CROWN DILACERATION IN MANDIBULAR PERMANENT INCISOR - A CASE REPORT

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ABSTRACT

Crown dilaceration in permanent teeth is a rare malformation representing 3% of the total dento-alveolar injuries. It presents as a sharp bend or displacement of the crown from the long axis of the tooth with compromised esthetic and function. Treatment options may include endodontic, restorative, orthodontic, surgical or combination of these. This case report describes the management of crown dilaceration in mandibular incisor treated with nonsurgical endodontic treatment and direct composite restoration.

Key words: *crown dilacerations, dental trauma*

INTRODUCTION

Traumatic injuries of deciduous teeth being quite common in young children can indirectly influence the development of the permanent teeth.[1,2] The critical age group in which these injuries can potentially produce devastating effects in the permanent teeth is in the range of two to five years. The factors that determine the effect of injury in the permanent teeth include age of the patient, developmental stage of the tooth germ, and anatomic proximity of the primary tooth to the permanent tooth germ and the magnitude and direction of force. As a result various dental malformations including sequestration of permanent tooth germ, partial or complete arrest of root formation, root dilacerations, crown dilacerations, developmental disturbances of enamel and eruption problems can occur in the permanent teeth.[3] Among these, crown dilaceration is considered to be a rare occurring. According to previous studies, only 3% of all traumatic injuries to deciduous teeth resulted in crown dilaceration in the succeeding teeth.[4] Tomes in 1848 coined this word for the first time. It is documented that maxillary incisors are the most vulnerable teeth followed by mandibular incisors.[5]

Dilaceration can cause significant aesthetic and functional problems to the patient and can offer considerable challenges to endodontist and restorative dentist.[6] This case report describes the endodontic management of a rare condition of mandibular central incisor presented with crown dilaceration.

CASE REPORT

A 15-year-old boy, referred to the Endodontic Department of 28 MDC CMH, Lahore by orthodontist for treatment of a malformed mandibular left incisor (tooth 31). The patient complained of poor dental esthetics, tongue irritation and difficulty in incising and cleaning with the affected tooth. The child was healthy and had no history of systemic disease. Dental history revealed trauma to the anterior mandible at 3 years of age due to fall from a bicycle. As a result the mandibular primary central incisors had intruded which were extracted afterwards. Parents were not informed about the possible occurrence of sequel to the successor permanent dentition. On eruption they noted that one of the permanent successors was malformed and discolored.

Clinical examination revealed a fully erupted mandibular left central incisor (tooth 31) with dilacerated crown (Fig 1). The coronal portion of the tooth was bent labially at the cervical region and was placed almost at right angle to the long axis of the root. The crown showed yellowish discoloration on labial surface at junction of middle and gingival third. No carious lesion was present. Patient presented with generalized mal alignment of teeth with Class I occlusion and mild crowding and midline diastema (maxillary arch). Periodontal examination revealed healthy gingival tissue with less than 3mm of probing depth. The tooth was not tender on palpation and percussion. Detailed Investigations were carried out for the diagnosis and appropriate treatment plan which included OPG, Lateral cephalogram, pulp vitality test, digital periapical radiograph of 31(Fig 2). Pulp Vitality tests were performed including electric pulp testing, cold test (Ethyl chloride) and heat test (using heated Gutta percha stick); the tooth respond-

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ed negatively. Radiographic investigations revealed that tooth 31 was foreshortened coronally and had large periapical radiolucency with loss of lamina dura in the apical third of the root. Based on clinical and radiographic findings, crown dilaceration with enamel hypocalcification and necrotic pulp with asymptomatic apical periodontitis was diagnosed.

Treatment plan devised was to carry out root canal treatment followed by an interim direct restoration with light cure dental composite to fulfill the esthetic and functional requirements of the patient, and would subsequently be replaced by permanent indirect restoration once maturity is attained and stable contact points are established. However the labially bent crown offered a considerable challenge to gain access to the root canal space. Therefore, it was decided to remove the labially projected portion of the crown and attain straight line access from the incisal aspect and reinforce the compromised retention with post and core. Local anesthesia (lidocaine with 1:100,000 epinephrine) was administered and the labially projected portion of the crown was removed using straight fissure bur. The tooth was isolated and access cavity was prepared as decided using taper fissure bur. Root canal space was explored with a #15 K-file. Working

length was determined using electronic apex locator and was later confirmed with digital radiography.

Cleaning and shaping was done with rotary Hyflex edm (single file system) with copious irrigation of 1.5% NaOCl. Root Canal space was dried and non setting calcium hydroxide was placed for about 2 weeks. Obturation was carried out using matching gutta percha and endodontic sealer. Patient was recalled for definitive restoration after 2 days. Endo post was placed and the tooth restored with direct composite restoration. Finishing and polishing along with occlusal adjustment was done.

