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Aesthetic Management of Coronal Dilacerations with Enamel Hypoplasia of Permanent Maxillary Central Incisors:

Nehal Amir, Muqadus Hayat

ABSTRACT

Dilaceration is a peculiar developmental dental anomaly. It is associated with traumatic events of deciduous teeth affecting the permanent tooth buds. It is chiefly a precipitous change in the axial inclination between the crown and the root of a tooth. Dilacerated crown, a rare clinical presentation, is a result of the non-axial displacement of pre-formed hard tissues of a developing crown at an angle to its longitudinal axis. It conspicuously impacts the appearance of patient. Enamel hypoplasia is primarily due to the trauma or infection of primary predecessor tooth resulting in a quantitative defect in enamel of permanent successors. Occasionally, both conditions; dilacerated crown and enamel hypoplasia can occur concomitantly producing many unpropitious outcomes. This particular case is about a 14-year-old boy presenting to the Department of Operative dentistry and Endodontics for the esthetic management of anomalous maxillary central incisors. These anomalous teeth were conservatively managed using direct composite veneers.

Keywords: Dental anomaly, Dilaceration, Enamel hypoplasia

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INTRODUCTION:

Dental anomalies are characteristically aberrant morphological or histological alterations in the normal shape, structure, form or number of teeth. They can be developmental or acquired. Developmental anomalies are localized or generalized inherited defects during tooth formation. Dilaceration is a distinctive localized developmental dental anomaly characterized by abnormal deviation in the normal angulation of coronal or radicular portion of the tooth. [1]

Coronal Dilaceration is an abrupt, non-axial derangement in the developing crown in response to a traumatic episode along its longitudinal axis. The etiology of dilaceration can be categorized into traumatic or ectopic tooth bud development. The cause is chiefly accredited to dental trauma in primary predecessors affecting permanent tooth germs but there is a vast array of clinical scenarios in which no traumatic cause could be designated as an etiological factor. A possible explanation could be that majority of pediatric traumatic events remain unrecognized or merely neglected by the guardians. [2]

Subsequently, another commonly encountered localized, inherited dental defect is Enamel hypoplasia. It is primarily linked to trauma or infection of primary predecessor tooth resulting in a quantitative defect in enamel of permanent successors. Occasionally, both coronal dilaceration and hypoplastic enamel defects can occur concomitantly producing many unpropitious outcomes. [3] The management of these developmental defects necessitate a strategic multidisciplinary approach for patient rehabilitation. A tailored treatment plan has to be devised encompassing restorative, endodontic, orthodontic and surgical domains providing high-quality dental care to patients. This not only ameliorate the symptoms but also enhance the quality of life. [4] The aim of this case report is to shed light on the prompt diagnosis and timely intervention of inherited dental defects. Such anomalies, if managed rationally, can drastically upgrade the final treatment outcomes.

Case Report

A 14-year-old male patient, resident of Islamabad, reported to the Outpatient Department of Operative Dentistry and Endodontics, School of Dentistry, Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad on 25th July, 2024 with the complaint of deformed upper front teeth and misaligned dentition. A comprehensive medico-dental history was documented scrupulously. The patient, escorted by his father, couldn't recall any significant history of childhood illness or dental trauma. Moreover, they reported that the primary dentition was well-formed but as soon as the permanent front two teeth erupted, they were disfigured. They had also previously consulted many dental practitioners concerning their dental issue. This esthetic concern emanated considerable psycho-social impact on the patient's mental well-being and self-confidence.

Nehal Amir *(Corresponding Author)*
Resident, Department of Operative Dentistry & Endodontics
Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad
Email: dr.nehal511@yahoo.com

Muqadus Hayat
House Officer, Department of General Dentistry
Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad
Email: muqadushayat2000@gmail.com

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On clinical examination, the extra-oral findings were non-contributory. On intra-oral examination, the maxillary right and left central incisors were affected. The coronal portion of the tooth was displaced palatally. The enamel was hypoplastic in the middle-incisal third region of the crown. On palatal aspect of these anomalous teeth, there was a deep groove depicting carious lesion along the junction of the dilacerated and non-dilacerated coronal part of the tooth. The teeth were in Angle Class II malocclusion. *Figure 1* depicts the clinical presentation of these malformed maxillary central incisors. The examination was supplemented by periapical radiography to investigate for any radicular anomaly (*Figure 2*). After cumulating all significant aspects, the case was diagnosed as Crown Dilaceration with Localized Enamel Hypoplasia. Dental trauma, despite being a very common cause, could not be specified as the etiological factor for this case presentation since, the patient and the guardian didn't recollect any episode of childhood accident.

The treatment plan was devised. The case was primarily managed in three stages. The first stage, *Reassurance and Counselling*, was the pivot of management in this case. The patient and the guardian were meticulously briefed about the dental issue, its possible causative factors, the cos and pros of dental intervention, and the anticipated treatment outcomes. The second stage, *Restorative phase*, was fundamentally an interim esthetic intervention for the two maxillary central incisors till the patient reaches adulthood, after which the case would be subjected to a definitive

Figure 1. Clinical representation of dilacerated crowns with localized hypoplastic enamel.

(A) Anterior intra-oral view: The maxillary right and left central incisors are deformed (dilacerated crowns and hypoplastic enamel defect involving middle-incisal region of teeth)

(B) Maxillary Occlusal view: The maxillary central incisors are displaced (bending) palatally. Carious lesions involving the palatal aspect of these teeth.

