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UNCOMPLICATED CROWN FRACTURE TREATMENT OF ANTERIOR PRIMARY TEETH: A CASE REPORT

Irlan de Almeida Freires, Ronaldo Lira Júnior, Ednara Mércia Fernandes de Andrade, Ana Maria Gondim Valença

ABSTRACT

Crown destruction of anterior primary teeth is a very common problem in the pediatric dental care. The major implications include neuromuscular imbalance with decreased masticatory efficacy, speech disturbances, development of parafunctional buccal habits and psychological problems. This paper reports the management of a fractured deciduous anterior tooth and its reconstruction using a celluloid matrix filled with composite resin, simulating natural dentition.

Key Words: Tooth Fracture; Deciduous; Esthetics; Composite Resins.

Introduction

Crown destruction of primary anterior teeth due to early childhood caries and fractures resultant from trauma is a very common problem in the pediatric dental care.¹ The implications of this situation include neuromuscular imbalance with decreased masticatory efficacy, speech disturbances, development of parafunctional buccal habits and psychological problems.² It is essentially important to restore crowns destroyed by caries to preserve the integrity of primary dentition until its exfoliation and eruption of permanent teeth.³ This same assumption may be applied to crown fractures, especially if there is dentin exposure, once a decay development process might be initiated on the tooth fractured surface. Satisfactory restoration of such teeth, improving esthetics, along with management of space and function has always been a challenge for pediatric dentists.⁴ According to Sahana et al., the full coronal restorations are indicated in cases of caries present on multiple surfaces, discolored teeth that are aesthetically displeasing, anterior teeth that have received pulp therapy or teeth fractured that lost most of their structure, among other clinical contexts.³ In this sense, many restorative options exist for treating primary anterior teeth. The choice of restorative technique depends upon the operator preferences, esthetic demands by the patient/parents and child's behavior that affect the ultimate outcome of which ever restorative material chosen.³ The most esthetic restorative option for carious primary incisors is the bonded strip crown.⁵ This is the first choice of many clinicians due to the superior esthetics and the ease of repair if the crown should subsequently chip or fracture.⁶

The celluloid crown form that historically has been used for strip crowns represents an advantageous option for restoration of primary teeth with non-complicated fractures. It is a crown form filled with composite that is bonded on the tooth. The main advantages are: parent/patient pleasing, simple to fit and trim, removal is fast and easy, easily matches natural dentition, leaves smooth shiny surface, easy shade control with composite, superior esthetic quality, large selection of size, among others.³ Yet, this is a sensitive technique, in which adequate tooth structure is required and any lapses in patient selection, moisture and hemorrhage control, tooth preparation and resin placement can lead to failure.^{6,7} Thus, the indication of this procedure depends on a meticulous analysis of

each specific case. The clinical case presented herewith is a reconstruction of primary anterior tooth with a non-complicated crown fracture by using a celluloid crown form. This paper reports the management of a fractured deciduous anterior tooth and its reconstruction using a celluloid matrix filled with composite resin, simulating natural dentition.

Case Report

A 5 year 11 months old girl, melanoderma, was presented by her mother to the Pediatric Dental Clinic at Federal University of Paraíba complaining of trauma with crown fracture in an anterior upper tooth. The child had been being supported by that service since 2009. Her medical history was unremarkable, excepting for such history of dental trauma. At that time, all procedures regarding the trauma were accomplished and an esthetic restoration using resin composite was performed in the right maxillary lateral deciduous incisor. In the second semester 2010, the child was returned to the clinic complaining of fracture of the incisor's restoration. According to her mother's report, the tooth had been fractured again when the child was playing at school. The child's diet statement revealed a very cariogenic diet. Besides the sucrose present in the juice and yoghurt, she also used to consume chocolate, candies and cookies in a high frequency. A diet re-orientation was done, especially with regards to the between-meal snacks. During anamnesis, no harmful habit was reported or observed, which could influence the occlusion. Clinical examination revealed a mixed dentition, Angle class II subdivision left, absence of open- or cross-bite and of curve of Spee.

The Gingival Bleeding Index⁸ and Simplified Oral Hygiene Index⁹ showed a low gingival inflammation activity and regular hygiene, respectively. In the following session, the fractured tooth reconstruction was performed, which is going to be reported in this paper. Clinically, an uncomplicated crown fracture reaching the tooth cervical third and involving enamel and dentin was observed (Figure 1). The child did not report pain to percussion and palpation, and the tooth had no mobility. A periapical radiograph was requested to investigate the fracture extension (Figure 2). Through assessment of the case, taking into account the child's age/behavior, aesthetical demand and tooth structure remaining, it was opted to build up the crown by using composite resin molded by a celluloid

