



## Management of Hidden Crown Dilaceration and Hypoplasia in Newly Erupted Permanent Incisors- Early Intervention and Prevention

Dhindsa Abhishek, Garg Shalini\*, Singla Shilpy, Singh Gundeep and Loomba Ashish

Department of Pediatric and Preventive Dentistry, Maharishi Markandeshwar College of Dental Sciences and Research, Maharishi Markandeshwar University, Mullana (Ambala), Haryana, India

### Abstract

Stage of succedaneous tooth's development at the time of traumatic injury and/or treatment of carious primary tooth can result in disruption of normal enamel formation and other severe form of injuries to developing tooth bud, resulting in enamel opacities, hypoplasia, dilacerations and even agenesis. This paper describes two rare cases in which traumatic injury to primary incisors resulted in irreversible histodifferentiation and morphodifferentiation changes in the succedaneous tooth germs. Permanent mandibular and maxillary incisors erupted with hypoplasia/dilacerations i.e., anomalies in shape, form and size as sequel to this trauma. Early intervention was considered in both the cases with minimum invasive approach regarding preventive, restorative and esthetic techniques. This approach of treatment established form, function, appearance and hence self-esteem of the children.

**Keywords:** Crown dilaceration; Hypoplasia; Anomalies early intervention; Self esteem

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### Introduction

**\*Correspondence:**  
Shalini Garg, Department of Pediatric and Preventive Dentistry, Maharishi Markandeshwar College of Dental Sciences and Research, Maharishi Markandeshwar University, Mullana (Ambala), Haryana, India, Tel: +91-9215668621;

E-mail: shaloosandeep@gmail.com

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Dilaceration is a deviation or bend in the linear relationship of a crown of a tooth to its root [1-3]. The condition is thought to be due to trauma occurring when the tooth is forming, which alters the position of the calcified portion of the tooth so that the remainder of the tooth is formed at an angle [4]. Trauma to the primary teeth can result in a wide range of disturbances to the succedaneous permanent teeth. The permanent incisors may be affected by intrusion, avulsion or gross displacement of primary incisors. This can range from a simple white or yellow brown discoloration of crown, crown duplication, root dilacerations, root duplication, odontome like malformation, partial or complete arrest of root formation, sequestration of the permanent tooth germ or disturbances in the eruption of permanent teeth. The type and severity of the disturbance is dependent upon stage of development of permanent teeth (age at the time of injury), relationship of permanent tooth to the roots of primary tooth and direction and degree of the force. Also unfortunately even without evidence of caries these teeth with pathologies may later develop pulpal necrosis followed by apical periodontitis and chronic abscess [5].

Dilaceration can be seen in both the permanent and deciduous dentitions, but the incidence in the latter is very low [6-10]. Bilaterally occurring dilacerations might be seen in many patients, but bilateral dilacerations in both the maxilla and mandible of the same person is rarely found. There is no sex predilection for dilacerations of the teeth

Dilaceration of root is more common than that of a crown. Permanent maxillary central incisors are the most commonly dilacerated teeth. They are followed by mandibular central and lateral incisors. Teeth with dilacerated crown may erupt normally or in facial or lingual version. Management of newly erupted tooth with developmental defects is critical for longevity of tooth and cost effectiveness. So, treatment planning of the dilacerated tooth has to be non-invasive and preventive. Immediate sealing of the defect is required keeping in mind complex endodontic system of these teeth. Further, cosmetic repair of unaesthetic newly erupted permanent teeth is critical for child's psychological wellbeing. An updated diagnosis and treatment of two rare and unusual cases of severe crown dilacerations of mandibular and maxillary central incisors with hypoplasia is presented here.



**Figure 1:** Preoperative clinical photograph showing hypoplastic spot (labially) in 31.



**Figure 2:** Preoperative intra oral periapical radiograph showing dilacerations of crown in the middle third in 31.

## Case Presentation

### Case 1

A 10-year-old boy reported to the outpatient department with the chief complaint of occasional pain and history of brown spot in lower front tooth, since 4-5 months. Pain was mild in nature and used to get relieved by it. Clinical examination revealed round localized hypoplastic brownish spot with definite margins (size: 1 mm × 1 mm approximately) in relation to 31. Patient gave history that this spot was present since 31 erupted. Also, this localized hypoplastic lesion was in continuation with a fine enamel fold extending labio-lingually and proximally in the middle third of the crown. A slight twist was evident in tooth along its long axis and in accordance with this fine enamel fold showing a sort of twist line. Further the tooth was out of alignment from normal arch form, showing ectopic eruption (Figure 1). Tooth was responding normal to hot and cold tests and was non tender to percussion. There was history of trauma to the primary mandibular incisors at the age of two and half years and the medical history of the patient was non-contributory. This history coincides with injury to permanent tooth bud of this tooth at crown formation stage 'C' of tooth development i.e. crown formation approaches at its half according to Demirjian's classification.

**Radiographic examination:** Radiographic picture showed discontinuation of normal crown outline form, abnormal radioopacity at the junction of middle and cervical third in relation to 31. A definite twist could be appreciated in crown structure at this level, clinically also. Crown part showed complex relation and position of pulp tissue as compared to adjacent normal tooth. Abnormal radiolucent shadow due to hypoplasia appeared continuous with radiolucent pulp space. This showed that tooth was at risk, regarding pulpal involvement



**Figure 3:** Showing dilaceration in the middle third (lingually) in 31.



**Figure 4:** Showing preventive and esthetic restoration in 31.

(Figure 2).

