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Case Report

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# Restorative treatment on permanent teeth with enamel hypoplasia caused by trauma to the primary predecessors

## Abstract

This report describes a typical case in which injury to the primary central incisors resulted in morphological changes in the germ of permanent successors. The permanent incisors erupted with enamel hypoplasia, which were treated seven years after the trauma, with a light-cured composite resin restoration. This procedure reestablished the function, the aesthetic appearance and the self-esteem of this patient.

**Keywords:** traumatic injury, enamel hypoplasia, permanent teeth, aesthetic treatment

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## Introduction

Orofacial trauma is a serious dental and general health problem that may have medical, esthetic and psychological consequences for children and their parents.[1,2] Owing to their exposed position in the dental arch, the upper central incisors are the most commonly teeth affected by traumatic injury in primary and permanent dentition. With a statistical gap in incidence, they are followed by traumatic injuries of the upper and lower lateral incisors and upper canines.[3,4] Sequelae in the permanent dentition after trauma to primary dentition are usually related to intrusive injury.[4,5] The type and severity of traumatic injuries are related to predisposing factors, such as child's age, proximity of primary teeth and permanent germ, stage of root formation or resorption of primary teeth, permanent teeth root formation, root inclination of primary teeth when trauma occurred, treatment conduct and deciduous tooth repair, among others.[1–7] Primary tooth intrusion may result in a variety of pathologic alterations to permanent teeth, including hypoplasia, crown dilaceration, root angulation or dilaceration, partial or complete arrest of root formation, sequestration of the permanent tooth germ, and disturbances in eruption. Of these, hypoplasia (including enamel discoloration and/or enamel defects) is the most common sequel.[8] The present study relates a clinical case of an aesthetic treatment in permanent teeth with localized crown malformation, enamel hypoplasia as a result of traumatic injury in the primary central incisors.

## Case report

An 8year and 6month old male patient presented to the Ribeirão Preto School of Dentistry complaining about the upper incisors aesthetics, which were altered in shape and color. Patient's dental history was reported by his father and revealed an intrusive luxation of his primary incisors teeth as a result of a fall at the age of 18 months. The father doesn't know about the importance of clinical and radiographic monitoring until complete eruption of permanent teeth. Following clinical examination a diagnosis was made of enamel hypoplasia in both central incisors, presenting yellow-brownish discolorations in the middle and incisal third (Figure 1). Radiographic examination confirmed an immature apex, no root fracture or dilacerations and no periapical pathological condition were observed. The treatment plan was aesthetics restorations with resin composite without substrate wear (Figure 2). After absolute isolation with rubber dam, the teeth were clean and the acid etching was performed (37% phosphoric acid) for 15seconds in all affected surface on enamel near of lesion (Figure 3). After washing and removal of the water excess, it was applied 2consecutive coats of adhesive system (Single bond-3M ESPE Dental Products, St Paul, MN, USA) for 15seconds with gentle agitation using a fully saturated applicator and gently air thin for 5seconds to evaporate solvente, light-cured for 10seconds. The first layer was employed opaque resin (Opallis Opaque Pearl-FGM Produtos Odontológicos, Joinville, SC, Brazil) (Figure 4), which was light-cured for 40 seconds. In sequence, a nanohybrid composite was inserted in increments in the angles and in the proximal surfaces (Opallis - FGM Produtos Odontológicos, Joinville, SC, Brazil) using two different shades (B1 and B2) (Figure 5) and photopolymerizing each layer for 20seconds. Occlusal and excursive movements were adjustment immediately after restoration using carbon paper and high-speed multi-laminated drills. After 48hours, the finishing was made with abrasives disks (Sof-Lex™ Contoiring and Polishing Discs-3M ESPE Dental Products, St Paul, MN, USA) and polished with felt disc and diamond paste (KG Sorensen, São Paulo, SP, Brazil) (Figure 6).

**Figure 1&2** Enamel hypoplasia in the middle and incisal third.

**Figure 3** After rubber dam, without wear substrate.

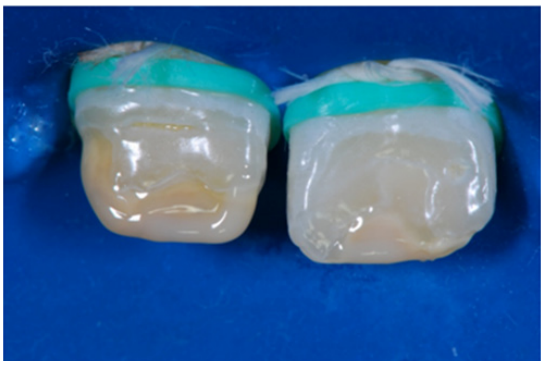

**Figure 4** An opaque resin composite was used to mask color alteration and hypoplasticlesion.

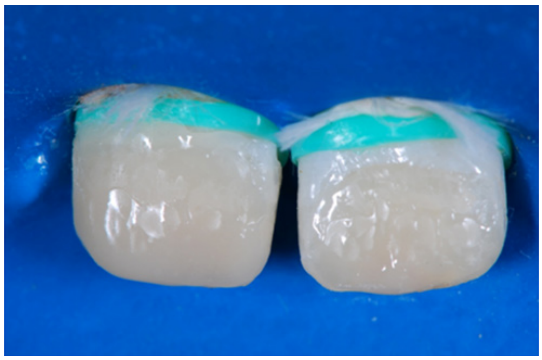

**Figure 5** A nanohybrid resin composite was inserted in increments in the angles and in the proximal surfaces to reconstruction of crown.

**Figure 6** The final restoration, after occlusal adjustment, contour and polishing.

## Discussion

Sequelae for permanent dentition after a trauma to primary dentition are usually related to intrusive injuries.[4-9] The impact by a force in an axial direction often results in displacement of the tooth within the socket.[2] Intrusive injury to primary dentition often results in anomalous development of the permanent teeth,[4-9] with a frequency of between 18 and 69%.[5–8] Many sequelaes can be found in the coronal region, such as structural alterations associated with enamel hypoplasia, crown dilaceration and white, yellow/brown discoloration,[4-10] such was observed in the present clinical case. Developmental disturbances of permanent teeth involving the crown have been reported to occur more frequently than those involving the roots or eruption patterns.[10] This finding may be attributed to the close relationship between the primary tooth root and the permanent tooth crown and the fact that the majority of traumatic injuries occur between ages 1 and 3, during the developmental stage of the permanent crown.[10] In the present case, shape and color alterations were observed in the crown only and the trauma occurred when the patient was 18 months, in this time the germ of the permanent successor was in the initial stages of odontogenesis. Probably the trauma promoted ameloblasts destruction in the active enamel epithelium,[8] crown dilacerations and enamel hypoplasia. Studies evaluated the effect of luxation injuries to primary teeth on the successor permanent teeth in children assisted at emergency centers and observed that hypoplasia was the disturbance most detected through radiographic analysis.[4-11] Depending on the degree of severity of these anomalies, various protocols of treatment

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may be performed, including whitening, microabrasion, aesthetic conservative restorations and prosthetic rehabilitation. In the present case, restoration of the incisal and middle third of central incisors was necessary. An opaque resin nanohybrid composite was used to mask color alteration and hypoplastic lesion. Resin composite was also use to the reconstruction of crown dilacerations.

## Conclusion

This treatment was possible due to precise diagnostic process and an effective and efficient treatment which reestablished the function, aesthetic appearance and the self-esteem of patient.

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## Conflicts of interest

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