

Human enamel veneer restoration in a deciduous tooth: clinical case

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Trauma to deciduous anterior teeth, frequently occur in children, and the treatment is a big challenge for the pediatric dentistry. In these cases, besides the pain and discomfort provoked by the injury, both child and parents/persons responsible were eager to reconstruct the damage, as soon as possible. In modern operative restorative dentistry, no restorative material is able to substitute for the human dental enamel in quality, color and resistance. The aim of this paper is to relate the treatment of esthetic veneer (facet) of human dental enamel in a three-year-old child after trauma that caused concussion and accentuated color alteration. Clinical results showed an efficient esthetical resolution, revealing it to be a good alternative for treatment of traumatized anterior deciduous teeth.

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INTRODUCTION

The treatment of traumatized anterior deciduous teeth represents a great challenge to the pediatric dentist. Esthetic solutions in restorative dentistry in pediatric dentistry are becoming increasingly difficult due to the number of the exacting levels demanded by the patients as well as to the complexity and quantity of material to be used with the available techniques.¹⁵ Also to be considered is the satisfaction of the patient in relation to the esthetic aspect. This aspect has the same level of importance as any other technical concept in the determination of the success of treatment.¹⁰

Human civilizations create their own concepts of beauty and esthetics, based on psychological, social, cultural and economical characteristics. Every individual has a perception of the ideal esthetic dental

composition, based on magazine models, television and the smiles of their favorite actors. The artistic ability of the pediatric dentist resides in creating for each patient, considering the restorative material limitations, a smile that projects resemblance, as close as possible, to the ideal of the patient.^{4,7}

Traumas frequently occur in children. In such situations, besides pain and discomfort provoked by the injury, both child and parents or those responsible are anxious to repair the damage, as soon as possible.

Multiple causes contribute to dental traumas, such as falls and collisions, sport activities, domestic violence, automobile accidents, physical assaults and/or altercations. Casual factors present in unique or combined circumstances, connected with the age of the patient combine to form a mosaic of traumatic injuries.⁹ Anterior teeth may be traumatized by various forms in infant patients, such as blows to the face during accidents, falls with objects between teeth, traumas in park playthings, or by accidents during sports. Anterior teeth injuries may also occur in automobile, motorcycle or bicycle accidents with esthetic consequences.¹⁶

Some other factors may significantly raise the dental susceptibility to trauma in infants and adolescents: malocclusion, overbite in excess of 4mm, short labial recovering and the syndrome of mouthbreather, among others.^{8,17}

The bonding of human teeth fragments is one of the techniques that may be used in repairing crown fractures.^{5,3} Besides this, dental fragments of another patient may also be used to restore dental crowns destroyed by caries.^{12,14} In fact, natural crowns obtained from human teeth banks have been used in

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Figure 1. Three-year-old female patient that suffered concussion in the upper central incisor (61). Fracture in enamel on the incisal edge and darkening of the tooth is observed.



Figure 2. Using retractor thread (Gengipak-Ultradente) for 60 seconds in tooth 61.

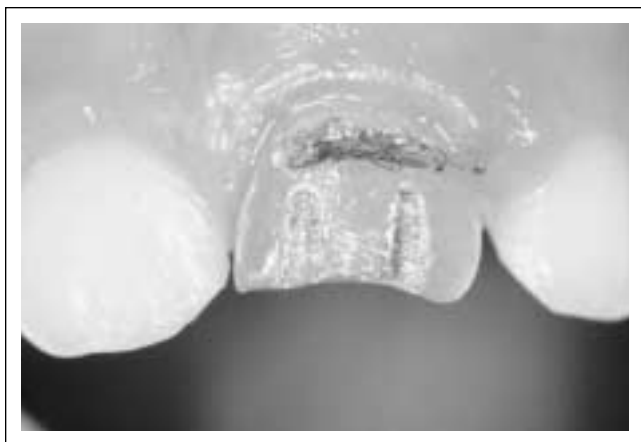


Figure 3. Cervical supra-gingival groove to orientate abrasion with controlled depth, restricted to the cervical region of 61 tooth. Two other grooves, mesial and distal in cervico-incisal direction, respecting the gingival body and incisal planes.

