

Crown Dilaceration with Discoloration and Hypoplasia of Maxillary Permanent Central Incisors After Trauma to the Primary Dentition: Case Report

Primer Dentisyonda Geçirilmiş Travma Sonucu Maksiller Daimi Santral Dişlerde Renklenme ve Hipoplazi ile Birlikte Görülen Kron Dilaserasyonu

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ABSTRACT Traumatic dental injuries are very frequent cases during childhood and adolescence. In primary dentition if the injury occurs then its effects will be seen on the developing permanent tooth germ by delayed eruption, impacted or enamel hypoplasias. In this case report it is presented the trauma to the primary teeth and its effects to the permanent dentition. A 13-year-old boy was referred to the department of Oral Diagnosis and Radiology for a routine examination. It was detected crown dilaceration with discoloration of the enamel and hypoplasia of the upper right and left permanent central incisors by a result of the intrusion of the primary maxillary anterior teeth at the age of 1.5 years due to fall. After clinical examination and radiographic evaluation of the patient who complained about the appearance of his anterior teeth, it was seen the both dilacerated teeth had fully erupted and responded positively to electric pulp testing. The dilacerated teeth were improved with esthetic composite restoration and the palatal inclination was vertically corrected according to normal anatomical forms.

Key Words: Injuries; dental enamel hypoplasia; tooth deciduous

ÖZET Travmatik dental yaralanmalar özellikle çocukluk ve adolesan dönemde sıklıkla karşımıza çıkan bir durumdur. Süt dişlenme döneminde meydana gelen yaralanmanın daimi dişler üzerinde diş sürmesinde gecikme, gömülü kalma ve mine hipoplazileri gibi etkileri vardır. Bu olgu raporunda süt dişinin maruz kaldığı travma ile bu travmanın daimi dişlenme üzerindeki etkisi bildirilmiştir. Rutin ağız, diş, çene muayenesi için Oral Diagnoz ve Radyoloji Anabilim dalına başvuran 13 yaşındaki erkek hastada, 1,5 yaşında düşme sonucu maksiller süt anterior dişlerde intrüzyon sebebiyle ortaya çıkan mine renklenmesi ve hipoplazisi ile birlikte üst sağ ve sol daimi santral dişlerde kron dilaserasyonu tespit edildi. Ön dişlerinin görünümünden şikayetçi olan hastanın klinik muayenesi ve radyografik değerlendirmesi sonrası her iki dilasere dişinin tamamen sürmüştüğü ve elektrikli pulpa testine pozitif yanıt verdiği görüldü. Dilasere dişler estetik kompozit restorasyon ile tamir edildi ve palatal eğimi normal anatomik forma uyumlu bir şekilde düzeltilti.

Anahtar Kelimeler: Yaralanmalar; dental mine hipoplazisi; geçici diş

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Traumatic dental injuries occur frequently during childhood, and epidemiological studies show that the prevalence of injuries to primary teeth range from 6.5% to 71.4%.¹⁻⁶ Trauma to primary teeth can potentially damage their permanent successors. The type and the severity of anomaly depend on the developmental stage of the permanent teeth and the intensity and type of trauma.

Intrusion and avulsion are the most seen injuries that affect the developing tooth crown in early aged children. Developmental anomalies may be manifested as white or yellowish-brown discolorations of the enamel, localized enamel hypoplasia, and crown dilacerations.⁷⁻¹³ In addition to crown disturbances, trauma to the primary dentition may also affect the root region or the entire permanent tooth germ, and many sequelae can result from this, such as root dilaceration, root duplication, partial or complete arrest of root formation, odontoma-like malformations, and eruption disturbances.^{7,8,11-15}

Rates of developmental anomalies of permanent teeth due to primary tooth trauma between 12% and 53.6% have been reported.^{7,10,16,17}

The aim of this article is to report a crown dilaceration with discoloration and hypoplasia of the enamel of the permanent right and left maxillary central incisors in a 13-year-old boy with a history of trauma at an early age, in which the primary teeth were extracted immediately after the accident.

CASE REPORT

A 13-year-old boy was referred to the department of Oral Diagnosis and Radiology for a routine dental examination. He complained about the appearance of his right and left maxillary central incisors. His medical history was not contributory. His mother provided a history of trauma at the age of 1.5 years due to fall, which resulted in partial intrusion of his deciduous maxillary central incisors. The intruded teeth were extracted. Intraoral examination revealed horizontal enamel hypoplasia in the middle of third on the both central incisors with a localized brownish discoloration on the left central incisor and a white discoloration on the right central incisor. Moreover, there was crown dilaceration that was much clearer in the left central incisor, and both teeth were bent palatally at the mid-linear level of the crowns (Figure 1). Caries were detected on the palatal surface of the left maxillary central incisor; however, both teeth were vital (positive responses to electric pulp testing). Localized gin-



FIGURE 1: Intraoral view showing totally erupted maxillary right and left central incisors. Note: Horizontal enamel hypoplasia in the middle third of both central incisors with a localized brownish discoloration on the left central incisor and a white discoloration on the right central incisor.

