

Clinical case

Management of Enamel Hypomineralisation in Anterior Teeth of a Toddler with Clinpro™ XT Varnish, with the Use of Minimally Invasive Dentistry (MID). Case Report

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Received: june 2021

Accepted: september 2021

Cite:

Iturbe Jiménez OM, García Pérez A, Nieto Sánchez MP, Lira Urbina T. Management Of Enamel Hypomineralisation In Anterior Teeth Of A Toddler With Clinpro™ XT Varnish, With The Use Of Minimally Invasive Dentistry (MID). Case Report. *Rev Odont Mex.* 2022; 26(2): 66-70. DOI: 0.22201/fo.1870199xp.2022.26.2.87326

Abstract

Introduction: Hypomineralization is defined as a quantitative defect of the enamel characterized by a lack of enamel production in certain areas of the enamel matrix. **Objective:** To present a management of enamel hypomineralization with Clinpro™ XT Varnish. **Case presentation:** A one year

and eight months old patient is presented, in which minimally invasive dentistry (MIS) was used in the management of enamel hypomineralization with Clinpro™ XT Varnish in anterior teeth of the older infant. The enamel hypomineralization was successfully covered on the surfaces of teeth 51 and 61, preserving the tooth enamel structure. The dental structure was preserved by means of a remineralizing material, achieving a minimally invasive esthetic and preventive treatment. **Conclusions:** Currently, minimally invasive treatments are the guideline in oral rehabilitation in pediatric dentistry, and the prognosis of the results observed in the long term reflect a positive impact on oral health related to quality of life in patients.

Keywords: Enamel hypomineralization, older infant, Minimal Intervention Dentistry, Clinpro™ XT Varnish.

INTRODUCTION

Enamel development defects are classically classified as delimited opacities, diffuse opacities and hypoplasias. Opacities are defined as a qualitative enamel defect characterized by a decrease in mineralization (hypomineralisation), while enamel hypoplasia is defined as a quantitative enamel defect resulting from its lack of production in certain areas of the enamel matrix¹.

Worldwide, dental caries is a public health problem that affects both the child and adolescent. In Mexico, the prevalence of cavitated lesions in the school population is approximately 34%². In order to preserve the teeth in the oral cavity, different preventive methods have been developed, among them is MID.

MID is defined as the maximum preservation of tooth structure, with the aim of preserving teeth until advanced age. This trend involves dietary guidance, prevention actions depending on caries risk, as well as the use of dental materials that allow us to perform restorations while preserving the greatest amount of dental tissue³. Likewise, new diagnostic tools for the detection of caries lesions, such as the *International Caries Detection and Assessment System* (ICDAS), the *Caries Management by Risk Assessment* (CAMBRA) protocol and specific preventive treatments have reduced the need for early restorative interventions^{4,5,6}.

Preventive treatments include the use of Clinpro™ XT Varnish (Durable Fluoride-Releasing Coating, 1 - 10g Clicker™ Dispenser, 3M ESPE, # 12248), is a resin-modified glass ionomer material. One of the advantages of this varnish is the release of fluoride ions on the surface of the restoration and the absorption of calcium and phosphate ions. It is used as a site-specific protective coating for enamel and dentin surfaces⁷. The results of the clinical trials revealed that the Clinpro™ XT Varnish has good effectiveness in preventing cavitated dentin lesions for 24 months^{8,9}. The aim of this case report is to perform a preventive, aesthetic and minimally invasive treatment with Clinpro™ XT Varnish following the MID protocol.

CLINICAL CASE PRESENTATION

A one-year-and-eight-month-old patient presented to the Paediatric Stomatology Specialty Clinic of the School of High Studies (in Spanish Facultad de Estudios Superiores, FES) Iztacala. First, informed consent was discussed with the child's mother, who gave written authorisation

for his treatment; subsequently, the patient's medical history was taken. As a reason for consultation, the child's mother said that his "front teeth are stained."

During the oral examination, the presence of enamel hypomineralisation was observed in the middle third of teeth 51 and 61, diagnosed based on Russell's periodontal index¹⁰. One of the most outstanding aspects of the clinical history is the intake of antibiotics during the seventh month of gestation (Figure 1A).

Treatment: a minimally invasive technique was used to treat the hypomineralisation that the teeth presented, using a microabrasion with the application of 15% hydrochloric acid (HCl) for two minutes on the affected surface, the surface was washed with water and then dried with sterile gauze (Figure 1B). Clinpro™ XT Varnish was then used to cover and provide aesthetics, and remineralization of the area was ensured. Following the manufacturer's instructions, the application was carried out using a fine blunt-tipped applicator on the hypomineralized enamel surface. Finally, each tooth was light-cured for twenty seconds.