After one month, on follow-up the tooth was clinically intact with no mobility(Fig 3). No tenderness was elicited on palpation or percussion. Periodontium

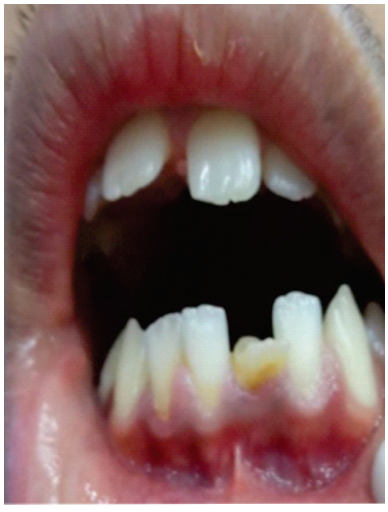

Fig 1: Preoperative photograph

Fig 2: Preoperative radiograph

Fig 3: Postoperative radiograph

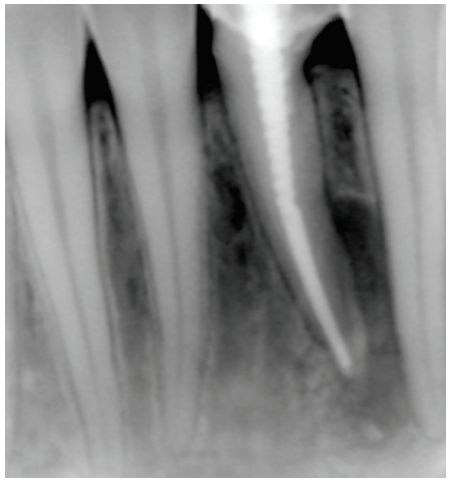

Fig 4: Postoperative photograph

was healthy. Periapical radiolucency appeared to be diminishing(Fig 4).

DISCUSSION

Dilaceration is a rarely occurring phenomenon in mandibular incisors. It is relatively more common in maxilla because of its susceptibility to traumatic injury and the close proximity of the developing tooth germ to

primary teeth[7]. Only a few cases of dilacerated mandibular incisors have been reported in the dental literature so far. The case presented here is a sequel to intrusive injury to a primary mandibular incisor that had occurred when the child was only two years old. Dilacerations happen when trauma to the primary teeth occurs at a time when a part of the tooth has calcified and due to the impact of traumatic force it is displaced from the long axis of the developing tooth. In the current case, despite the fact that there was no evidence of dental caries or any other apparent etiologic factor the tooth was non vital. This finding is consistent with the study of von Gool; who found that all dilacerated teeth in his study were non vital without any obvious reason. [8] Nasry and Barclay claim that occlusal trauma due to misalignment of teeth is responsible for the pulpal and periodontal diseases. According to some studies, it is the defective enamel that allows microorganisms to invade the pulp space culminating in necrosis of the pulp. In some cases incomplete root formation was observed which is believed to be caused by pulpal necrosis occurring before the root formation has completed.[9]

The dilacerated tooth presented here has erupted normally. However it is quite common for such teeth to erupt abnormally into an ectopic position lingually or labially, or remain partially or completely unerupted depending upon the severity of the condition. More invasive and multidisciplinary treatment options should be considered including orthodontic and surgical interventions. Radiographic examination is important for diagnosis, treatment planning and endodontic management. Digital radiography and radiographs taken at different angles would greatly help in identifying variations in tooth morphology. However the information provided by these 2-D images is limited and CBCT is a good alternative for providing more detailed information in complex cases[10]. Endodontists may encounter difficulties while performing root canal treatment in dilacerated teeth. These may include difficult access due to angulations between the crown and root, aberrant root canal system, incomplete root formation and root resorption[11]. In this case the coronal portion of the tooth was at right angle to the radicular portion. Hence creating straight-line access with the crown intact was not possible. It was decided to remove the coronal portion first and then gain straight-line access to the root canal space.

CONCLUSION

To avoid future complications in developing permanent teeth, traumatic injuries to deciduous dentition need regular follow up. Proper diagnosis and meticulous treatment planning is required to achieve desirable esthetic and function.

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CONTRIBUTIONS BY AUTHORS

1	**Mohib Ullah:**	Planned and executed all the steps of conserving the tooth from initial diagnosis to final obturation and later postoperative follow up along with the literature and script organization of the case report.
2	**Nadeem Rana:**	Being Head of department, overall supervised and monitored the case treatment and critically reviewed various stages of treatment and composition of the case report along with the final light cure restoration of the affected tooth.
3	**Amjad Naeem:**	Being treating orthodontist of the case, initially diagnosed the case with referral to operative department later coordinated and remained involved in all steps of treatment, follow up and literature composition. He is now further carrying out orthodontic management of the case.
4	**Kanza Iqbal:**	Being Resident in operative dentistry, coordinated and followed the entire case with patient counseling, appointment arrangements, literature collection and initial organization, in addition to clinically assisting the clinical chair side procedures.