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gival overgrowth and bleeding upon probing were noted on the labial gingiva in the maxillary anterior region. Intraoral periapical radiographs of the maxillary central incisors showed crown dilacerations of the right and left maxillary incisors. Both central incisors with fully formed root apices had no periapical pathology or root fractures that were visible radiographically (Figure 2).

Under local anesthesia, the dilacerated crowns of the incisors were prepared and restored with acid etching, bonding agent (Prime&Bond NT, Dentsply, De Trey, Konstanz, Germany), and a resin composite (Clearfil Majesty Esthetic, Kuraray Co., Ltd, Osaka, Japan) according to the anatomic form (Figure 3). Periodic follow-up appointments were scheduled for periodontal treatment and to monitor the restored teeth.

DISCUSSION

Developmental anomalies of the permanent teeth involving the crown are reported to occur more frequently than developmental root anomalies, and the most serious crown malformations occur in children between the ages of 0 and 3 years at the time of injury.^{7-9,12-18} This is the developmental stage of the permanent crown, and there is a close relationship between the primary tooth root and the permanent tooth crown.^{7,9,10,16-18} Because



FIGURE 2: Radiographic appearance of the teeth.



FIGURE 3: Intraoral view of the patient after the restoration of the central incisors with a resin composite.

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maxillary primary incisors are more prone to injury, the permanent maxillary central incisors are the most commonly affected teeth.^{6,7,9,10,15-20} In the present case with a history of trauma at an early age, developmental anomalies were observed in the crowns of the permanent central incisors only.

Intrusive or extrusive luxation of the primary teeth results in the highest risk of crown dilaceration and discoloration of the enamel and/or enamel hypoplasia of the permanent dentition.^{7,12,13,15,17,21} Jacoma and Campos, Christophersen et al., Altun et al., and Assunção et al. reported that the most frequent sequelae after traumatic injury to the primary teeth were discoloration of the enamel and/or enamel hypoplasia in the permanent teeth.^{7,10,16,17} The traumatic displacement of the roots of primary teeth may alter the secretory phase of ameloblasts and cause hypoplasia of the enamel. Turgut et al., Christophersen et al., and Altun et al. reported that if breakdown products from bleeding spread into an area where enamel formation is still taking place, the result will be a yellow-brown discoloration.^{9,10,19}

Crown dilacerations occur due to traumatic non-axial displacement of the already formed hard tissue portion of the tooth in relationship with the developing soft tissue portion.^{18,20}

Assunção et al. reported that 9% and Andreasen and Ravn reported that 3% of the injuries to the primary teeth result in this type of malformation.^{17,22} However, Christophersen et al. did not report any crown dilacerations in their study, although this may be attributed to the older age of the children at the time of injury in this study.¹⁰

In the present case, the intrusive-type injury to the deciduous incisors at the age of 1,5 years was a possible etiological factor, which caused crown dilaceration with discoloration of the enamel and enamel hypoplasia of the upper permanent central incisors. In cases similar to the one presented here, crown dilaceration alone was not seen, but rather was accompanied by discoloration and hypoplasia of the enamel.^{9,13,15,18,19,23} Since the developmental formation of the permanent incisors is still ongoing at the ages of 0-3 years, the displacement of a primary tooth root occurring as the result of intrusion affects both the secretory phase of the ameloblasts, which cause hypoplasia, and the deviation in the mineralized tissue, which results in dilacerations as a consequence.

Çalışkan and Tekin reported that a crown dilacerated tooth is at risk of developing pulp necrosis accompanied by periapical inflammation with no caries evident.¹³ Altun et al. also reported that trauma to the primary teeth can lead to calcified tissue that resembles pulp stones in the permanent successor teeth.¹⁹ However, in our case, clinical and radiographic examinations did not show any pulp stones or periapical pathology in either of the crown-dilacerated central incisors, except for dental caries in the left central incisor.

The dilacerated right and left maxillary central incisors reported here had fully erupted. Treatment options for crown dilacerations associated with an erupted tooth include preparation and restoration of the crown with resin composite, improving the esthetics with a permanent porcelain

jacket crown, or using a prosthesis or orthodontic space closure after an extraction.^{9,11,13-15,18,19,23} In this case, the caries section of the dilacerated tooth was removed. The dilacerated teeth were improved with an esthetic composite restoration, and the palatal inclination was vertically corrected according to normal anatomical forms.

In conclusion, intrusive luxation of the primary teeth in patients between the ages of 1 and 3 years results in the highest risk of crown dilaceration and discoloration of the enamel and/or enamel hypoplasia of the permanent dentition. Permanent maxillary central incisors are the most commonly affected teeth, and this type of developmental disturbance leads to esthetic problems during adult life. To avoid the unwilling prognosis after treatment such as pulp necrosis, periodic follow-up appointments must be scheduled.

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