Results: the hypomineralisation of the enamel present on the surfaces of teeth 51 and 61 was covered; at the same time, the tooth structure was preserved (Figure 1C). Figure 1D shows the result of the minimally invasive aesthetic and preventive treatment at six months follow-up.

DISCUSSION

Through the use of Clinpro™ XT Varnish, hypomineralisation of the enamel present on the surfaces of the teeth can be covered, as well as provides aesthetics and protects the tooth surface².

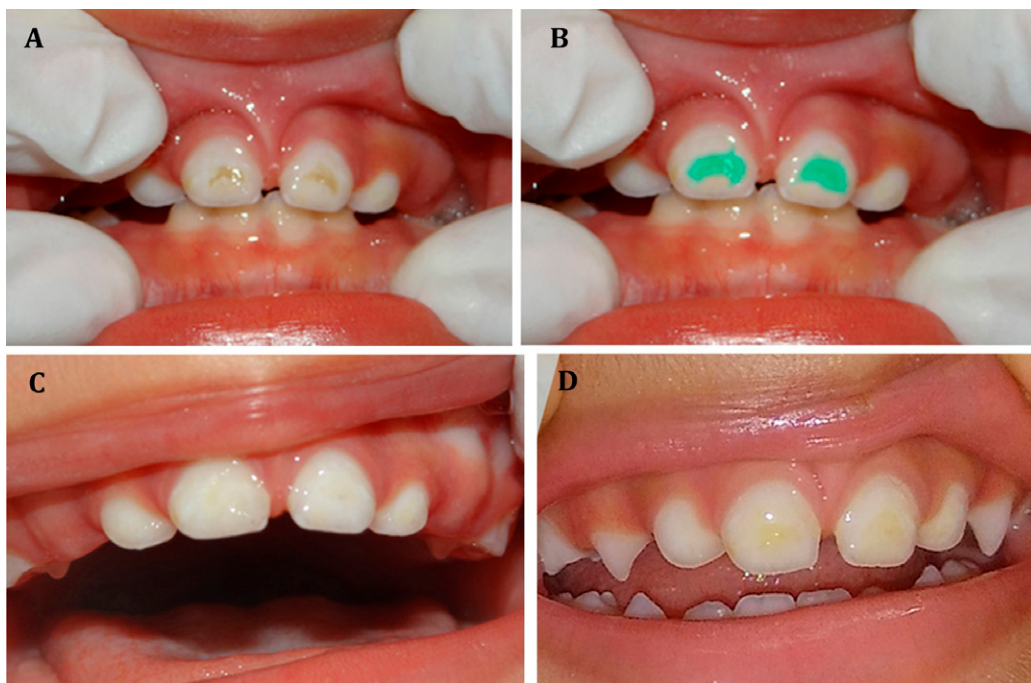


Figure 1. Initial and final photographs of the pediatric patient's treatment
A. Hypomineralisation of the teeth 51 and 61. B. Application of 15% HCl for two minutes. C. Completion of treatment. D. Results at six months follow-up.

The MID has proposed a different approach for addressing incipient and cavitated caries lesions through a minimally invasive technique, with the aim of preserving most of the tooth structures in both the primary and permanent teeth. Some of its advantages are that it reduces the time of the restorative procedure and decreases pain and stress, resulting in a decrease in anxiety in the pediatric patient. Likewise, it is a concept of dental care based on the evaluation of caries risk and the application of current therapies to prevent, control and treat the disease¹¹.

Brostek *et al.*, mention that dental caries is not only demineralisation, but a process of repeated cycles of demineralisation caused by a mismatch in the ecological and chemical balance of the oral biofilm-teeth interface. Also, related factors such as diet, lifestyle, frequency of carbohydrate consumption, oral hygiene, use of fluorides, among others, play an important role in the presence of dental cavities¹².

The support of parents is very important, since the oral health of their children will depend on them until around 8 years of age, after which the pediatric patient has acquired the motor skills to brush on their own. Hamilton *et al.*, in a study that included children aged two to five years, found that parental supervision for their children's tooth brushing was 74%. Interventions are needed to increase parental involvement in children's oral hygiene practices, with the goal of curbing the rise in oral health conditions and diseases¹³.

Although Clinpro™ XT Varnish is a site-specific protective coating for enamel and dentin with great advantages in preventing the onset and progression of dental caries, it is not a definitive restoration, so preventive measures should continue with the dentist to avoid the presence of cavities.

It is important to mention that oral health is an integral part of children's overall health. Caries is a chronic multifactorial disease with important short and long-term consequences. Since younger children visit the pediatrician more frequently than the dentist, it is important for pediatricians to be informed about caries prevention and available interventions such as MID with the goal of maintaining and restoring pediatric patient oral health¹⁴. Lastly, it is important to go for regular dental check-ups in order to prevent, diagnose and treat injuries such as enamel hypomineralisation and thus reduce the possibility of them evolving into carious lesions¹⁵.