**Treatment:** On the basis of clinical and radiographic findings, a final diagnosis of crown dilacerations with localized enamel hypoplasia with respect to 31 was made (Figure 3). Treatment part consisted of recontouring of the lingual surface of the tooth to make tooth area self-cleansing. Hypoplastic area was excavated and total etch light cure composite was done with the motive of preventive and esthetic approach to achieve normal psychological wellbeing of the patient. Figure 4A and 4B shows minimally invasive restoration of labial and lingual defect.

### Case 2

A 10-year-old boy reported to the outpatient department with the chief complaint of newly half erupted yellow upper front tooth. Clinical examination revealed that tooth was patchy, discolored and gave moth eaten appearance (Figure 5). Uncomplicated crown fracture of distal angle of 21 was clinically evident. Clinical crown appeared to have twisted pointing medially to long axis, starting from incisal edge to junction of cervical and middle third (Figure 6) Heat and cold test gave positive response. Tooth was non tender to percussion. Clinical findings coincided with the history of trauma to primary incisors with complete intrusion of 61 at the age of 4-5 years.

**Radiographic examination:** Intraoral periapical radiograph revealed dilacerations of incisal half of crown with respect to 21 with evident discontinuous normal outline form of crown. Pulp canal appeared partially calcified in comparison to 11. Dilaceration was evident in the middle third of the crown and no periapical pathology was seen. Level of dilacerations showed proximity of pulp chamber to incisal level and with the risk of definite involvement of the pulp with time (Figure 7).

**Treatment:** Excavation of caries was done with the help of spoon excavator. Minimal crown preparation was done for restoration. After excavation dentin was covered with light cure calcium hydroxide liner to protect the underlying pulp, followed by lining by GIC and



**Figure 5:** Preoperative intra oral periapical radiograph showing dilacerations of crown in the middle third in 21.



**Figure 6:** Showing dilaceration in the middle third (labially) in 21.



**Figure 7:** Showing preventive and esthetic restoration in 21.

esthetic restoration was done using light cure composite using total etch technique (Figure 7).

## Discussion

Primary tooth trauma is common in growing children. Trauma to primary teeth is often poorly managed because of difficult management, lack of awareness regarding importance of primary teeth in India i.e. milk teeth are not permanent and will be replaced by their corresponding successors. Parents usually don't report and go for long term follow up in case of primary tooth injuries. In Traumatized primary tooth resorption, periapical infection and lack of emergency treatment plays major role in developmental disturbances of underlying succedaneous tooth. Our case reports were results of same concept management. When trauma to root or crown occurs during odontogenesis, it results in the dilacerations, hypoplasia, and disturbances in shapes, sizes and form. Light stated that clinical appearance of incisors with dilacerations of crown will depend on the stage at which the injury to the developing tooth bud has occurred [11]. Crown dilacerations are usually due to intrusion or avulsion of their primary predecessors as seen in our case 2 and 1 respectively. If the injury occurs during second or third year of

life only the portion of the crown of the permanent incisors will be tipped but if the injury occurs in fourth or fifth year the entire crown might be involved as in our cases. Pathology of crown dilacerations can be explained by theory of displacement of enamel epithelium and mineralized portion of the tooth in relation to dental papilla and cervical loop [12]. When trauma occurs the previously calcified coronal portion is moved bodily within the bone in response to injury but still leaving in their original place the more apically situated soft tissue elements undergoing calcification. If this formative tissue manages to survive the incident it will continue to develop in its original alignment so dilacerations between it and the previously calcified part of the tooth occurs. Timely diagnosis and preventive management plays crucial role in saving the tooth, as pulpal necrosis and periapical inflammation in these teeth without any decay may be a common feature after they erupt in the oral cavity. So, the restoration therapy should be instituted as soon as dilaceration area erupts to a level free of gingiva. Diagnosis and management in our reported cases protected the teeth from pulp involvement. In case 1 diagnosis of crown dilacerations was a challenge as one being mandibular incisors crown dilacerations is very rare and secondly severe dilacerations of crown was hidden giving no clinical appearance except a brown spot and fine enamel fold. In case 2, hypoplasia, dilacerations and pathology of the crown was more severe. Patient was unaware of the severity of the problem and came with chief complaint of bad looking tooth which could have been easily pulpally involved as it was already fractured at distal angle. The tooth was treated by vital pulp therapy which is minimally invasive and cost effective.

Present cases show the need of radiographic examination of all permanent teeth which have any developmental pathology i.e. even a small hypoplastic spot as in our cases. These serious injuries as crown dilacerations as sequelae of trauma to primary incisors ultimately affects longevity of permanent teeth i.e. its life span may be short if it requires root canal treatment in future which is not possible or extremely difficult in such cases. Early and accurate diagnosis of crown dilacerations as in our cases and easy esthetic management with acid etch composite technique prevented further complications of pulpal involvement, impossible or difficult root canal treatment or may be loss of this permanent tooth. This early approach was invaluable for child's psychological wellbeing in present cases.

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