Hybrid nano-resin esthetic crowns in primary teeth.

Case report

**Coronas estéticas de nano-resina híbrida en dientes temporales.**

**Reporte de caso**

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**INTRODUCTION**

Loss of primary anterior teeth due to caries, pulp disease and crown fractures has been recognized as one of the most severe etiological factors of dental problems in the field of pediatric dentistry. Trying to preserve primary incisors is important not only to achieve proper chewing and phonation; abnormal habits can develop, furthermore, aesthetics would be another factor to consider.¹⁻⁷ Characteristics of the aforementioned lesions as well as crown morphology prompt the clinician to use restorations which will provide resistance durability, and above all, esthetics. Suitable esthetics is the most difficult goal to achieve.⁵ Pediatric dentists have sought different rehabilitation and prevention alternatives for primary anterior teeth.

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Due to the extensive caries frequently presented by children, treatments have mostly consisted on extractions and pulpectomies, and use of amalgam or chrome-steel crowns.6

Among others, materials used to restore primary anterior teeth are: light-cured resins, metallic crowns, pre-formed metallic crowns with esthetic front, poly-carbonate crowns and acrylic resin crowns. Chrome-steel crowns provide better resistance and durability but are inconveniently unesthetic.1,5,6

Resin restorations comply with esthetic requirements, nevertheless they exhibit secondary effects such as polymerization contraction which can cause an inter-phase at the adhesive union, post-operative pain, marginal discoloration, recurrent caries, and, finally, loss of the restoration.

Crowns made of light-heat-cured composite resins offer suitable adaptation: surface is homogeneous and free of pores, this confers appropriate esthetics and higher resistance to abrasion.1

The prismless layer can become a problem to achieve suitable adhesion; for this reason many authors suggest it should be eliminated.8,9,10

Composite resins used in the laboratory for indirect techniques optimize physical and chemical characteristics and generally polymerize through the use of physical methods (light, heat, pressure, etc.).1,7,11-14

The aim of the present study was to present a clinical case where rehabilitation of indirect composite resins was performed (Signum-ceramis-Heraeus).

CLINICAL CASE

An apparently healthy 3 year ten month old female patient attended the Pediatric Dentistry Clinic. The patient’s mother informed that «caries in the front teeth» was the reason for their visit. Clinical examination revealed caries in teeth 51 and 61, previously restored with resin and with frequent dislodgement history. Frankel IV conduct with normal occlusion (Figure 1).

METHOD

During the first visit, impressions were taken with irreversible hydrocolloid; and over the model teeth were carved with a 169 L bur, 1 mm were eroded at all sides, rounded borders without retention and shaping a cervical chamfer. The model was then sent to the laboratory in order to manufacture crowns, with shape and color specifications (Figures 2 and 3).

At the second visit, infiltration anesthesia was conducted (2% lidocaine and 1:100,000 epinephrine), in teeth 51 and 61, rubber dam isolation was performed. Preparation of the aforementioned teeth was achieved with a «pencil shape» tip burr, wearing down 1 mm at all sides, and rounded borders. Restorations were adjusted, the tooth surface was etched for 15 seconds, and an adhesive layer was applied, polymerization was promoted during 10 seconds, and finally teeth were cemented with dual resin (Figure 4). Restorations had previously been treated with hydrofluoric acid and silane application (Figure 5). Upper anterior restorations were completed preserving function and exhibiting high aesthetic value (Figure 6).

DISCUSSION

There are different treatment methods to restore the anterior sector of primary dentition, but not all of them meet the expectations of the pediatric dentist. One of the most used treatments is the use of chrome-steel crowns. They meet functionality requirements but are unaesthetic.5

Pre-formed metallic crowns with esthetic front are another option to restore the anterior sector;
nevertheless, they have shown to wear down, or experience fractures in the aesthetic front, this is due to the fact that masticatory forces are higher than what these crowns can endure.\textsuperscript{11}

Polycarbonate crowns are esthetically acceptable, but involve the disadvantage of eliciting poor gingival adaptation, this might lead to gingivitis caused by accumulation of dental plaque, teeth are worn down and pigmented.

Another treatment option would be direct resin crowns as well as celluloid crowns. This technique meets with aesthetic requirements but does not meet functionality requirements since these crowns frequently are dislodged or fractured.\textsuperscript{5}

Heat and light cured composite resins crowns exhibit suitable adaptation, homogenous surface and absence of pores, these characteristics confer proper aesthetics and higher resistance to abrasion.\textsuperscript{5} Composite resins for indirect techniques used in the laboratory optimize physical and chemical characteristics, and generally polymerize with the use of physical means (light, heat, pressure, etc.).\textsuperscript{1,5,12-20} The fact of dividing treatment into two periods shortens time require to complete each separate phase.\textsuperscript{5}

In the present case, crowns were decided upon since the patient had a history of resin restorations dislodgement, taking thus advantage of the adhesion to all the dental structure.

Heat-and light-cured composite resins were the selected restorative materials, since they met with durability and resistance criteria as well as aesthetics, which was of the utmost importance bearing in mind they were front teeth.\textsuperscript{5} They also decrease side effects of polymerization contraction. Even though cementing time was increased, no complications were encountered with the patient, whose behavior was very helpful.
CONCLUSION

Rehabilitation of primary teeth with laboratory pre-fabricated nano-hybrid-resin represents a suitable option in pediatric dentistry.

REFERENCES


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