MANAGEMENT OF EXTRUSION AND LATERAL LUXATION OF ANTERIOR PERMANENT TEETH – A CASE REPORT

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Abstract
Background: Almost half of all traumatic dental injuries accounts for luxation and involves mostly maxillary incisors during childhood and adolescence. The response of dental pulp to traumatic luxation injuries can be survival, calcification or necrosis, which depends on the severity, type of injury along with the developmental stage of the tooth.
Methods: A 12 year old boy sustained traumatic lateral luxation and extrusion injuries of different types to his maxillary permanent incisors that were repositioned and stabilized for 1 month and managed without endodontic intervention.
Findings: The assessment was carried at the end of the follow-up period revealed continued root growth and apical development along the absence of pulpal and periapical disease and retention of the maxillary incisors in a state of health and normal function.
Conclusion: To determine the progress and prognosis of pulpal healing for traumatically luxated teeth, careful and continual assessment becomes imperative.

Keywords: Traumatic dental injuries, lateral luxation, extrusion

Introduction

The displacement of the tooth during a direction aside from axial, which is amid comminution or fracture of the alveolar socket is lateral luxation.[1,2] Lateral luxation is one among the most prevalent dental injuries among the general population, resulting in up to 27% of all dental wounds.[3] Considering the etiology of the condition, 14% of all dental luxation injuries occur during physical activities.

Luxation injuries is subdivided into 5 types as per the World Health Organization classification of traumatic dental injuries: concussions, subluxations and extrusive, intrusive and lateral luxations.[4] Of all the traumatic injuries to permanent teeth, approximately 55% comprises luxation injuries, predominantly occur during 6 to 16 years of age and overwhelmingly affect the maxillary incisors.[5-10]

The response of dental pulp to tooth luxation leads to three possibilities: survival, calcification or necrosis, which further depends upon the severity and type of injury and the stage of tooth development. Pulp survival is maintained very well if there is mild to moderate luxation injuries (concussions and subluxations), whereas with severe luxation injuries (extrusive, intrusive and lateral luxations) pulp necrosis is a frequent occurrence. However, the dental pulps of severely luxated immature teeth have a higher rate of survival than those of mature teeth. [11-15]

Pulp necrosis occurred in 3% of concussions, 6% of subluxations, 26% of extrusive luxations, 58% of lateral luxations and 85% of intrusive luxations in an investigation of the prognosis of 637 luxated permanent teeth. However the differences within the occurrence of pulp necrosis among mature versus immature teeth were respectively; 4% to 0% for concussions, 15% to 0% for subluxations, 64% to 9% for extrusive luxations, 77% to 9% for lateral luxations and 100% to 65% for intrusive luxations.[16]

Traumatic injury mainly caused by forces with oblique direction is extrusive luxation, characterized by the partial or total separation of periodontal attachments. The loosening and axial displacement of the tooth is expected after the

traumatic dental injury. This elongated tooth, also called "partial avulsion," is threatened by loss of vascular supply and pulp vitality. The patient complains of pain during mastication in dental traumatic injuries. A space round the apices of the extruded tooth is seen radiographically. The periodontal ligament, the tissue that connects the tooth to its socket, is usually torn within the case of an extrusion. An extruded tooth would appear to possess more room between the tooth and its socket inside the gumUpon radiographic examination.[17-19]

The guidelines for the management of luxated permanent teeth depend on the type and severity of the injury and the stage of tooth development at the time of injury. Generally, if there is a higher incidence of pulp necrosis due to pulpal ischemia early pulp removal for severely luxated mature teeth is recommended, and for severely luxated immature teeth where there is a lower incidence of pulp necrosis due to the presence of a rich vascular blood supply to the pulp through a wide open apical foramen which helps in maintaining pulpal circulation it is often advised to retain the pulp.

The aim of this article is to introduce the report of a patient who suffered from both intrusion and lateral luxation in the maxillary anterior teeth.

