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Enamel Microabrasion in Pediatric Dentistry: Case Report

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Abstract
Enamel microabrasion technique is a conservative method that improves the appearance of the tooth by restoring bright and superficial smoothness, without causing significant structural loss. It is a safe method that may be used even in the treatment of young children. This paper describes the microabrasion technique using Opalustre® (Ultradent Products, Inc) applied over incipient carious lesions which were remineralized but pigmented, aesthetically compromising deciduous teeth.

Key words: Deciduous tooth; Enamel microabrasion; Pediatric dentistry.
Introduction

The first report about hydrochloric acid application used to improve the aesthetics of teeth with fluorosis was done by Dr. Kane in 1916. Since the results obtained were favorable, researches were developed in order to verify the effectiveness of the microabrasion technique using different concentrations of hydrochloric acid (6.6% to 18%) and phosphoric acid (30% to 40%) in association with abrasives. The objective of these researches was to obtain a long-lasting result that was safe, even for deciduous teeth.

Literature shows that this technique should be considered as the first treatment option when trying to improve the aesthetics of teeth that present intrinsic stains (fluorosis) or extrinsic superficial enamel stains. The clinical result obtained is directly related to the depth of the stains/defects and, thus, the differential diagnosis of such alterations is essential.

Microabrasion is effective, safe and may be used in order to improve the aesthetics of children and adolescents, as long as the patient is cooperative. This technique causes reduced wear of tooth surface and minimum discomfort to the patient.

The purpose of this paper is to illustrate the microabrasion technique using Opalustre® (Ultradent Products, Inc) applied over inactive white spot lesions which had been pigmented and were present on deciduous teeth.

Case Report

A five-year-old male patient sought treatment at the Specialization in Pediatric Dentistry clinic of the São Paulo State Dentists’ Syndicate. No relevant systemic alteration was observed during anamnesis, except for the use of a medication containing ferrous sulfate. The mother signed an informed consent, allowing the treatment of her child. During clinical examination, it was noted that the child presented great coronal destruction of the upper deciduous incisors, occlusal cavities on the molars, inactive white spot lesions with brown stains added to superficial cavities on the buccal and proximal surfaces of the deciduous canines and molars.

The first step of the treatment involved the removal of the infected areas and the modification of dietary and oral hygiene habits. After accomplishing this first step, the microabrasion technique using Opalustre® (Ultradent Products, Inc) was chosen to aesthetically improve the teeth that presented pigmentation. This material contains hydrochloric acid at 6.6% and silicon carbide microparticles, it is purple and it comes in syringes.

The sequence of the enamel microabrasion technique with Opalustre® (Ultradent Products, Inc) used in this clinical case was: topical anesthesia; infiltrative anesthesia; isolation by rubber dam of the upper left quadrant (primary canine and first and second molars) (Figure 1); dental prophylaxis; application of 1 mm of the product (Figure 2); abrasion using a rubber cup in slow speed and under slight compression during 10 seconds (Figure 3); abundant rinsing after each application, followed by visual observation of the removal of the spots and of the smoothness of the wet surface. After 4 application of Opalustre®, done in a single session, it is possible to visualize the removal of stains and the aesthetic improvement on the wet surface.
without need for aesthetic reconstruction. After polishing the region with felt discs and paste at slow speed (Figure 4), a neutral fluoride gel at 2% was applied during 1 minute (Figure 5). Removal of the stains required 4 applications, done in a single session, and a vitreous aspect of the surface was observed, with immediate aesthetic improvement. At the maintenance appointment, after 1 month (Figure 6), it was observed that the shiny aspect and the surface smoothness were maintained and that there was absence of pain or sensitivity on teeth that had been treated with microabrasion.

Discussion

The aesthetic treatment has not exclusively concerned adults. Children and their parents are becoming more and more appreciative of a beautiful smile during childhood, seeking and demanding resolutions to aesthetic problems. According to Welbury and Shaw (1990)\textsuperscript{15}, aesthetic problems may psychologically affect patients, especially teenagers, and may interfere in their social life.

Literature shows that enamel microabrasion should be the first option of treatment because it is a procedure that is less invasive and more conservative. It only requires a small amount of structure removal, it doesn’t cause post-operative pain or sensitivity, and, in the majority of cases, it can be done in a single session causing minimum discomfort to the patient\textsuperscript{1,7,10,16-18}. Other advantages of this technique include: immediate,
permanent and lasting results due to the fact that microabrasion involves the removal of the stain instead of just covering up the stain or altering the enamel; shorter time required for the procedure which is easy to execute; elimination of the need for dental cavity preparation or restorative materials; it does not cause injuries either to the pulp or to the periodontal tissue.

The association of an acid and an abrasive agent may be used in the treatment of teenagers and children who are at least 2 years old as long as protective measures are taken to keep save the eyes and the soft tissue. Such measures must be followed even when using a less concentrated acid. Therefore, rubber dam isolation is mandatory during the procedure for not only does it protect soft tissues but it is also comfortable, it stops material debris from falling into the mouth, it reduces contact with saliva, and it is a helpful tool for the behavior management of young patients.

In the clinical case reported, 4 applications of Opalustre®, done in one session, were necessary in order to remove the brown pigmentation found on the inactive carious lesions of primary maxillary teeth. After using the microabrasion technique, the coloration was improved and a shiny surface was obtained because, during the procedure, the demineralized layer is almost completely removed by the method. Mild surface abrasion of enamel demineralizes with simultaneous acid erosion leads to the formation of a compacted mineralized tissue within the organic areas, replacing the outer layer of prism-rich enamel with a densely compacted prism-free region. When light is reflected off this surface and refracted through it, it does so in a different manner than it would on an untreated surface, and these optical properties of the newly micro-abraded surface camouflage the remaining subsurface stains. This vitreous characteristic was observed in the clinical case presented and is known as the “abrosion effect” or “enamel glaze.”

Using microabrasion is also advantageous for the treatment of small structural losses in inactive carious lesions because the technique only causes a small amount of structure removal and it also forms a regular surface, thus decreasing the need for conventional restorative treatments. Because of the presence of superficial cavities on the buccal surfaces of the deciduous canines and molars was chosen a more abrasive technique. Paic et al (2008) shows that Opalustre® caused the highest tooth substance loss compared with other products, and Zuanon et al (2008) shows that mechanical technique (rubber cup attached to a low-speed handpiece) removed more enamel than manual microabrasion using a plastic spatula. The combination of Opalustre® and mechanical technique resulted in a surface without roughness and discarded the need for restoration with composite resin even in surfaces that presented small cavities.

**Conclusion**

The microabrasion technique using Opalustre® (Ultradent Products, Inc) was effective in the removal of inactive carious white spot lesions that had been pigmented after remineralization and to produce a regular surface even in surfaces that presented small cavities.

This technique presents a favorable and lasting aesthetic result, without causing significant enamel structural loss and without need for cavity preparations. Microabrasion may be done in a single session and it is safe to use even in young children.

In order to obtain a favorable and lasting aesthetic result, it is important to make an adequate diagnosis of the alterations found and the patient must be included in a preventive program to reduce caries risk and activity.

**References**


