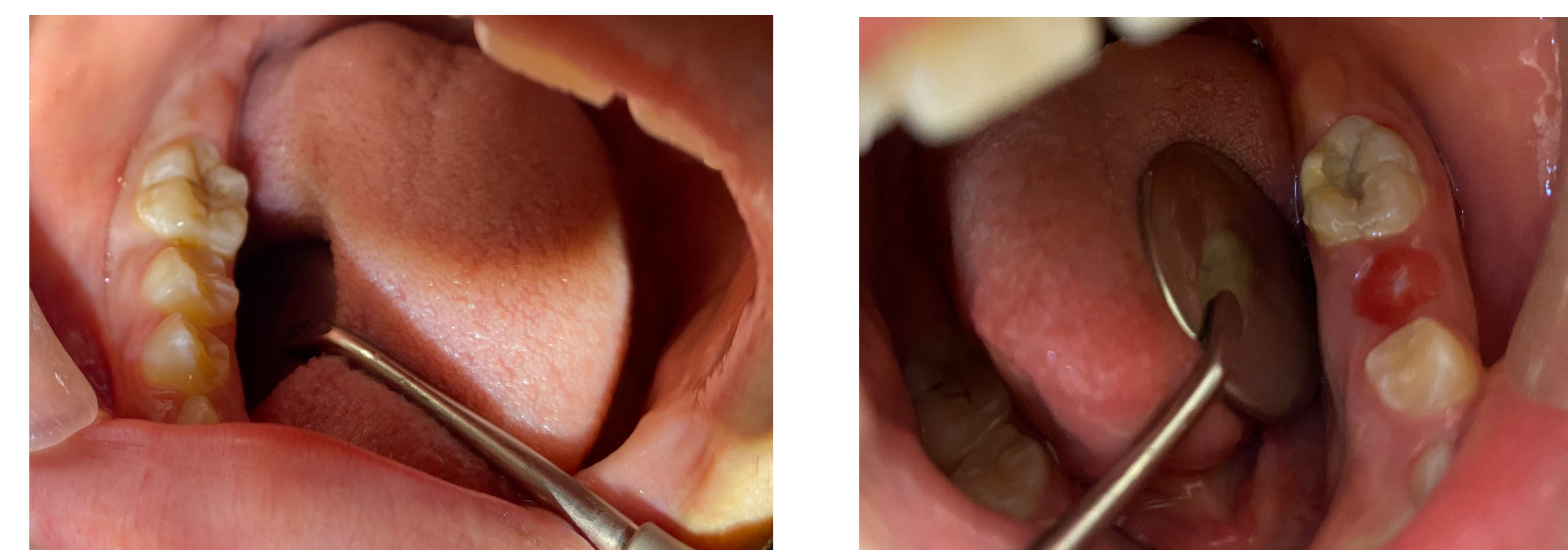


Figure 6-7: Pre-Operative Inferior FPMs Pictures



Figure 8: Vitals Signs Monitor

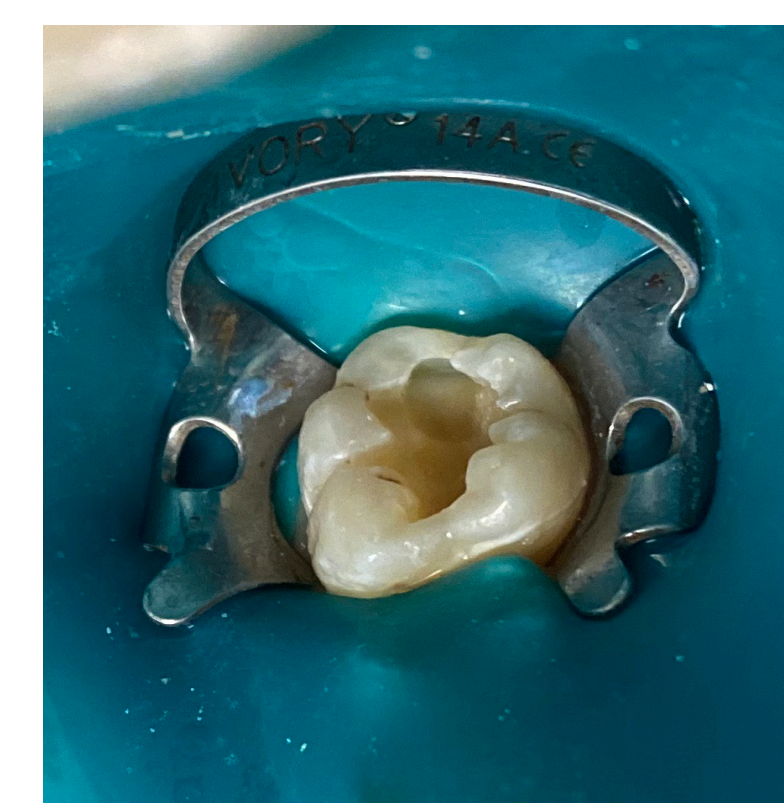


Figure 9: Preparation



Figure 10: Pre-Operative Front View Pictures



Figure 11: Final Restoration

CONCLUSION

The patient responded adequately to the sedation technique and was calm throughout the restorative procedure. There were no complications. Success in using behavior management techniques can be measured by completing the proposed/necessary treatment. In this clinical case, using inhalation sedation with N2O and Articaine 4% as a local anesthetic was a strategy to enable the performance of dental procedures in the Pediatric patient with MIH. Nitrous oxide has been shown to be an effective, low-risk, and safe alternative for controlling fear and anxiety.



ACKNOWLEDGMENT

Cheryl Paulo Malave, DMD
Emilio Agrait Defillo, DMD

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