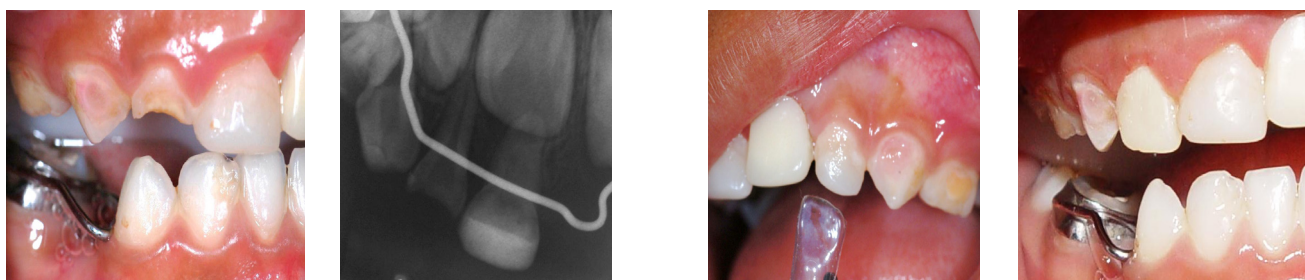


Figure 1. Clinical aspect of the non complicated crown fracture in the right maxillary lateral deciduous incisor. The fracture reached the cervical third and dentin exposure can be observed, Figure 2. Periapical radiograph revealing a fracture in the right maxillary lateral deciduous incisor involving only enamel and crown dentin, Figure 3. Selecting appropriate celluloid crown according to the mesio-distal diameter of the homologous teeth (Left maxillary lateral deciduous incisor), Figure 4. Final aspect of right maxillary lateral deciduous incisor after reconstruction using a celluloid crown form filled with resin composite.

crown form. Prophylaxis with dental pumice and water was made on the fractured tooth and surrounding elements. Then, an anatomical celluloid crown was selected according to the mesio-distal diameter of the homologous tooth (Figure 3). The gingival portion of the crown form was contoured with a curved scissors and gingival-incisal height was set. Crown adaptation to the tooth cervical region was observed in all sides. In order to allow the flow of excess of resin, once the crown form would be pressed against the remaining tooth, a hole was made in the crown lingual face by using an explorer No.5. The crown form was filled with a light-cured micro fill composite for enamel. The tooth was etched with 37% phosphoric acid for 30 seconds on the enamel and 15 seconds on the dentin and then washed for 30 seconds using a water syringe. After tooth drying, Scotch bond was applied and air thinned. The crown form was placed over the fractured tooth and excess material flowed through the hole in the lingual face. The composite was light cured for 40 seconds on the facial and on the lingual. The crown form was removed with an explorer, and initial finishing was done by using sandpaper strips. Occlusion was then checked and adjusted. In the subsequent session, were carried out the final finishing and polishing (Figure 4). A 10-month follow-up was conducted to investigate the long-term clinical performance of the technique. According to the ethical principles regarding human beings, the patient's parent has signed an informed consent form, allowing the publication of the case for scientific purposes.

Discussion

Esthetic restoration of primary anterior teeth can be especially challenging due to the small size of the teeth, close proximity of pulp to tooth surface, relatively thin enamel and surface area for bonding, and issues related to child behavior.¹⁰ Although the indirect crown reconstruction is used as a restorative treatment option in pediatric patients due to reduced clinical time in the dental chair, it requires laboratory phase and a larger number of sessions. Thus, the direct reconstruction is a viable alternative which yields good results.¹¹ In this sense, many studies in the literature have demonstrated that the use of celluloid matrix filled with composite resin to restore teeth anatomy and function is an esthetically effective and

practical approach.^{3,4,6,12-14} As seen in the present case, the use of a celluloid crown form has resulted in clinical success as well as recovered function and esthetics. It's pointed out that the fractured tooth in this case was vital and had sufficient surface area, what provided a proper bonding, no need for endodontic treatment and intracanal post. The technique described in this case is relatively simple, but it requires professional expertise to prepare and to adapt the celluloid crown in the cervical margin. Otherwise, a periodontal irritation would be induced by the excess of restorative material in the biological space. The maintenance of primary teeth in the oral cavity until their physiological exfoliations is of great importance not only to provide masticatory efficiency, proper speech and aesthetics but also to prevent installation of unwanted oral habits and social/emotional problems. Thus, the concept of promoting oral health care needs to extrapolate the care centered only on caries and periodontal diseases. It is fundamental to extend the care to the prevention of oral traumas, or at least to reduce their impact. In this context, the professional must be able to rehabilitate aesthetically and functionally the coronal fractures of primary teeth.¹⁵

Conclusion

The reconstruction of primary anterior teeth by using celluloid crowns provides both functional and aesthetic restorations for the child, what reflects on masticatory efficiency, increased self-esteem and also phonetic improvements. Allied to this, that conservative technique involves low cost, an easy and fast clinical performance, besides requiring only conventional restorative materials like composite resin. Nevertheless, once this is a temporary procedure, it becomes essentially important a clinical and radiographic follow up of the child until the appropriate exfoliation of the primary tooth and eruption of the respective permanent.

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How to cite this article

Freires I.A., Júnior R.L., de Andrade E.M.F., Valença A.M.G.: *Uncomplicated crown fracture treatment of anterior primary teeth: A case report*. *Int. J. Dent. Clinics*. 2012;4(3): 40-42.

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Source of Support: Nil

Conflict of Interest: None Declared