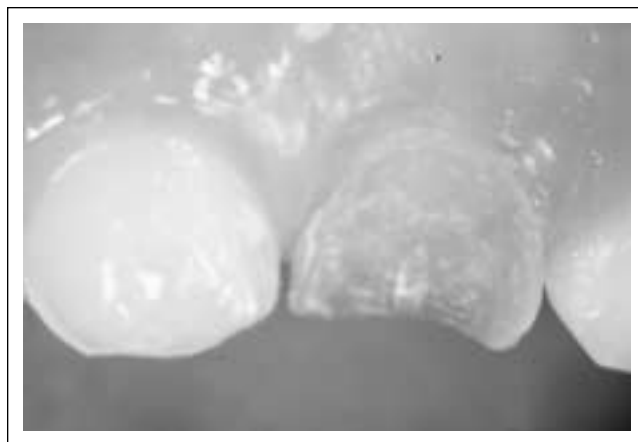


Figure 4. Removal of the entire surface delimited by the grooves in the vestibular face of tooth 61.

various clinical techniques and laboratory proceedings, including the restoration of anterior deciduous teeth.^{6,11,12}

To obtain satisfactory results in the esthetic resolution of traumatized anterior teeth, the pediatric dentist must be precise and meticulous in the technique of using composite resins and adhesive procedures.¹³ However, no existing restorative material in modern dentistry is able to substitute, in quality, color and resistance the human dental enamel. Considering this affirmation, the object of this paper is to relate the preparing and placement of the esthetic veneer (facet) of human dental enamel in a child, after trauma.

CASE REPORT

Three-year-old, female child presented with a clinical case of enamel fracture on the incisal edge (code N 502.50) and concussion (code N 503.20)¹ with pulpal necrosis and irre-

versible alteration in crown color in upper left central incisor (61) – (Figure 1). Extensive color alteration with high degree of darkening and consolidation of the tooth was observed.

After periapical radiographic exam, endodontic treatment was performed on the tooth. The option for the treatment was the direct mixed technique, using fragments of exfoliated natural deciduous tooth that showed size and color that closely resembled the patient's tooth (51). The selected tooth came from the Banco de Dentes Humanos da Universidade de São Paulo/USP (Human Tooth Bank, São Paulo University/USP). The persons responsible for the child were consulted about the usage of human tooth fragments and agreeing with the treatment, signed the necessary authorization.

After prophylaxis with water and pumice and relative isolation, gingival retraction with retractor thread (Gingipack-Ultradent) was performed for 60 seconds

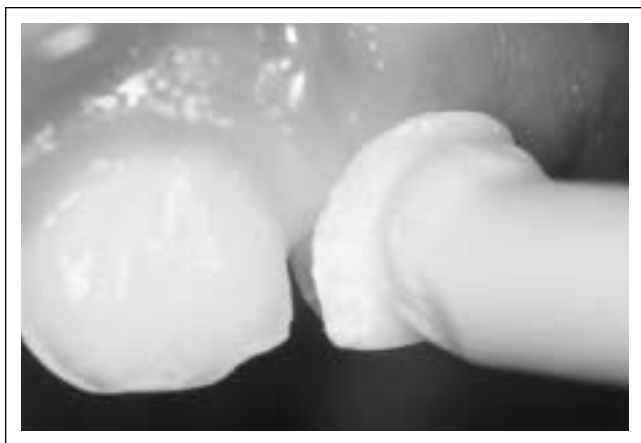


Figure 5. Human enamel facet adapted as perfectly as possible to remaining dental. Observe rod of gutta-percha to position and maintain facet in place.

(Figure 2) to enable extension of preparation approximately 0.2mm below gingiva. Using a spherical diamond point (K.G. Sorensen # 1011) a cervical supragingival canal to orientate abrasion was delimited, with controlled depth (half the size of the active part of the point used) restricted to the cervical region. By using a spherical tronco-conical point with rounded end (K.G. Sorensen #2135) two other orientation canals, mesial and distal, in the cervico-incisal sense were made, respecting gingival body and incisal planes (Figure 3). Grinding was performed on all of the surfaces delimited by the canals with a diamond tronco-conical point (K.G. Sorensen #3520). The cervical margin was extended subgingivally (0.2mm approximately) and ended in chamfer. The proximal margins extended slightly beyond the contact areas (0.2mm approximately). The incisal margins extended as far as the incisal edge (Figure 4).

The buccal enamel fragment was previously autoclaved and prepared as a veneer or facet. Then the facet was tested and adapted as perfectly as possible to the remaining tooth, using a rod of gutta-percha to maintain it in position (Figure 5). Following absolute isolation, the prepared tooth and the enamel facet received prophylaxis with water and pumice. They were washed and dried and conditioning with 35% phosphoric acid for 30 seconds. (Figures 6 and 7).

Once conditioned, adhesive was applied (Singlebond – 3M) on the prepared tooth and homogeneous facet. The enamel facet was then positioned and united to the tooth by using multiuse fluor-enforced adhesive cementation (Dentsply/Caulk). Cement excess was removed and light-cured (Optilux 500 – Demetron). During finishing, the contour of the tooth was perfected and all excess removed with a fine diamond point (Series F and FF – K.G. Sorensen).