CONCLUSION

Currently, minimally invasive treatments are the guideline in oral rehabilitation in pediatric dentistry, and the prognosis of the results observed in the long term reflects a positive impact on oral health related to quality of life in patients. One of the main objectives of IMO is prevention, which can be achieved with the use of Clinpro™ XT Varnish, because it protects and remineralises tooth enamel and can remain on the dental organs for six months or more, thus helping to reduce incipient caries lesions.

Finally, it is important to mention that Clinpro™ XT Varnish treatments are fast, reducing time in the dental office, reducing stress in paediatric patients, and therefore achieving better behavioural management and confidence in children.

CONFLICT OF INTERESTS

There is no conflict of interest between the authors.

BIBLIOGRAPHIC REFERENCES

1. Salanitri S, Seow WK. Developmental Enamel Defects in the Primary Dentition: Aetiology and Clinical Management. *Aust Dent J*. 2013; 58(2): 133-40; quiz 266. DOI: 10.1111/adj.12039
2. Frencken JE, Peters MC, Manton DJ, Leal SC, Gordan VV, Eden E. Minimal Intervention Dentistry for Managing Dental Caries - A Review: Report of a FDI Task Group. *Int Dent J*. 2012; 62(5): 223-43. DOI: 10.1111/idj.12007
3. Villanueva Gutiérrez T, Barrera Ortega CC, García Pérez A, González-Aragón Pineda AE. Relationship between Molar Incisor Hypomineralization (MIH) Severity and Cavitated Carious Lesions in School-children. *Acta Odontol Latinoam*. 2019; 32(3): 133-40.
4. Ericson D, Kidd E, McComb D, Mjör I, Noack MJ. Minimally Invasive Dentistry-Concepts and Techniques in Cariology. *Oral Health Prev Dent*. 2003; 1(1): 59-72.
5. Murdoch-Kinch CA, McLean ME. Minimally Invasive Dentistry. *J Am Dent Assoc*. 2003; 134(1): 87-95. DOI: 10.14219/jada.archive.2003.0021.
6. Ericson D. What is Minimally Invasive Dentistry? *Oral Health Prev Dent*. 2004; 2 Supl. 1: 287-92.
7. Sharma H, Gupta C, Thakur S, Srivastava S. Comparative Evaluation of Calcium Phosphate-Based Varnish and Resin-Modified Glass Ionomer-Based Varnish in Reducing Dentinal Hypersensitivity: A Randomized Controlled Clinical Trial. *Eur J Dent*. 2017; 11(4): 491-5. DOI:10.4103/ejd.ejd_127_17
8. Cabral RN, Faber J, Otero SAM, Hilgert LA, Leal SC. Retention Rates and Caries-Preventive Effects of Two Different Sealant Materials: A Randomised Clinical Trial. *Clin Oral Investig*. 2018; 22(9): 3171-7. DOI: 10.1007/s00784-018-2416-z
9. Terenzi M, Botan TG, Lopes de Oliveira GJP, Zandim-Barcelos DL, Sampaio JEC. Effectiveness of Clinpro™ XT in Reducing Dentin Permeability and its Resistance to Acid Challenges. *Oral Health Prev Dent*. 2018; 16(4): 339-44. DOI: 10.3290/j.ohpd.a40956.
10. Russell AL. The Differential Diagnosis of Fluoride and Non Fluoride Enamel Opacities. *J Public Health Dent*. 1961; 21: 143-6. DOI: 10.1177/002203459006905138
11. Murdoch-Kinch CA, McLean ME. Minimally Invasive Dentistry. *J Am Dent Assoc*. 2003; 134(1): 87-95. DOI:10.14219/jada.archive.2003.0021
12. Brostek AM, Bochenek AJ, Walsh LJ. Minimally Invasive Dentistry: A Review and Update. *Shanghai Kou Qiang Yi Xue*. 2006; 15(3): 225-49.
13. Hamilton K, Cornish S, Kirkpatrick A, Kroon J, Schwarzer R. Parental Supervision for their Children's Toothbrushing: Mediating Effects of Planning, Self-Efficacy, and Action Control. *Br J Health Psychol*. 2018; 23(2): 387-406. DOI:10.1111/bjhp.12294
14. Section On Oral Health. Maintaining and Improving the Oral Health of Young Children. *Pediatrics*. 2014; 134(6): 1224-9. DOI: 10.1542/peds.2014-2984
15. Schwendicke F, Frencken JE, Bjørndal L, Maltz M, Manton DJ, Ricketts D, et al. Managing, Carious Lesions: Consensus, Recommendations on Carious Tissue Removal. *Adv Dent Res*. 2016; 28(2): 58-67. DOI: 10.1177/0022034516639271.