(C) **Right Buccal view:** Clinical presentation of palatal curvature of the crown of right maxillary central incisor. Hypoplastic enamel defect is involving middle-incisal third region of the tooth.

(D) **Left Buccal view:** The palatally curved coronal portion of left maxillary central incisor along with its hypoplastic enamel surface.

Figure 2. Intra-oral Periapical Radiographic representation of dilacerated crowns of maxillary right and left central incisors

Figure 3. Post-operative clinical depiction of the restored maxillary central incisors. The anomalous maxillary central incisors were conservatively managed using direct composite veneers.

restorative plan. The Light cure direct composite veneers were planned as a preferable treatment option in this case. This was a conservative and practicable option that would address the esthetic complaint appreciably. The third stage, *Fixed Orthodontic treatment phase*, was planned to rectify the malocclusion. Afterwards, an informed consent form was signed by the patient with due permission granted by the guardian.

Succeeding the pre-treatment planning phase, the restorative intervention was performed under rubber dam isolation. After the concerned teeth were prepared, an etch-and-rinse adhesive strategy was accomplished for the esthetic treatment. Acid etching was performed using Phosphoric acid 35% (Etchant gel S Coltene, Switzerland) followed by rinsing and air drying of the affected region of the teeth. Subsequently, the etched surface was vigorously coated with adhesive (One Coat Bond SL Coltene, Switzerland) for 20 seconds. This was followed by another application for 20 seconds. Afterwards, the adhesive coating was light-cured using an LED curing light (Woodpecker DTE LUX E Plus, Woodpecker, China) for 40 seconds. Eventually, the affected teeth were restored with direct composite veneers using light cure composite resin (Brilliant NG Universal Nano Composite Coltene, Switzerland) followed by light curing for 40 seconds. The final restoration was polished using a Jiffy Original Composite System (Ultradent, USA). *Figure 3* represents the post-operative clinical presentation of the restored teeth. The patient was eminently satisfied by the final treatment outcome. Post-restorative instructions were given and the patient was referred to the Department of Orthodontics for the management of maloccluded teeth.

DISCUSSION:

Dental traumatology is an indispensable predicament in oral public health. Being an emergency situation, it mandates expeditious intervention to avoid any inauspicious consequences. Besides medico-dental aspects of traumatic events, it has a noteworthy psychological impact. Owing to the contiguity of permanent tooth bud with the apex of the deciduous tooth, any infection or trauma to the deciduous teeth can have a crucial impact on the eruption of permanent dentition.[5] The developmental malformations in the permanent successors due to dento-alveolar trauma or periapical infection associated with the deciduous predecessor teeth encompasses from yellowish-brown discoloration to hypoplastic enamel defects, coronal dilaceration, radicular duplication or dilaceration, restricted or absolute arrest of root development, odontoma-like deformations, sequestration of the permanent tooth bud, and disruption in the eruption of successor teeth.[6] In this particular case report, the patient presented with localized hypoplastic enamel defect in association with a dilacerated crown. The coronal portion of the teeth were palatally displaced where a plaque stagnation site was established that resulted in the development of a carious lesion palatally. These anomalous defects were conservatively managed in accordance with the fundamentals of minimal intervention adhesive dentistry. T.S. Mellara et al [7] had reported similar cases of dilacerated teeth that were conservatively restored utilizing direct composite resin to reclaim aesthetics and functionality of patients. An analogous case was reported by Sodhi JS. et al [8] where localized enamel hypoplasia was co-existent on a dilacerated crown. However, the coronal displacement was in the labial direction in opposition to the current case where the crown was displaced palatally.

Developmental dental malformations, frequently witnessed in the maxillary arch, have a variable presentation, with hypoplastic enamel defects being the most commonly encountered while coronal or radicular dilaceration being an infrequent clinical finding.[5, 9, 10] Dento-alveolar trauma, despite being a widespread cause of localized dental anomalies, in this specific case, the patient and the guardian could not recollect any history of childhood accidents indicating an idiopathic etiology. However, Topouzelis et al. [2] have significantly highlighted the fact that many episodes of dental trauma are either forgotten or unobserved by parents. Nonetheless, Walia PS. et al.[11] have clearly mentioned in their study that trauma to the predecessor tooth is not the absolute etiological factor for dilaceration and idiopathic dental deformations could be a causative factor in case of unclear evidence of a traumatic event. Regardless of the etiology behind dental anomalies, these malformations necessitate early detection, well-planned intervention, and periodic follow-ups to provide an aesthetic, functional, and psychological benefit to the patients.

CONCLUSION:

Developmental dental malformations are frequently encountered findings in clinical settings. They constitute significant diagnostic, prognostic, and interventional challenges. Coronal dilaceration, despite being a rare finding, can produce massive aesthetic and psychological influence and hence require prompt intervention. These developmental defects, if not managed timely, can result in loss of tooth structure, aesthetic problems, endodontic or periodontal

implications, and functional disability in patients. Henceforth, it is extremely crucial to treat these cases on a priority basis with a multidisciplinary approach to provide prodigious dental care to patients.

Authors Contribution:
Nehal Amir: Conception, Principal Investigator (clinician), Literature Review, Manuscript writing and Critical Revision
Muqadus Hayat: Contributed to assistance during the treatment, contributed to manuscript writing and editing

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