Then the isolation was removed and polishing done with sequential abrasive rubber (Viking), aluminum

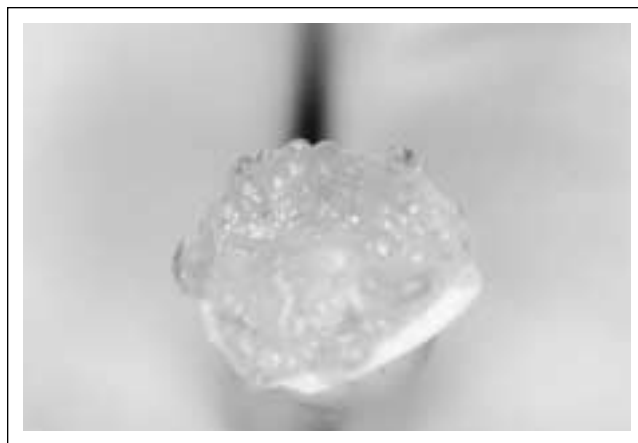


Figure 6. Conditioning in facet of human enamel with phosphoric acid gel at 35% for 30 seconds.

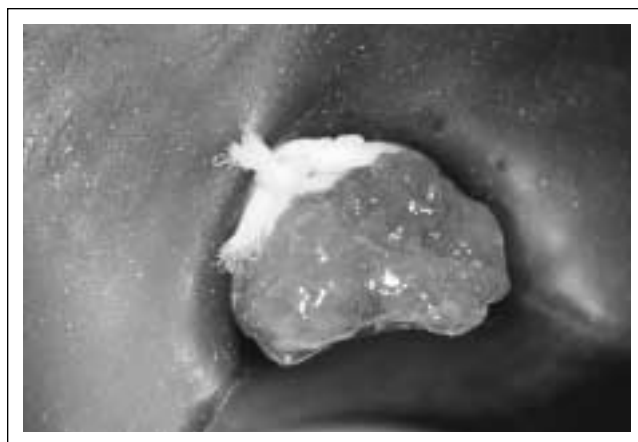


Figure 7. Conditioning in remaining dental with phosphoric acid gel at 35% for 30 seconds.

oxide strips (3M) and composite resin polishing paste (Caulk – Dentsply).

Occlusion was checked with carbon film (Occufilm). A layer of adhesive was then applied to the surface for giving the tooth a lifelike aspect (Figures 8 and 9).

COMMENTS

Currently, the satisfaction of the patient in relation to the esthetic is determinant and indispensable for the success of the treatment.¹⁰ Clinical results obtained in this procedure demonstrated efficient esthetic resolution with the satisfaction of the patient/parent and in this way success of the treatment.

After trauma the child patient and relatives were anxious to repair the damaged tooth as soon as possible. In this clinical case shown, the tooth had suffered severe concussion, with pulpal death and color alteration of the tooth, which was bothering the patient and relatives from an esthetic point of view.



Figure 8. Esthetic facet of human enamel done in tooth 61 after cementation and finishing.



Figure 9. Final aspect of restoration on tooth 61 in which human enamel facet was used.

The use of an esthetic facet prepared from human dental enamel taken from an exfoliated tooth represented a very efficient solution. Considering that deciduous teeth exfoliate naturally, it seems to us that the usage of this dental element does not include ethical discussion. It is important to emphasize that the dental material used came from the “Banco de Dentes Humanos da Universidade de São Paulo/USP” (Human Teeth Bank of São Paulo University/USP) which is registered, following the basic rules for organ donation and is monitored by the “Vigilância Sanitária do Estado de São Paulo” (Sanitary Vigilance, São Paulo State – Brazil). This teeth bank receives donations of exfoliated deciduous teeth from children with the parents/responsible authorization.

Nowadays, we perceive that our patients are more demanding, they want solutions that restore the lost natural condition, or even solutions that repair alterations such as color, texture, form, position, thus obtaining a final congruous and natural result.¹⁵

Using human tooth facet in this clinical case produced the desired effect. However, we must always emphasize that restorative materials presently in use, as modern and efficient as they might be, can only emulate nature.

Esthetic facets are, in principle, restorations that must be restricted to enamel, although they may, in some situations, be extended inside the dentin. The depth of the preparation aims to create the space that may enable a thickness of the restoration material capable of disguising the darker color of the background, without making the restoration excessively artificial and the tooth much more fragile.² The use of human enamel esthetic facet helped to block the dark color of the background, as the human enamel characteristics were more efficient than resinous material employed. The technique described for the use of esthetic facet from human enamel obtained from teeth bank showed to be a viable alternative in restoration

treatment of patients with darkened teeth. Natural enamel has physiological wear and presents a much smoother surface, consequently with a smaller deposition of dental biofilm.¹² For the clinical case was described in this paper, the use of human enamel resulted in clinical success, returning to the restored element its esthetic and adequate functions. The technique used was found to be adequate and feasible to treat anterior deciduous teeth.

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