Case Report

A 12 year old boy cameto Christian Medical College Ludhiana, Punjab (India) with a chief complaint of mobile upper front teeth after 2 hours of road accident. It had resulted in the extrusion of the upper right central incisor and lateral luxation of the upper right lateral incisor.IOPA # 11, 21 revealed extrusion of 11 and lateral luxation of #21

Oral bleeding was present. There was no history of loss of consciousness, no history of seizures, no history of ear bleeding, and no history of nasal bleeding.

A diagnosis of extrusion w.r.t 11 and lateral luxation w.r.t 21 was established and replantation procedure was thus planned. Repositioning was done in the socket w.r.t 11 and slight repositioning was done w.r.t 21. Semi rigid splinting was placed 13 to 23. Splint was removed after 3 weeks and patient was followed up to 1 year.

Figure 1: REPOSITIONING AND SPLINTING

Figure 2: Periapical x-ray. Extrusion of tooth#11 and lateral luxation of tooth #21

Figure 3: Post-operative photograph after one month follow-up

Discussion

The school children are more prone to dental traumatic injuries (TDIs)accounting for 5% of all accidental injuries. An accuratediagnosis, treatment plan, and regularly arranged monitoring appointments is the key to ensure a successful outcome.[20]

Combination of several injuries usually affects the teeth. The main purpose of the available guidelines is to improve the management of injured teeth and lessentrauma-related complications which include the maintenance of the periodontium, soft tissue injuries and repositioning of luxated teeth before any endodontic procedures.

To allow physiological movements, short-term, passive, and flexible splints for luxated, avulsed, and root-fractured teeth are recommended. Thecomposite resin and bonding agents should be kept away from the gingival tissues and proximal areas to ensure maximum healing and avoid plaque retention. There is limited evidence to support the use of antibiotics, mainly at the clinician's discretion in the case of soft tissue and other associated injuries.[20,21]

Pulp canal obliteration, root resorption, and loss of marginal attachment are few complications that might occur after trauma.[22] The determinative factors in the prognosis of luxated teeth are degree of displacement, delay in treatment, root maturation, and concomitant crown and root fractures are among.[23]

Manipulation is done under local anesthesia using the thumb and the index finger as the lateral luxation is usually associated with fracture of alveolar socket. The laterally luxated tooth should be repositioned first by forcing the displaced apex out of its locked position within the labial bone and thereafter axial pressure is applied in apical direction to guide the tooth into its natural position.

Splinting is required routinely after reduction of lateral luxation injuries.[24]The period of splinting should be decided by the clinician based on the extent of alveolar fracture and mobility of injured tooth with follow-up appointment every two weeks.[25] Andreason[24]has recommended three to four weeks splinting period for luxation injuries associated with alveolar socket wall fracture.

The case mentioned above had extrusion w.r.t. 11 and lateral luxation w.r.t 21 and in which repositioning was done in the socket w.r.t 11 and slight repositioning was done w.r.t 21. Semi rigid splinting was placed 13 to 23. Splint was removed after 3 weeks. The observation was done every one month till one year follow-up.

Since there is 77% chance of pulp necrosis in case of luxation injuries, it is imperative to test the luxated teeth regularly for pulp vitality,. Radiographs should be taken regularly to rule out ankylosis, marginal bone loss and root resorption as high incidence has been observed.[22]Immediate endodontic treatment with several calcium hydroxide dressings in between is the treatment modality for the teeth that develop inflammatory resorption.[24]

Conclusion

As a result of timely intervention, the present case report shows a favorable and stable outcome with a one-year follow-up. The high prevalence of traumatic events affecting the anterior teeth has a significant impact on self-confidence as well as quality of life.Professional knowledge and experience, accuracy, and regular follow-up sessionsis required for successful treatment of these accidents.The patient of age group between 10-20yrs are undergoing pubertal changes, thus it is important to consider the emotional aspect of their life.Clinical and radiographic signs of pulpal and periapical inflammatory pathosis demands endodontic intervention of the affected tooth.

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